

University of Rajshahi

Rajshahi-6205

Bangladesh.

RUCL Institutional Repository

<http://rulrepository.ru.ac.bd>

Institute of Bangladesh Studies (IBS)

PhD thesis

2021

Inquest of Sustainable Development: Regulatory Framework of Upstream Operation of Natural Gas in Bangladesh

Khatun, Mst. Momotaz

University of Rajshahi

<http://rulrepository.ru.ac.bd/handle/123456789/1029>

Copyright to the University of Rajshahi. All rights reserved. Downloaded from RUCL Institutional Repository.

**INQUEST OF SUSTAINABLE DEVELOPMENT: REGULATORY
FRAMEWORK OF UPSTREAM OPERATION OF NATURAL GAS
IN BANGLADESH**



A Thesis Submitted to the Institute of Bangladesh Studies, University
of Rajshahi, Rajshahi, Bangladesh for the Degree of Doctor of
Philosophy

By
Mst. Momotaz Khatun
PhD Fellow (2016-2017)
Institute of Bangladesh Studies (IBS)
University of Rajshahi

**Inquest of Sustainable Development: Regulatory Framework of
Upstream Operation of Natural Gas in Bangladesh**

A Thesis Submitted to the Institute of Bangladesh Studies, University
of Rajshahi, Rajshahi, Bangladesh for the Degree of Doctor of
Philosophy

Researcher

Mst. Momotaz Khatun

PhD Researcher ID No. 1713183906

Session 2016-2017

Institute of Bangladesh Studies

University of Rajshahi

Supervisor

Prof. Abu Naser Md. Wahid

Department of Law

University of Rajshahi



**Institute of Bangladesh Studies
University of Rajshahi, Bangladesh**

March, 2021

DECLARATION

I do hereby declare that the dissertation entitled INQUEST FOR SUSTAINABLE DEVELOPMENT: REGULATORY FRAMEWORK OF UPSTREAM OPERATION OF NATURAL GAS IN BANGLADESH submitted to the Institute of Bangladesh Studies, University of Rajshahi as a part of the requirement for the degree of Doctor of Philosophy in Law. Neither the whole nor any part of it was submitted to any other university or institute for any other degree or diploma. My indebtedness to other works has duly been acknowledged at the relevant places.

Mst. Momotaz Khatun
PhD Researcher
Institute of Bangladesh Studies
University of Rajshahi

CERTIFICATE

I have great pleasure to certify that the dissertation entitled INQUEST FOR SUSTAINABLE DEVELOPMENT: REGULATORY FRAMEWORK OF UPSTREAM OPERATION OF NATURAL GAS IN BANGLADESH submitted by Mst. Momotaz Khatun to the Institute of Bangladesh Studies, University of Rajshahi, Bangladesh for the Degree of Doctor of Philosophy in Law is an original research work done under my supervision and guidance respectively. To the best of my knowledge, this dissertation was not previously submitted for any diploma, degree, fellowship to any other university/Institute. Study related materials, data collected from different sources have been duly acknowledged in this thesis.

Professor Abu Naser Md. Wahid
Department of Law
University of Rajshahi, Bangladesh

PAPERS PUBLISHED FROM THE THESIS

Mst. Momotaz Khatun, “Assessing Legal and Institutional Framework for Natural Gas Extraction in Bangladesh,” *Rajshahi University Law Review* 10 (2019): 164-189.

Mst. Momotaz Khatun, “Natural Gas Extraction in Bangladesh and the Sustainable Development Issues,” *Journal of the Institute of Bangladesh Studies* (Accepted for Publication)

ACKNOWLEDGMENT

All praises belong to Almighty Allah, the most merciful, the most beneficent and the most kind for giving me the opportunity, courage and enough energy to carry out and complete the entire thesis work.

My first and foremost thanks go to Professor A.N.M. Wahid, my supervisor, for his constant support, intellectual guidance, encouragement and cooperation throughout my study. His efforts of mentoring, correcting, commenting and suggesting on the draft chapters were really helpful to improve the quality of my thesis. Thank you very much sir, for directing me the way “how to learn”.

I am pleased to express my thanks to Prof. Dr. Zakir Hoasain, Director, Institute of Bangladesh Studies for his intellectual support and kind cooperation. My sincere thanks to all my honorable teachers of IBS for their continuous encouragement and support at all levels.

I would like to thank Prof. Dr. M. Anisur Rahman for his invaluable comments and suggestions. I would like to thank to Prof. Dr Biswajeet Chanda and .Dr. Nasrin Rahman, for their sincere cooperation at different stages of my work. I also like to thank my respected teachers and colleagues of Department of Law at the University of Rajshahi.

My sincere thanks go to Prof. Abdullah Al Faruque, Prof. M. Hashibul Alam Prodhan, Mr. Abu Hena Md. Rahmatul Muneem, Chairman, NBR Bangladesh, Prof. M.Tamim, Prof. Anu Muhammad Anisur Rahman, Prof. Badrul Imam, Prof. Ainun Nishat, Prof. Salim Mahud, Prof. Shamsul Alam, Prof. Nurul Islam, Mr. Md Shanewaz Pervez and Mr. Rahman Murshid, for their helpful comments, suggestions and cooperation. I am thankful to all the officers and staffs of IBS for their cooperation.

I am grateful to my parents and siblings who made a positive impact in my life and thus indirectly contributed to the completion of this work.

I am very grateful to my husband N.H.M. Kamrujjaman Serker whose continuous support and cooperation is unfailing during my entire study period. To my lovely daughters Serker Fabia Jaman (Sora) and Serker Lamiya Jaman (Nora), who missed a lot their mother when I was busy with the study. This work is dedicated to you. It should inspire you to become better persons in your future careers.

Mst. Momotaz Khatun

PhD Fellow (2016-2017)

Institute of Bangladesh Studies, University of Rajshahi

ABSTRACT

Natural gas has been playing a very important role in the economy of Bangladesh since the early 1960s. It has been the principal fuel and raw material for many industries in the country for a relatively long time due to its affordable price and widespread use. International Oil Companies (IOCs) and Bangladesh Petroleum Exploration and Production Company Limited (BAPEX) are involved in the exploration and production of natural gas in Bangladesh.

Exploration and production of petroleum involve great financial and technical challenges, and IOCs usually dominate international petroleum activity. One of the challenges for any petroleum-producing country is to accommodate the interests of the State against the objectives of the international oil companies. Extraction of any petroleum resource creates the demand for effective and sustainable extraction along with protection of the environment. Therefore, establishing an appropriate legal framework with regulatory and administrative institutions is essential to secure the sustainable development of the petroleum resources to ensure the benefit for current and future generations. This study explores the explicit usage and interpretations of the concept of “sustainable development” in the laws of Bangladesh related to petroleum operation and to explain how the international concept is being viewed and treated through the domestic legal framework. Bangladesh mainly produces natural gas as petroleum, and in this thesis, natural gas is interchangeably used with petroleum.

The legal concepts, issues and problems underlying the sustainable extraction of natural gas in Bangladesh are analysed in this study in their practical sense and functional context. The study mainly incorporates the analytical methodology with a comparative approach as a method.

The study adopts the triple bottom line approach of the Brundtland Commission’s definition of sustainable development in the oil and gas industry, namely economic growth, environmental stewardship and social progress. After analysing several instruments for measuring sustainable development of mining and petroleum resources, this study had selected six indices to explore how far the sustainable development concept is articulated in the development of petroleum resources. The selected indices are regulatory framework, environmental management, community consultation and public participation, access to

information and good governance, conservation for future generation and cost-benefit analysis.

Based on the selected indices, this study critically examines relevant policies, laws and contracts in every steps of the petroleum operation in Bangladesh and finds out that the policies, laws and model production sharing contract governing the petroleum sector of Bangladesh are not well articulated with the concept of sustainable exploration and production of this valuable resource. The study also finds that institutional capacity and legal and institutional framework are inadequate, management is weak, and the environmental impact assessment process and the overall monitoring system are imperfect. It is noteworthy to mention that the findings from document analysis and from the key informant interview are in good agreement.

The study observes that for proper environmental management, the integration of social and environmental concern of the petroleum operation, consultation with key stakeholders, and emphasis on transparency and accountability are necessary. To attain this, a comprehensive law is needed to be enacted. The confidentiality clause in Model Production Sharing Contract should be abolished. National oil company BAPEX needs to be strengthened. Regulatory reform, updating the petroleum policy, enactment of new laws, amendment of existing laws and increasing the institutional capacity with well-defined regulatory authorities are essential to meet sustainable development of natural gas operation in Bangladesh.

LIST OF FIGURES

- Figure 2.1 The hierarchy structure of Key Performance Indicators
- Figure 3.1 Hierarchy in a regulatory Framework of petroleum operation
- Figure 3.2 Organisational structure of energy sector in Bangladesh
- Figure 4.1 PSC block map of Bangladesh
- Figure 4.2 Current petroleum block map of Bangladesh

LIST OF TABLES

Table 1.1 Details of Interview

Table 4.1 Summary of the bidding of gas blocks in Bangladesh

Table 4.2 Description of the studied contract

Table 4.3 Comparison among model production sharing contracts in Bangladesh

LIST OF ABBREVIATIONS

ACC	Anti Corruption Commission
API	The American Petroleum Institute
ASTM	American Society for Testing and Materials
BAT	Best Available Technologies
BCF	Billion Cubic Feet
BDT	Bangladesh Taka
BELA	Bangladesh Environmental Lawyers Association
BET	Best Environmental Practices
BAPEX	Bangladesh Petroleum Exploration and Production Company Limited
BECA	Bangladesh Environment Conservation Act
BERC	Bangladesh Energy Regulatory Commission
BMDC	Bangladesh Mineral Development Corporation
BMOGC	Bangladesh Mineral, Oil and Gas Corporation
BOC	Burma Oil Company
BOGC	Bangladesh Oil and Gas Corporation
BOGMC	Bangladesh Oil Gas and Mineral Corporation
BP	British Petroleum
BPI	Bangladesh Petroleum Institute
BPC	Bangladesh Petroleum Corporation
CBD	Convention on Biological Diversity
CFT	Cubic feet
DoE	Department of Environment
EC	European Commission

ECC	Environment Clearance Certificate
ECR	Environmental Conservation Rules
EFTA	European Free Trade Association
EIA	Environmental Impact Assessment
EITI	Extractive Industries Transparency Initiative
EMP	Environment Management Plan
EMP	Environmental Monitoring Programme
FBI	Federal Bureau of Investigation
GDP	Gross Domestic Product
GIIP	Gas Initially in Place
GIPIP	Good International Petroleum Industry Practice
GO	Government Official
GPSA	Gas Purchase and Sale Agreement
ICSID	International Centre for Settlement of Investment Dispute
IDA	International Development Association
IEE	Initial Environmental Examination
ILA	International Law Association
IOC	International Oil Company
IPIECA	The Global Oil and Gas Industry Association for Advancing Environmental and Social Performance
IFC	International Finance Corporation
ITLOS	International Tribunal for the Law of the Sea

IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
JMC	Joint Management Committee
JVA	Joint Venture Agreement
KEAL	Kris Energy (Asia) Ltd.
LNG	Liquefied Natural Gas
MDGs	Millennium Development Goals
MMCFD	Million Cubic Feet Per Day
MMSD	Mining Minerals and Sustainable Development
MNC	Multi National Corporation
MoPEMR	Ministry of Power, Energy and Mineral Resources
MOEX	Mitsui Oil Exploration
MP	Member of Parliament
MPSC	Model Production Sharing Contract
NBSAP	National Biodiversity Strategy and Action Plan 2016-2021
NEMAP	National Environmental Management Action Plan
NGO	Non-Governmental Organisation
EPA	Environmental Protection Agency
NOC	National Oil Company
NOC	No Objection Certificate.
NRGI	Natural Resource Governance Institute
OECD	The Organisation for Economic Co-operation and Development

OPEC	Organisation of the Petroleum Exporting Countries
OGDC	Oil and Gas Development Corporation
PGI	Petroleum Governance Initiatives
PSC	Production Sharing Contract
RCMP	Royal Canadian Mounted Police
SD	Sustainable Development
SDG	Sustainable Development Goal
SEA	Social Environment Assessment
SIA	Social Impact Assessment
SPE	Society of Petroleum Engineers
SSFL	Santos Sangu Field Ltd.
TCF	Trillion Cubic Feet
TOE	Tons of Oil Equivalent
ToR	Term of Reference
UN	United Nations
<i>UNCCUR</i>	United Nations Conference on the Conservation and Utilization of Resources
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Commission on Sustainable Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNCAC	United Nations Convention on Anti Corruption

UNFCCC	United Nations Framework Convention on Climate Change
UNCHE	United Nations Conference on Human Environment
UNHCHR	United Nations High Commissioner for Human Rights
USA	United States of America
WWF	World Wide Fund for Nature

TABLE OF LEGISLATIONS AND INTERNATIONAL CONVENTIONS

Legislation

Bangladesh National Biodiversity Strategy and Action Plan (NBSAP) 2004
Bangladesh Water Act 2013
Draft Clean Air Act 2018
Gas Sector Master Plan Bangladesh 2017
Model Production Sharing Contract 1988
Model Production Sharing Contract 1997
Model Production Sharing Contract 2008
Model Production Sharing Contract 2012
Model Production Sharing Contract 2019
National Energy Policy 2004
National Water Policy 1999
Noise Pollution (Control) Rule 2006
Petroleum Act 2016
Petroleum Policy 1993
The Bangladesh Biodiversity Act 2017
The Bangladesh Environment Conservation Act 1995
The Bangladesh Gas Act 2010
The Gas Development Fund Policy 2012
The Bangladesh Oil, Gas and Mineral Corporation Ordinance, 1985
The Bangladesh Petroleum Act 1974
The Constitution of the People's Republic of Bangladesh
The Environment Conservation Rules (ECR) 1997
The Medical Waste (Management and Processing) Rules 2008
The Mines Act 1923
The National Environmental Management Action Plan, 1995
The Pakistan Petroleum (Production) Rules 1949
The Petroleum Act 1934
The Petroleum Rules 1937
The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948
The Speedy supply of Power and Energy (Special Provision) Act 2010

The Water Pollution Ordinance 1970

Convension

Amazonian Treaty of 1978

Conference International Law Association, New Delhi, 2002

Conservation Convention, Antarctic Seals Convention 1972

Convention on Biological Diversity (CBD)

Convention on International Trade on Endanger Species of Wild Fauna and Flora (CITES)
1973,

Convention on the Conservation of Migratory Species of the Wild Animals (CMS) 1979

Convention on the Protection of the World Cultural and Natural Heritage 1972

Danube Fisheries Convention 1958

Framework Convention on Climate Change 1992

General Fisheries Council for Mediterranean 1949

North Atlantic Fisheries Convention 1959

The Johannesburg Summit 2002

The Latin American Forest Institute's agreement in 1959

The United Nations Conference on the Human Environment 1972

The Ramsar Convention 1971

UN Conference on the Environment and Development 1992

United Nations Conference on Conservation and Utilisation of Resources 1949

Western Hemisphere Convention 1940

Whaling Convention 1946

CONTENTS

DECLARATION	ii
CERTIFICATE	iii
PAPERS PUBLISHED FROM THE THESIS	iv
ACKNOWLEDGEMENT	v
ABSTRACT	vi
LIST OF FIGURES	viii
LIST OF TABLES	ix
LIST OF ABBREVIATIONS	x
LIST OF LEGISLATIONS AND INTERNATIONAL CONVENTIONS	xv
CONTENTS	xvii
1. Introduction	1
1.1 Importance of Natural Gas in Bangladesh	1
1.2 Statement of Problem.....	4
1.3 Natural Gas Resource of Bangladesh.....	8
1.4 Regulatory Organisations of Petroleum Resources in Bangladesh.....	10
1.5 Sustainable Development Concept in the Oil and Gas Sector.....	12
1.6 Literature Review	13
1.7 Rationale of the Study.....	20
1.8 Research Questions.....	21
1.9 Research Objectives	21
1.10 Methodology	22
1.10.1 Research Approach.....	22
1.10.1.1 Analytical Approach.....	23
1.10.1.2 Comparative Method.....	23
1.11 Sources of Data	23
1.11.1 Interview.....	24
1.11.1.1 Key Informant Interviews.....	24
1.11.2 Case Studies.....	25
1.11.3 Document Analysis.....	25
1.12 Data Collection Method.....	26
1.12.1 Academician	26
1.12.2 Energy Expert.....	26

1.12.3	Government Official	27
1.12.4	Environment Expert	27
1.12.5	Petroleum Engineers	27
1.13	Data Analysis Method	28
1.14	Limitations	29
1.15	Thesis Structure.....	29
2.	Natural Gas Extraction and the Concept of Sustainable Development.....	31
2.1	Introduction.....	31
2.2	Evolution of the Concept of Sustainable Development	32
2.3	Development of the Concept of Sustainable Development.....	35
2.3.1	United Nations Conference on the Human Environment 1972.....	36
2.3.2	Brundtland Commission on Environment and Development.....	37
2.3.3	The United Nations Conference on the Environment and Development 1992.	39
2.3.4	The Johannesburg Summit 2002.....	44
2.4	Conceptual Basis of Sustainable Development.....	45
2.5	Sustainable Development Law.....	47
2.6	Principles of International Law of Sustainable Development.....	48
2.6.1	Sustainable Use of Natural Resources.....	48
2.6.2	Principle of Equity: Inter-generational and Intra-generational.....	49
2.6.3	Common but Differentiated Responsibilities.....	50
2.6.4	The Precautionary Approach to Human Health, Natural Resources and Ecosystems.....	51
2.6.5	The Principle of Public participation and Access to Information and Justice	51
2.6.6	Principle of Good Governance.....	52
2.6.7	The Principle of Integration and Interrelationship in Relation to Human Rights and Social, Economic and Environmental Objectives.....	52
2.6.8	Polluter Pays Principle.....	53
2.7	The Relation of Natural Gas Extraction and Sustainable Development.....	54
2.7.1	Berlin Guidelines.....	58
2.7.1.1	Mining and Sustainable Development.....	58
2.7.1.2	Regulatory Frameworks.....	59
2.7.1.3	Environmental Management.....	59
2.7.1.4	Community Consultation and Development.....	61
2.7.1.5	Voluntary Undertakings.....	61

2.7.1.6	Access to Information.....	62
2.7.2	Petroleum Governance Initiatives (PGI).....	63
2.7.2.1	Legal, Regulatory, and Contractual Framework.....	63
2.7.2.2	Institutional Strengthening for Good Governance.....	64
2.7.2.3	Public Consultation and Access to Information.....	64
2.7.2.4	Environmental Assessment Process.....	64
2.7.2.5	Decommissioning and Liability.....	64
2.7.2.6	Private Sector Involvement in Good Environmental Practice.....	65
2.7.3	Standard for Sustainable Mineral Development.....	65
2.7.4	Key Performance Indicator for Sustainable Production of Petroleum.....	67
2.8	Indexes of Sustainable Natural Gas Operation.....	69
2.8.1	Regulatory Framework.....	69
2.8.2	Environmental Management.....	72
2.8.3	Community Consultation and Public Participation.....	73
2.8.4	Access to Information and Good Governance.....	74
2.8.5	Conservation for Future Generation.....	76
2.8.6	Cost Benefit Analysis.....	77
2.9	The Sustainable Development Goals (SDGs) and their Importance in the Oil and Gas Industry.....	79
2.10	Conclusion.....	81
3.	Existing Legal Structure of Natural Gas Exploration in Bangladesh	83
3.1	Introduction.....	83
3.2	Current Regulatory Framework	84
3.2.1	Constitution of the People’s Republic of Bangladesh	86
3.2.2	The Policy Framework.....	88
3.2.2.1	Petroleum Policy 1993.....	88
3.2.2.2	The National Energy Policy 2004	90
3.2.2.3	Gas Sector Master Plan 2017 (GSMP 2017)	93
3.3	The Legislative Framework	96
3.3.1	The Mines Act 1923	96
3.3.2	The Petroleum Act 1934	97
3.3.3	The Petroleum Rules 1937	98
3.3.4	The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948.....	99

3.3.5	The Pakistan Petroleum (Production) Rules 1949	100
3.3.6	The Bangladesh Petroleum Act 1974.....	101
3.3.7	The Bangladesh Oil, Gas and Mineral Corporation Ordinance 1985	104
3.3.8	The Bangladesh Gas Act 2010	106
3.3.9	The Speedy Supply of Power and Energy (Special Provision) Act 2010	106
3.3.10	Gas Development Fund Policy 2012.....	108
3.3.11	The Petroleum Act 2016	109
3.4	Institutional Structure	109
3.4.1	Ministry of Power, Energy and Mineral Resources (MoPEMR).....	111
3.4.1.1	Hydrocarbon Unit	112
3.4.1.2	Geological Survey of Bangladesh	112
3.4.1.3	Bureau of Mineral Development	113
3.4.1.4	Department of Explosive	113
3.4.1.5	Bangladesh Petroleum Institute	113
3.4.1.6	Bangladesh Petroleum Corporation	113
3.4.1.7	Bangladesh Oil, Gas and Mineral Corporation (Petrobangla) ...	113
3.5	Natural Gas Extraction and Laws on Sustainable Development of Bangladesh...	116
3.5.1	The National Environment Policy 2018	117
3.5.2	The Bangladesh Environment Conservation Act 1995.....	119
3.5.3	The Environment Conservation Rules (ECR) 1997	122
3.5.4	The Water Management Laws.....	125
3.5.5	Waste Management System	128
3.5.6	Noise Pollution Control Mechanism	129
3.5.7	Air Pollution in Petroleum Industry	130
3.5.8	Conservation of Biodiversity	132
3.5.9	The Wetland Management System of Bangladesh	135
3.5.10	Soil Pollution Management	136
3.6	Conclusion	136
4.	Model Production Sharing Contract: A Case Study of Bangladesh	139
4.1	Introduction	139
4.1.1	Concession	140
4.1.2	Production Sharing Contract	141
4.1.3	Service Contract	142
4.1.4	Joint Venture	142

4.2 Contractual Agreement in Bangladesh.....	142
4.3 Model Production Sharing Contract in Bangladesh	148
4.3.1 Interest of the State	150
4.3.2 Environmental Management	159
4.3.2.1 Magurchara Blowout.....	162
4.3.2.2 Tengratila Blowout	167
4.3.2.3 Abandonment	177
4.3.3 Employment, Training and Transfer of Technology	178
4.3.4 Confidentiality.....	180
4.3.5 Cost Recovery	181
4.3.6 Codes of Conduct.....	183
4.3.7 Bonuses and Fees.....	186
4.4 The Comparison among the Model Production Sharing Contracts of Bangladesh	187
4.5 Conclusion.....	198
Chapter Five Compliance with International Environmental Commitments	202
5.1 Introduction	202
5.2 Standards to Comply the Sustainable Natural Gas Operation	203
5.2.1 Perception on Sustainable Development Principles in Oil or Gas Development.....	203
5.2.1.1 Development of National Expertise.....	204
5.2.1.2 Prohibition of Export.	205
5.2.1.3 Social Equity	205
5.3 Regulatory Framework	206
5.3.1 Regulatory Practices and Sustainable Development	207
5.3.2 Institutional Capacity and Sustainable Development	209
5.3.3 Separation of the Regulatory Institution and Commercial Interests.....	210
5.4 Environmental Management.....	211
5.4.1 Initial Environment Examination (IEE)	212
5.4.2 Environmental Impact Assessment (EIA)	213
5.4.3 Social Impact Assessment (SIA).....	220
5.4.4 Environmental Monitoring Programme	222
5.4.5 Decommission and Abandonment.....	223
5.5 Community Consultation and Public Participation	229
5.6 Access to Information and Good Governance	234

5.6.1 Availability of Information	240
5.6.2 Transparency	241
5.6.3 Accountability	242
5.7 Cost Benefit Analysis	244
5.7.1 Economic Cost Benefit Analysis	246
5.7.2 Environmental Cost Benefit Analysis	247
5.8 Conservation for Future Generation	248
5.9 Conclusion	253
6. Conclusion and Suggestion	255
6.1 Summary.....	255
6.2 Conclusions.....	256
6.2.1. Petroleum Policy	257
6.2.2. Legislative Framework	258
6.2.3 Contractual Framework	258
6.2.4. Institutional Capacity	259
6.2.5 Protection of Environment	260
6.2.6 Access to Information and Transparency	261
6.2.7 Rate of Recovery	261
6.2.8 State’s Participation	262
6.2.9 Community Consultation	262
6.3 Suggestions	262
6.3.1 Recommendations for Policy, Legislative and Regulatory Reform	263
6.3.2 Suggestion for Further Study.....	264
Bibliography.....	266
Appendices.....	287

CHAPTER ONE

INTRODUCTION

The aim of this Chapter is to introduce the research problem and rationale of the study, to demonstrate the research methods utilised for the study, and to indicate briefly the outline of the thesis. Review of existing literatures pertaining to the petroleum operation in Bangladesh are also summarised in this chapter.

1.1 IMPORTANCE OF NATURAL GAS IN BANGLADESH

Natural gas is the primary source of energy in Bangladesh. Besides electricity generation, it is also used for fertiliser production, household cooking, industrial process heating, and as fuel in various vehicles. Natural gas is closely connected with the swiftly growing economy of Bangladesh. The country has achieved more than 7% GDP for the last few years and in 2019 the GDP was a record over 8%.¹ Besides, Bangladesh has met the challenges of Millennium Development Goals (MDG) and is known as the role model for achieving the MDGs.² Natural gas has become an integral part of the Bangladeshi economy. Gas is by far the leading fuel for electric power generation as well as the most cost-competitive option. Natural gas accounted for about 58% of electricity generation in 2018-19.³ Bangladesh has also developed gas-intensive industries such as fertiliser which is highly subsidised to ensure food security.

In 2015, Bangladesh became a member of the lower-middle-income countries while in 2018, Bangladesh successfully accomplished all eligibility criteria to be recognised as a ‘developing country’.⁴ The country has aimed at achieving the permanent status of a developing country, and go on to gaining the status of a developed country by 2041.⁵ Sustainable economic growth and the ambition for economic development have created an

¹ “Economic Indicators for Bangladesh,” Asian Development Bank <https://www.adb.org/countries/bangladesh/economy>, accessed on August 8, 2020.

² “Bangladesh’s Progress on the MDGs,” <http://www.bd.undp.org/content/bangladesh/en/home/post-2015/millennium-development-goals.html> accessed on January 10, 2017.

³ Power Division, “Annual Report,” Ministry of Power, Energy and Mineral Resources, Bangladesh, https://powerdivision.gov.bd/sites/default/files/files/powerdivision.portal.gov.bd/annual_reports, accessed on October 10, 2020.

⁴ “The World Bank in Bangladesh” <https://www.worldbank.org/en/country/bangladesh/overview>, accessed on August 3, 2020.

⁵ “Bangladesh Eligible for UN ‘Developing Country’ Status,” <https://bdnews24.com/bangladesh/2018/03/17/bangladesh-eligible-for-un-developing-country-status> accessed on August 3, 2020.

increased demand for energy. Primary energy consumption reached 24.3 Mtoe⁶ in 2011 which was 12.7 Mtoe in 2000.⁷ However, per capita electricity consumption in the country is 212 kWh⁸, which is one of the lowest compared to that of other developing countries like India (480.5 kWh) and Pakistan (456.2 kWh).⁹ Per capita energy consumption is also a measure of development and recent research shows that per capita energy consumption and GDP growth have a reciprocal relationship.¹⁰ Therefore, it is very important for Bangladesh to improve the power and energy sector to ensure the consistency of the economic growth strategy toward joining the developed nations. Power System Master Plan for Bangladesh has been developed to achieve the status of developed country and efficient development and utilisation of domestic natural resources (gas and coal) is considered as Plan 2.¹¹ In the National Energy Policy 2004, natural gas has been given the first priority for fuel energy sustainability. In fact, natural gas contributes to a major part of the country's present energy sources, and energy options are limited for Bangladesh.¹² Natural gas is considered the only major source of energy in Bangladesh which is projected to grow by around 6 percent over the next two decades.¹³

Numerous environmental problems arise throughout the petroleum¹⁴ operation cycle including upstream and downstream phases.¹⁵ However, major environmental problems occur

⁶Metric ton of oil equivalent

⁷“Statistical Review of World Energy 2012,” British Petroleum (2012), http://www.bp.com/assets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/statistical_review_of_world_energy_full_report_2012.pdf, accessed on March 13, 2017.

⁸Kilowatt-hour

⁹Ferdous Ahmed, et al., “Alternative Energy Resources in Bangladesh and Future Prospect,” *Renewable and Sustainable Energy Reviews* 25(2013):698–707.

¹⁰Mazbahu lAhmad and Fahian Tanin, “Next Power Generation-Mix for Bangladesh: Outlook and Policy Priorities,” *Energy Policy* 60(2013):272–83.

¹¹Five plans have been declared; Plan 1: Energy Enhancement of imported energy infrastructure and its flexible operation; Plan 2: Efficient development and utilisation of domestic natural resources (gas and coal); Plan 3: Construction of a robust, high-quality power network improvement; Plan 4: Maximisation of green energy and promotion of its introduction, Plan 5: Improvement of human resources and mechanisms related to the stable supply of energy. For detail see *Power System Master Plan 2016*, Power Division, Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh, 5.

¹²“Bangladesh Energy Study-Executive Summary,” Asian Development Bank, Manila, 1975. <https://www.adb.org/countries/bangladesh/main>, accessed on July 19, 2017.

¹³Bangladesh Institute of Development Studies and Global Subsidies Initiative of the International Institute for Sustainable Development, *A citizen's guide to energy subsidies in Bangladesh*, Dhaka and Geneva, (2012). http://www.bids.org.bd/files/ffs_bangladesh_czguide.pdf, accessed on June 18, 2017.

¹⁴Petroleum means both oil and gas. Bangladesh mainly produces natural gas as petroleum resources. It is governed by the petroleum laws and there is no exclusive law to govern the upstream operation of natural gas. In this thesis the petroleum is interchangeably used with natural gas.

¹⁵The petroleum activities are broadly divided into three segments, namely, upstream (exploration and production), mid-stream (storage, refining and transportation) and downstream (supply and distribution). The upstream segment primarily involves the processes of exploration, development and production of crude oil and natural gas. This research is focused only on the upstream segment. See also, “Terms Used in the Oil Industry:

during the period of exploration and production of oil and gas i.e. during upstream operation. The upstream phase involves drillings and other operations which are usually associated with noise, vibration, various disturbances in the local environment including vegetation and wildlife, soil erosion and changes in surface hydrology. Some extra activities, in the case of onshore operation, like the construction of roads and vegetation clearance over significant territories, are essential. Discharges of drilling fluids containing varying degrees of salinity and cuttings from exploration drillings may cause serious environmental hazards. Some of the very common environmental phenomena during the upstream activities of natural gas are the disposal of waste, atmospheric emission and discharge of effluents containing oil, chemicals and other terms of substances.¹⁶

Most of the international oil companies who are engaged in the exploration and production activities in the various developing countries have always adopted regulations that are promoted towards compliance with the rules and regulations set up by host governments but they avoid adequate adoption and incorporation of environmental issues into their activities.¹⁷ Therefore, there is a growing need to ensure effective environmental standards than a moral or ethical obligation.

The regulation of a country regarding the exploration and production of natural gas should address the technical, fiscal, health, safety and environment issues. The upstream regulation should cover the whole process from licensing to abandonment.¹⁸ Three main levels of regulation such as international, national and corporate self-regulation in the form of industry-wide and individual company guidelines were identified within the complex web of environmental norms and standards.¹⁹ The balance of the three regulations is one of the challenges for Bangladesh for the sustainable exploration of natural gas.

In particular, this research is focused on analysing how the petroleum policy of Bangladesh, the legislative framework, the regulation of petroleum field development have

Institutional Data Base,” <http://www.ri.pemex.com/files/content/Glossary%20201101071.pdf>, accessed on August 10, 2017.

¹⁶ Sergei Vinogradov, “Environmental Protection in the Petroleum Industry,” *Encyclopaedia of Hydrocarbons*, ed. Carlo Amadei (Roma: Eni, 2005): 507-23.
http://www.treccani.it/export/sites/default/Portale/sito/altre_aree/Tecnologia_e_Scienze_applicate/enciclopedia/inglese/inglese_vol_4/507-524_x10.3x_ing.pdf, accessed on September 2, 2017.

¹⁷ Jacqueline Barboza Mariano and Emilio Lèbre La Rovere, “Environmental Impacts of the Oil Industry,” *Encyclopedia of Life Support Systems*, <http://www.eolss.net/sample-chapters/c08/e6-185-18.pdf>, accessed on May 14, 2017.

¹⁸ Keith Myers and Abdul Karim Mohammed, “A Short Guide to Parliamentary Oversight of the Oil & Gas Sector for Parliament of Ghana,” Natural Resource Governance Institute, New York
”<http://oilandgasirc.org.gh/2017/04/a-short-guide-to-parliamentary-oversight-of-the-oil-and-gas-sector-for-the-parliament-of-ghana/>, accessed on August 2, 2017.

¹⁹ Vinogradov, “Environmental Protection in the Petroleum Industry,” 507.

addressed the numerous challenges in exploiting natural gas to achieve optimal extraction and sustainable development of the gas resources of Bangladesh.

1.2 STATEMENT OF PROBLEM

Natural gas is the principal fuel in Bangladesh due to its affordable price and widespread use. Its contribution to the economy of Bangladesh is of manifolds. 75% of commercial primary energy is dependent on it.²⁰ Although the energy mix of Bangladesh is diversifying slowly, ensuring uninterrupted supply of natural gas to support the economic growth of the country is very important.²¹ It is also noticeable that the demand is increasing very fast. Previous policies considering ample supply of this resource may not be sustainable in future. There is high uncertainty in the proven reserve of natural gas in Bangladesh, which also adds another challenge.²²

Exploration and production of petroleum involve great financial and technical challenges. As a result, large International Oil Companies (IOCs) have been formed to conduct international petroleum activity. Participation of these companies or the local investor is generally common in petroleum activity. Therefore, accommodating the interests of the State against the objectives of the international oil companies is a central challenge for any country.²³

Extraction of any petroleum resource creates the demand for effective and sustainable extraction along with protection of the environment surrounding the operation site and security for personnel. The concerned country needs to establish an appropriate regulatory framework with legal and administrative institutions that will balance the demands of petroleum extraction with the sustainable development of the petroleum resources to ensure the benefit of the extraction of petroleum for future generations.²⁴

²⁰Petrobangla, "Annual Report 2015," Bangladesh Oil, Gas and Mineral Corporation (BOGMC), 7. https://petrobangla.org.bd/admin/attachment/webtable/79_upload_0.pdf, accessed on June 19, 2017.

²¹Ibid

²²In 2001, a joint research project with the United States Geological Survey estimated the country's total potential natural gas at 30 TCF. However, the recoverable amount was unclear. See also Herath Gunatilake and David Roland-Holst, "Energy Policy Options for Sustainable Development in Bangladesh," *ADB Economics Working Paper Series* (2013) <https://www.adb.org/sites/default/files/publication/31141/ewp-359.pdf>, accessed on July 15, 2017.

²³Tina Hunter, "Law and Policy Frameworks for Local Content in the Development of Petroleum Resources: Norwegian and Australian Perspectives on Cross-Sectoral Linkages and Economic Diversification", *Mineral Economics*, 27, no. 2 (2014): 115-126.

²⁴Tina Hunter, "Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources A Critical Functional Analysis" (PhD diss., University of Bergen, 2010), 24. http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1353&context=law_pubs accessed on April 18, 2017.

Natural gas is a non-renewable resource and like such any other asset, it is permanently lost when it is extracted and sold or transferred into financial capital. This obviously creates a risk that the capital might be consumed without leaving any lasting impacts in the country. It is necessary for the State to develop a regulatory framework to regulate petroleum exploitation in a way that makes it possible to avoid the risk of depleting the resource and continue the economic and social development. So the regulation should be effective to ensure sustainability in the gas exploration and production in Bangladesh.

The Constitution of the People's Republic of Bangladesh also states in its fundamental principle of state policy that the state shall regard the improvement of public health as among its primary duties²⁵ which is directly related to the environment because sound health without a sound environment is not possible. Therefore, by the very recent amendment of the Constitution in 2011, a new article has been inserted which imposes the responsibility of the state to ensure and develop the environment for present and future citizens and also to make provisions for the conservation and safety of natural resources, biodiversity of forest and wildlife.²⁶ So the state is under a constitutional obligation to conduct the development activities consistent with the safe environment for its citizen. As there is a reciprocal relationship between the development and environment, the balance of them is a great challenge for any state

There exist some laws regarding the protection of the environment which were enacted in British regime and just after the creation of Bangladesh for general environment protection, however they are not focused on controlling the pollution from petroleum operation. Bangladesh has taken initiatives regarding environmental protection after the Stockholm Conference in 1972. As a consequence, Department of Environment was established in 1989. A number of environmental laws such as Environment Policy 1992, Bangladesh Environment Conservation Act 1995, Environment Conservation Rules 1997, Noise Pollution (Control) Rule 2006, National Biodiversity Strategy and Action Plan 2004, Environment Court Act 2010, Bangladesh Water Act 2013, Bangladesh Biodiversity Act 2017 and the National Environment Policy 2018 were also passed following the Stockholm declaration. The study critically analyses how far the provision of these laws are upheld in the sustainable upstream natural gas operation in Bangladesh.

²⁵ The Constitution of the People's Republic of Bangladesh, art. 18(1).

²⁶ Ibid., art. 18A.

All natural gas operation in Bangladesh takes place according to the Bangladesh Petroleum Act 1974. Following the Act, under the Bangladesh Oil, Gas, and Mineral Corporation Ordinance 1985, Petrobangla was established with the responsibility of exploration, production, distribution and marketing of the natural gas in Bangladesh. In fact, there exist a number of laws relating to the exploration, development, extraction, and transmission of natural gas. These are the Mine Act 1923, the Petroleum Act 1934(repealed in 2016), the National Energy Policy 1995, the National Energy Policy 2004, the Bangladesh Energy Regulatory Commission Act 2003, the Bangladesh Gas Act 2010, and Speedy Supply of Power and Energy Act 2010. This study explores how far these laws ensure the sustainable natural gas exploration in Bangladesh and conduct a comparative study with that of other countries from the developed and developing world.

Some of the petroleum-producing countries like Republic of Congo, Equatorial Guinea and Cameroun do not have any laws to control the petroleum operation and to some extent, the laws exist in an inconsistent and uncoordinated manner. There are some countries like Saudi Arabia and Angola whose governments are shy to implement the national and international environmental law for the fear of the negative impact on the economy.²⁷ In the case of the United Kingdom, the mandatory requirement for a license of petroleum operation of every applicant includes a statement of environmental policy including the measures to minimise the risk posed to the environment in their application and this is the prior condition to grant the license to any IOC or state-owned company.²⁸ Canada, which may be sighted as an example of one of the best countries to conduct the oil and gas exploration and exploitation in the world, is very environment friendly and approach the petroleum activities from the standpoint of sustainable development. The country has a detailed and substantial regulatory framework for the control of oil and gas pollution from petroleum operation. On the other hand Nigeria may be considered as the country where the extraction of petroleum added a negative impact on their economy and the environment due to the lack of proper regulatory framework. Maximising oil output with little or no attention to the negative or hazardous impact on the environment is considered one of the major causes of this.²⁹ Therefore, lessons and experiences of different petroleum-producing countries help to find

²⁷Mario Mansour and Carole Nakhle. *Fiscal Stabilization in Oil and Gas Contracts: Evidence and Implications*. (Oxford Institute for Energy Studies, 2016), 15. <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/02/Fiscal-Stabilization-in-Oil-and-Gas-Contracts-SP-37.pdf>, accessed on July 22, 2017.

²⁸Aniefiok E. Ite et al., "Petroleum Exploration and Production: Past and Present Environmental Issues in the Nigeria's Niger Delta," *American Journal of Environmental Protection*, 1, no. 4 (2013): 78-90.

²⁹Amaka .G. Eze and Ted .C. Eze, "A Survey of the Legal Framework for the Control of Oil and Gas Pollution from Some Selected Countries," *Journal of Law, Policy and Globalization* 31(2014): 1-9.

out a more appropriate regulatory framework for sustainable natural gas extraction in Bangladesh.

Accident associated with petroleum operation during the exploration is very common throughout the world. A coherent relationship between major oil and gas mishaps and lack of sustainable practices is evident from some disasters in the previous decades. The Piper Alpha– Oil Rig Fire in 1988 in the North Sea is such an incident that took away 167 lives.³⁰ Similarly, explosion in the Amuay Oil Refinery in Venezuela killed 39 people in 2012.³¹ The largest marine oil spill occurred in the Gulf of Mexico in 2010. This incident is also known as the Deepwater Horizon oil spill and was caused by an undersea explosion which killed thousands of birds, mammals and sea turtles.³² In the light of such disasters in the oil and gas industry, it becomes imperative for the oil and gas exploring companies to follow the sustainability guidelines.

Bangladesh has faced several blowouts that are liable for alarming environmental degradation in the natural gas sector.³³ The first blowout occurred during the East Pakistan era in 1955 in Sylhet-1.³⁴ The second blowout was in Sylhet-4 in 1962.³⁵ Blowout in the Magurchara gas field in Moulvibazar’s Kamalganj Upazila occurred on June 14, 1997 and caused severe damage to the Lawachhara Reserve Forest.³⁶ Occidental, the US energy company drilling there provided no compensation. Another blowout on January 7, 2005 in Tengratila, Chatak gas field burnt for a couple of months, while the concerned operating

³⁰ Terry Macalister “Piper Alpha Disaster: How 167 Oil Rig Workers Died,” *The Guardian* July 4, 2013, <https://www.theguardian.com/business/2013/jul/04/piper-alpha-disaster-167-oil-rig>, accessed on July 26, 2017.

³¹ Sailu Urribarri and Marianna Parraga, “Explosion Kills 39 at Venezuela's Biggest Refinery”, *The Reuters*, 2012, <http://www.reuters.com/article/us-venezuela-refinery/explosion-kills-39-at-venezuelas-biggest-refinery-idUSBRE87O02R20120826>, accessed on July 25, 2017.

³² Mohamad Danish Anis and Tauseef Zia Siddiqui, “Issues Impacting Sustainability in the Oil and Gas Industry,” *Journal of Management and Sustainability* 5, no. 4 (2015): 115-23.

³³ Md. Ashraful Islam Khan and Fuad Bin Nasir, “A Review over Major Gas Blowouts in Bangladesh, their Effects and the Measures to Prevent them in Future,” *International Journal of Scientific & Technology Research* 3, no. 9 (2014):109-113.

³⁴ Badrul Imam, *Energy Resources of Bangladesh: Natural Gas, Oil, Coal* (Dhaka: University Grant Commission of Bangladesh, 2005): 84-95.

³⁵ *Ibid.*, 142-146.

³⁶ According to some unofficial estimate by the National Committee to Protect Oil-Gas-Mineral Resources and Port, the blowout caused a loss of more than Tk 9000 crore and gas reserve of about 245 billion cubic feet was burnt in the explosion while the environment, ecology, and wildlife of the area were also severely affected. See also “Bangladesh: Gas explosion: Compensation from Niko, Unocal Demanded,” *The New Nation*, June 13, 2006. <http://www.corpwatch.org/article.php?id=13727>, accessed on September 20, 2017 and “No Compensation of Blowout in 19 Years,” *The New Nation*, October 07, 2017. <http://thedailynewnation.com/news/97027/no-compensation-of-blowout-in-19-years.html>, accessed on October 7, 2017.

company Niko did not take any effective measures.³⁷ The blowout caused severe damage to the environment of the adjoining area as well as property loss.³⁸

Bangladesh has ratified a number of international treaties regarding the protection of the environment and therefore, the Government is morally obligated to incorporate those provisions in the domestic legislation. So the petroleum contract which is popularly known as the Production Sharing Contract (PSC) should reflect those provisions regarding the environment in the terms and conditions of the PSC. This research analyses the model PSCs of Bangladesh regarding the environmental concern during the natural gas exploration and examines some actual contracts for natural gas exploitation in a more environmentally friendly way.

1.3 NATURAL GAS RESOURCE OF BANGLADESH

In Bangladesh, the exploration of petroleum resources started in the later part of the 19th century during the British period in the then undivided Indian subcontinent, though it was not in an organised form.³⁹ The first discovery of oil in this region was in 1890 in Digboi of Assam, India.⁴⁰ The first drilling in Bangladesh region took place in 1908 by Indian Prospecting Company near Sitakund, Chittagong and the first exploratory shallow well was drilled by the Burma Oil Company (BOC) in 1914 but no success was achieved.⁴¹ Two exploratory drillings were conducted by BOC between the period 1923 to 1933 in Patharia and the sign of oil was found in one well but there was no any commercial production.⁴² Thereafter National Oil and Gas Development Corporation of Pakistan and some International Oil Companies (IOCs) conducted their exploration activities during the period 1950 to 1971 and drilled 22 wells offshore and onshore. This period is called the golden time for the petroleum industry in Bangladesh as 8 gas fields were discovered, of which 5 were

³⁷Mahmuda Nasreen, Khondokar Mokaddem Hossain and Debashish Kumar Kundu, "The Interrelationship between Poverty, Environment and Sustainable Development in Bangladesh: An Overview," *Bangladesh e-Journal of Sociology*, 3, no.2 (2006), <https://www.researchgate.net/publication/238622968>, accessed on September 21, 2017.

³⁸The Department of Environment submitted a report determining the loss of environment and found that the soil of the surrounding fields up to 2 km were severely affected and lost fertility. The land area up to 8 km from the blowout point was moderately affected. See also "Villagers Flee Fire at Bangladesh Gas Field," *The Age*, June 26, 2005, <http://www.theage.com.au/news/world/villagers-flee-fire-at-bangladesh-gas-field/2005/06/26/1119321947220.html>, accessed on May 22, 2017.

³⁹Bernhard G. Gunter, "Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions," *Bangladesh Development Research Working Paper Series (BDRWPS)* no.3 (December 2008): 2.

⁴⁰Ibid,2.

⁴¹Md. Rashidul Haque, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," (Masters of Engineering Thesis, Bangladesh University of Engineering & Technology, 2000): 16.

⁴²Jakir Hossain, "Bangladesh Gas Sector Development: Status, Policy Options and Challenges," *Centre for Policy Dialogue* no. 24, (May 2000): 150.

discovered by the IOCs and 2 by the then Pakistan Petroleum Ltd. and 1 by National Oil and Gas Development Corporation of Pakistan.⁴³ The first gas field was discovered in 1955 at Haripur and the second was in 1959 at Chattak in Sylhet district.⁴⁴ Two other major gas fields, Titas and Habiganj, were discovered in 1962 and 1963 respectively.⁴⁵ The natural gas exploitation was first begun in 1960 at Chattak by Pakistan Petroleum Ltd.⁴⁶ After the independence of Bangladesh, exploration of petroleum was started with a new parameter both by the national and international oil companies. In 9 August 1975, the Government led by Bangabandhu Sheikh Mujibur Rahman purchased 5 gas fields from IOCs and established, for the first time, the sole national ownership of the national oil companies.⁴⁷ It was a remarkable decision of the Government to secure the energy sector of Bangladesh. Thereafter, a number of wells were drilled and seven more gas fields were discovered including one offshore gas field. The first 3D seismic survey was introduced in Bangladesh in the Bibiyana gas field, which started production in March 2007.⁴⁸ The country has discovered 27 gas fields and the 27th was discovered in Bhola by BAPEX⁴⁹, the national oil company.⁵⁰ The country is ranked seventh among the natural gas producing countries in Asia.⁵¹ According to the report of Petrobangla, 21 gas fields are under production, production suspended in 4 fields and 2 fields, Kutubdia and Bhola, are yet to produce.⁵² Despite increased rate of production to meet the rising demand of different sectors, the gap between supply and demand is widening day by day. During December 2016, daily production of gas was 2700 MMSCFD.⁵³ Bangladesh produces 2.7 billion CFT⁵⁴ while the demand is 3.4 billion CFT. The major consumers are the power plants (58%), factories (17%), household

⁴³Haque, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," 16

⁴⁴Hossain, "Bangladesh Gas Sector Development: Status, Policy Options and Challenges," 150.

⁴⁵Haque, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," 17.

⁴⁶K.A.S. Murshid and Arne Wiig, "A Review of Development Trends in The Energy Sector of Bangladesh," Chr. Michelsen Institute *Development Studies and Human Rights*3(2001): 12.

⁴⁷Petrobangla, "Annual Report 2015," 17.

⁴⁸Petrobangla, "Annual Report 2015," 17.

⁴⁹Bangladesh Petroleum Exploration & Production Company Limited

⁵⁰Aminur Rahman Rasel, "BAPEX Discovers New Gas Field in Bhola," *The Dhaka Tribune*, December 13, 2018.

⁵¹"U.S. Energy Information Administration," *Independent Statistics and Analysis*, <https://www.eia.gov/> accessed on May 14, 2017.

⁵²Petrobangla, "Annual Report 2017," Bangladesh Oil, Gas and Mineral Corporation (BOGMC), 18. https://petrobangla.org.bd/admin/attachment/webtable/79_upload_0.pdf, accessed on July 21, 2019.

⁵³Million standard cubic feet per day

⁵⁴Cubic feet

(11%), fertilizer industry (7%), and automobiles (6%).⁵⁵ According to the official website of Petrobangla, the proven reserve of gas was 20.77 TCF⁵⁶ and the remaining proven and probable reserve as on January 2016 is 13.60 TCF.⁵⁷ In a parliamentary debate in 2020 State Minister for Power, Energy and Mineral Resources of Bangladesh described that the present stock of gas reserve is 10.63 TCF while the daily production is 2579 MMCF and the reserved gas will be exhausted within next eleven years if the present production rate is continued.⁵⁸ Although the gas reserve and generous concessions offered by the Government, interest shown by IOCs for the exploration of natural gas in Bangladesh has been low for quite some time.⁵⁹

1.4 REGULATORY ORGANISATION OF PETROLEUM RESOURCES IN BANGLADESH

The Petroleum Law 1899, the law to deal with the issues relating to petroleum operation, was enacted before the starting of exploration activities in this subcontinent in 1908.⁶⁰ In 1934, the Petroleum Act was passed and following the Act, the Petroleum Rules 1937 was formulated. Both the Act and the Rules did not specify any special organisation to handle the issues relating to petroleum. The Petroleum Act empowered the Government to make rule to regulate, import, transport and storage of petroleum,⁶¹ though there was no specific organisation to conduct these activities. Some organisational improvement can be seen after the formulation of the Pakistan Petroleum (Production) Rules 1949. Definition of the Director of Petroleum was given⁶² in clause 2 of the rules to conduct some of the activities for granting license under this Act. The Rules provided detail about the terms and conditions for granting license of exploration of petroleum, lease and mining concession. It did not provide

⁵⁵ Senior Correspondent, “Bangladesh Discovers New Gas Field in Southern District of Bhola,” *BDNews24.com*. October 23, 2017

⁵⁶ Trillion cubic feet

⁵⁷ Petrobangla, <http://petrobangla.org.bd/?params=en/gasblockandreserve/reserve/> accessed on November 30, 2016.

⁵⁸ “Country’s Gas Reserve will be Exhausted in 11 Years: Nasrul Hamid,” *The Daily Star*, January 20, 2020. <https://www.thedailystar.net/country/news/countrys-gas-reserve-may-be-exhausted-11-years-nasrul-hamid-1856629> accessed on September 10, 2020.

⁵⁹ D.R. Hallermann analyzed the hydrocarbon exploration desirability of seven developing countries- Albania, Bangladesh, Gabon, Indonesia, Malaysia, Myanmar, and Vietnam- that have showed considerable interest for hydrocarbon exploration. See for detail Detlef R. Hallermann, “A Comparative Analysis of Production-Sharing Contracts and Economic Risk Using a Weighted Criteria Decision Analysis Model,” In *Proceedings of 69th Annual Society of Petroleum Engineers Technical Conference*, New Orleans, Louisiana. (September 1994), S.P.E. paper #28345.

⁶⁰ Haque, “Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh,” 16.

⁶¹ The Petroleum Act 1934, Act No. XXX of 1934 of the People’s Republic of Bangladesh, s.4 (1934).

⁶² Pakistan Petroleum (Production) Rules 1949, Ministry of Laws and Parliamentary Affairs, cl. 2 (1949).

any separate organisation to handle the matter relating petroleum activities, and the Government used to directly handle all the matters concerning petroleum. Clause 4 of the Rules clearly stated that the application for license was to be made to appropriate ministry of the Government of Pakistan .⁶³ Clause 8 of this Rules mentioned that the application of license or lease for the assignment was to be made to the appropriate ministry.⁶⁴ Pre exploration license was granted by the then Central Government,⁶⁵ but Director of Petroleum was used to approve the work program. The oil mining lease was granted by the Government and before granting the mining lease, the Government used to conduct a topographical survey at its own cost.⁶⁶ It appeared that at that period, the regulatory body of the petroleum sector was the Government itself with some assistance from the Director of Petroleum and the President directly contracted with the national or international oil companies regarding the matter of exploration and production of petroleum.⁶⁷

The first formal organisation, the Oil and Gas Development Corporation (OGDC), related to petroleum operation was established in 1961 under the Oil and Gas Development Corporation Ordinance 1961. OGDC was empowered with the function to plan, promote, organise and implement programmes for the exploration and development of oil and gas resources as well as for production, refinement and sale of oil and gas. OGDC's responsibilities included conducting various surveys for exploration, estimating petroleum reserves and carrying out the research for development of the petroleum.⁶⁸ By this very Act, the foundation of petroleum activities with a view to strengthening research activities was established in Bangladesh.⁶⁹

After the liberation of Bangladesh, the part of the OGDC was reconstituted as Bangladesh Mineral Oil and Gas Corporation (BMOGC) by the Presidential Order 27 of March 26, 1972.⁷⁰ In the same year, the operational activities of the corporation were separated and vested to a new organisation named as Bangladesh Mineral Development Corporation (BMDC) by the presidential order number 120.⁷¹ Bangladesh Oil and Gas

⁶³Pakistan Petroleum (Production) Rules 1949,cl. 4.

⁶⁴Ibid., cl. 8.

⁶⁵Ibid., cl. 14.

⁶⁶Ibid., cl.29 and 33.

⁶⁷Ibid, cl. 41.

⁶⁸Oil and Gas Development Corporation Ordinance1961 s 12.

⁶⁹“A Study on Accounting Systems of Petrobangla” <https://lawaspect.com/study-accounting-systems-petrobangla/> accessed on May 10, 2019.

⁷⁰BD Yellow Pages, “Bangladesh Oil and Gas Mineral Corporation,” Online Business Directory <http://bdyellowpages.net/description/BangladeshOilandGasMineralCorporation> accessed on May 10, 2019.

⁷¹“Bangladesh Oil, Gas and Mineral Corporation,” Ministry of Power, Energy and Mineral Resources,https://www.mpemr.gov.bd/public_service/details/4 accessed on May 10, 2019.

Corporation (BOGC) was established under the Ordinance number 15 of 1974 with a view to enhancing the petroleum activities.⁷² In 1976, the downstream functions of the petroleum activities including importation were vested to a newly constituted institution Bangladesh Petroleum Corporation (BPC).⁷³ Finally, in 1985 the BMDC and BOGC were merged into a single entity, Bangladesh Oil, Gas and Mineral Corporation (BOGMC), under the Bangladesh Oil, Gas and Mineral Corporation Ordinance 1985.⁷⁴ The natural gas is under the Energy and Mineral Resources Division of Ministry of Power, Energy and Mineral Resources (MoPEMR) which was vested on BOGMC, popularly known as Petrobangla.⁷⁵ Petrobangla is the principal organisation to deal with the upstream activities of the of the petroleum or natural gas resources of Bangladesh.

1.5 SUSTAINABLE DEVELOPMENT CONCEPT IN THE OIL AND GAS SECTOR

The sustainable development⁷⁶ concept was introduced in the later part of the twentieth century. This very concept is being widely used in many areas of activity throughout the world. It is assumed that the excessive and uncontrolled use of natural resources to foster the economic growth in many countries of the world was the driving force behind the emergence of the sustainable development concept. Annual reports, trade literature and proceedings of the oil and gas industry reveal that this concept has become a part of their vocabulary.⁷⁷

The oil and gas industry has adopted the definition of sustainable development provided by Brundtland Commission and has developed the following “triple bottom line” framework as follows:⁷⁸

1. Corporate economic growth, as measured in terms of revenues, earnings, and shareholder return, is the analogue of a nation’s economic growth, based on the taxes,

⁷²“A Study on Accounting Systems of Petrobangla” <https://lawaspect.com/study-accounting-systems-petrobangla/> accessed on May 10, 2019.

⁷³Ibid.

⁷⁴“A Study on Accounting Systems of Petrobangla”

⁷⁵“Bangladesh Oil, Gas and Mineral Corporation,” Ministry of Power, Energy and Mineral Resources, https://www.mpemr.gov.bd/public_service/details/4 accessed on May 10, 2019.

⁷⁶Sustainable development has been defined in many ways, but the most frequently quoted definition is from *Our Common Future*, also known as the Brundtland Report: “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.” <http://www.un-documents.net/our-common-future.pdf> accessed on January 24, 2017.

⁷⁷Jacqueline Lang Weaver, Sustainable Development in the Petroleum Sector in *Energy Law and Sustainable Development*, eds. Adrian J. Bradbrook and Richard L. Ottinger(International Union for the Conservation of Nature, 2003),45.<http://www.ugandaoilandgas.com/linked/sustainable%20development%20in%20the%20petroleum%20sector.pdf>, accessed on July 8, 2017.

⁷⁸Adapted from Conoco Sustainable Growth Report, 7 (June 2002). See also Martin Whittaker, “Emerging ‘Triple Bottom Line’ Model for Industry Weights Environmental, Economic and Social Considerations,” *Oil & Gas Journal*23 (1999): 97.

royalties, profit-sharing revenues, employment effects and technology transfers that private investment in the oil and gas sector brings to a nation.

2. Corporate environmental stewardship, as measured in terms of increased energy efficiency, pollution reductions, and mitigation projects, becomes the analogue of a nation's environmental goals for cleaner air, water and land, and for the preservation of areas of unique ecological value.

3. Corporate social progress, is measured in terms of community outreach, human rights, labour standards, respecting diversity in the workplace and preventing conflicts. Earnings from domestic oil and gas production can be spent on social infrastructure projects that reduce income inequality and provide affordable, clean energy to underserved populations.

1.6 LITERATURE REVIEW

Literature review is an integral part of a thesis and is described as, “the foundation and inspiration for substantial, useful research.”⁷⁹ Literature review in this thesis is done for three purposes as suggested in Thomas and Hodges.⁸⁰ Firstly, evaluation of existing researches helps the researcher to identify relevant terminology and information. Secondly, the researcher can identify the suitable research techniques after critically examining the existing scholarly articles.⁸¹ And lastly, a literature review can help to provide original contribution to the selected area by identifying how it differs from that of other researchers.⁸²

Natural gas is the most valuable resource for Bangladesh which is used as fuel for generating power, to produce fertiliser for agriculture, and in other domestic purposes. In fact, this is the prime source of energy in Bangladesh. Therefore there is a need for paying some special attention and conduct research considering the different aspects of this indigenous resource. However, the area of this research is largely an emerging field. Consequently not much intellectual activity in the form of textbooks and journal publication

⁷⁹ David Boote and Penny Beile, “Scholars before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation,” *Educational Researcher* 34, no. 6 (Aug-Sep. 2005):3-15. <https://www.jstor.org/stable/3699805> accessed on August 18, 2017.

⁸⁰ David R. Thomas and Ian D. Hodges, *Doing a Literature Review in Designing and Managing your Research Project* (SAGE, 2010),105.

⁸¹Boote and Beile “Scholars before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation,” 3-15.

⁸²Lachmi Singh, “*The United Nation Convention on Contracts for the International Sales of Goods 1980 (CISG) An Examination of the Buyers Remedy of Avoidance under the CISG: How is the Remedy Interpreted, Exercised and what are the Consequences of Avoidance?*”(PhD diss., University of the West of England, 2015), 28.

has taken place on the subject matter of the research. Few publications that exist in the area of the research are as follows:

Faruque⁸³ studied the stability risk management system of petroleum contract of some selected developing countries. In his book he examines the stability mechanism through surveying the model and actual production sharing contract. This book also explains the stabilisation clauses as a tool of the political risk management and analysing their legal efficacy. Financial stability and renegotiation are also discussed in this book and reflects that renegotiation is beneficial for both the parties. In case of petroleum contract, the settlement of dispute and its mechanism are also discussed here. Finally, the book concludes that both financial and non-financial factors are responsible to affect the stability of the petroleum contract and among the non-financial factors the environmental legislation of the host country affects the contract. However, this book does not address the sustainability in case of exploration and exploitation of petroleum of those countries including Bangladesh.

In a study regarding the stability clauses in Petroleum contracts, Faruque⁸⁴ has studied petroleum laws of several countries, mainly of developing economies. In this study, the main focus is on the causes which affect the stability clauses and the associated risk due to the long-term nature of the petroleum contracts. The study also reflects the environmental aspect relating to petroleum contracts and has found that Bangladesh's model production sharing contract merely addresses environmental protection as a general obligation of the contractor without elaborating any specific standard regarding environmental performance.⁸⁵ He also has suggested that in the initial stage of a project integration of environmental planning and undertaking preventive measures throughout life cycle of the project can better reduce the regulatory and liability risk than a traditional contractual guarantee of stability clause. The study has tried to find out a relation of environmental legislation with the long-term petroleum contract. However the upstream operation of petroleum especially natural gas in Bangladesh perspective is not covered by the study.

⁸³ Abdullah Al Faruque, *Petroleum Contracts: Stability and Risk Management in Developing Countries*, (Dhaka: Bangladesh Institute of Law and International Affairs, 2011).

⁸⁴ Abdullah Al Faruque, “*Stability in Petroleum Contracts: Rhetoric and Reality (Lessons from the Experiences of Selected Developing Countries and Economies in Transition (1980-2002)*” (PhD diss., University of Dundee, Scotland, 2005). [http://discovery.dundee.ac.uk/portal/en/theses/stability-in-petroleum-contracts\(a180d06b-30c1-46e0-b054-346887e8f369\).html](http://discovery.dundee.ac.uk/portal/en/theses/stability-in-petroleum-contracts(a180d06b-30c1-46e0-b054-346887e8f369).html), accessed on June 16, 2017.

⁸⁵ See, Model Production Sharing Contract 1997, Bangladesh Oil, Gas and Mineral Corporation, MoPEMR, Bangladesh, art10.6.

Haque⁸⁶ has studied in his Master's thesis the effects of petroleum legislation on hydrocarbon exploration and development in Bangladesh. In this research, the laws and policies related to the exploration and development of natural gas in Bangladesh have been reviewed and discussed. This study focuses on the background of natural gas exploration and measures taken to enhance exploration. It also has highlighted the PSC activities in Bangladesh, compared different fiscal systems, and forwarded suggestions based on the then policies and contractual framework. The key findings of this study are:⁸⁷

(i) After every new legislation and policy changes, exploration activities were increased.

(ii) Bangladesh is one of the least explored regions in the world. The legislative and commercial terms require flexibility to attract investment in high-risk/ high-cost areas like western part of the country and off-shore areas.

(iii) To attract IOCs the potential rewards for hydrocarbon exploration must at least equal the competitive incentives offered by other countries with similar prospects.

(iv) To maintain the transparency of the whole production sharing negotiation and to prevent lobbying, employment of a local agent before signing an agreement should be avoided. A group of expert professionals from different related professions should be included in the negotiation team.

(v) Provisions should also be made in the PSC to get compensation from any accident like Magurchhara from non-recoverable cost.

(vi) Petrobangla or Government of Bangladesh should have permanent committee to review all aspects of the PSC on a regular interval to meet the global changing circumstances.

The study is helpful to have an overall view of the chronology of the petroleum legislation in Bangladesh as well as progress in the extraction.

Moniruzzaman⁸⁸, in his Master's thesis, studied the model PSCs developed in 1997 and 2008 and compared them with those of some regional countries like India, Malaysia, Pakistan, Vietnam, Turkmenistan and Trinidad & Tobago. In this research most of the important aspects such as contract terms, exploration period, mandatory work program, biddable work program, royalty, cost recovery, profit sharing, import duty on instrument,

⁸⁶Haque, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," 17.

⁸⁷Haque, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," 17.

⁸⁸Md. Moniruzzaman, "Comparison of some Asian Offshore Production Sharing Contracts with Respect to Bangladesh" (Master of Engineering Thesis, Bangladesh University of Engineering & Technology, 2009). <http://lib.buet.ac.bd:8080/xmlui/handle/123456789/1488> accessed on April 23, 2017.

personal income tax, corporate income tax, training of Bangladeshi personnel, guaranties and payment currency etc. are compared with the model PSCs of the above mentioned countries. The study concludes that the overall contract was found to be balanced and very much comparable to the regional countries. Though this study does not reflect on the key issues of the sustainability of natural gas extraction, this work is helpful to find the similarities and dissimilarities of some features of the Model Production Sharing Contract (MPSC) of Bangladesh and other countries with similar economical condition.

Bakht⁸⁹ conducted environmental impact assessment of natural gas development in Bangladesh. The study considers the case study of Magurcharra gas field and focuses on identifying the both positive and negative impacts of upstream and downstream activities of natural gas on the environment. However, the study does not cover the legal issues related to the exploration and development of natural gas.

Hunter⁹⁰ studied the sustainable development of Australian petroleum resources. She found that a lot of challenges had to be faced by the host State to ensure the sustainable development of petroleum. These are political, social, economic, regulatory, commercial and technological challenges. In this study only the socio economic sustainability was focused upon. Therefore, for more efficient development she compared the Australian regulatory framework with that of Norway, which is considered as a model in the world to achieve the desirable success in the petroleum sector. This study consults only about the offshore petroleum development. However, analysing Australia's policy she found that it failed to ensure the maximisation of the value of Australian petroleum for the benefit of the Australian citizen as some of its provision created unnecessary burden and increases the socio economic cost. She also highlighted that the allocation of licence procedure did not encourage the sustainable development of petroleum resources in Australia. Furthermore the study reflects that the extraction procedure of petroleum in Australia is not compatible with the sustainability provisions. Finally, she suggested a single regulatory mechanism with institutional capacity.⁹¹ Reviewing this thesis the researcher could grasp the fundamental concept of the sustainable development linked with the petroleum industry. Also this thesis elucidates how the offshore petroleum operation can be made sustainable in Australia

⁸⁹Delawar Bakht, "*Environmental Impact Assessment of Natural Gas Development in Bangladesh*" (Master of Engineering Thesis, Bangladesh University of Engineering and Technology, Dhaka, 1998). <http://lib.buet.ac.bd:8080/xmlui/handle/123456789/552> accessed on May 4, 2017.

⁹⁰Hunter, "Law and Policy Frameworks for Local Content in the Development of Petroleum Resources," 115-126.

⁹¹Hunter, "Law and Policy Frameworks for Local Content in the Development of Petroleum Resources," 115-126.

The purpose of the review of books and theses is to identify academic commentary in the area of sustainable natural gas extraction in Bangladesh. The research undertaken by other scholars is used as a foundation for framing the research questions for the thesis. Besides the above-mentioned books and theses, some research articles have also been reviewed. These works are not complete and most of them do not reflect the legal issues involved in the sustainable extraction of natural gas in Bangladesh. However, review of these articles was done to develop the conceptual framework for identifying the main theme of the thesis.

Aminuzzaman's⁹² study on the Environmental Policy of Bangladesh finds that the National Environmental Policy does not clarify the measures needed for the protection of environment and the policy fails to address the requirement for guideline concerning issues like, bio-safety, intellectual property right, watershed management and trans-boundary movement of hazards and environmental problems. Aminuzzaman also notices that the Bangladesh Petroleum Act, 1974 requires all the petroleum operations to be carried out in accordance with good oil-field practice without interfering with the ecology and environment but it does not clarify the factors connected with the ecology and environment and the kind of management elements a company should establish and maintain to discharge its obligations under the Act. The study will be helpful for the proposed research work. This report considers Magurcharra gas field failure to highlight the consequences on the environment. Aminuzzaman also mentions that Bangladesh has categorised petroleum projects as a Red Category in the Environment Conservation Rules, 1997 and made EIA mandatory for such projects.

Azad et al.⁹³ in "Energy and Waste Management for Petroleum Refining Effluents: A Case Study in Bangladesh," examines management and treatment of waste water from petroleum industries in Bangladesh and finds that the rational use of energy and adequate environmental management are necessary for environmental sustainability.

Billah and Khan⁹⁴ in a research article examines the effects of gas resource extraction on sustainable consumption for maintaining better standard of living. A model for estimating gas resource depletion of Bangladesh is developed, then used to make necessary adjustment with sectoral GDP that reflected the effects of resource extraction. According to them,

⁹²Salahuddin M. Aminuzzaman, *Environment Policy of Bangladesh: A Case Study of an Ambitious Policy with Implementation Snag* (South Asia Climate Change Forum, Monash University, Australia, 5 - 9 July, 2010).

⁹³A.K. Azad et al., "Energy and Waste Management for Petroleum Refining Effluents: A Case Study in Bangladesh," *International Journal of Automotive and Mechanical Engineering* 11(2015): 2170-2187.

⁹⁴AHM Mustain Billah and Md. Abdul Aziz Khan "Gas Extraction and Its Implication for Economic Sustainability of Bangladesh," *The Bangladesh Development Studies* 27, no.3 (2001):1-34.

environmental capital (pollution) may also be incorporated into economic depletion associated with extracting natural gas. This is pertinent to the development activities for the production of natural gas. Policy makers may take into account the issues of depleting the natural resources, use of resource rent and the impacts of development activities for extracting the resources.

Clemett⁹⁵ reviews the Environmental Policies and legislation of Bangladesh and found that these are well constructed and comprehensive to protect water from industrial and other effluent. The Environmental Conservation Act and Environmental Conservation Rules, and National Water Policy have adequate clauses relating to industrial pollution.

Eze and Eze⁹⁶ in “A Survey of the Legal Framework for the Control of Oil and Gas Pollution from Some Selected Countries” analyse the efficacy of the present Nigerian statutory framework to control the oil and gas pollution and compared it with the laws and regulation of some selected countries such as Canada, The United Kingdom, The United States of America, Saudi Arabia, Iraq, Angola, Equatorial Guinea, Congo, Cameroun and Chad. This study examines the legal framework for the control of oil and gas pollution in some developed and developing countries. The study notices that in the developing countries the national oil spill response is not efficient and effective due to lack of capacity for enforcement of existing laws, weak institutions and poor governmental structure. Whereas in developed economies the institutional framework and regulations are quite effective to implement their national oil spill contingency plans. Anti-oil pollution laws in such countries exist actively in place and effectively enforced.

A study of environmental management plan for oil and gas exploration along coastal areas of Bangladesh was conducted by Hoque et al.⁹⁷ The aims of the paper was the identification of negative environmental impacts of oil and gas exploration activities and evaluation of the magnitude of these impacts on environmental ingredients, socio-economic conditions and quality of life. The survey was conducted through interviewing environmental experts, technical persons and other related key persons. The study concludes that the

⁹⁵ Alexandra Clemett, *A Review of Environmental Policy and Legislation in Bangladesh*, (Department for International Development, 2006). <https://www.gov.uk/dfid-research-outputs/a-review-of-environmental-policy-and-legislation-in-bangladesh> accessed on August 18, 2017.

⁹⁶Eze and Eze, “A Survey of the Legal Framework for the Control of Oil and Gas Pollution from Some Selected Countries,” 1-9.

⁹⁷ M.M.M. Hoque et al., “Development of Environmental Management Plan (EMP) for Oil and Gas Exploration along the Coastal Areas of Bangladesh,” *Journal of Innovative Development Strategy* 5 no.1 (2011):50-60.

vulnerability of wildlife and biodiversity may come under threat for the activities as it disconnect ecological balance and natural settings of the area.

Islam and Raihan examined some gas field accidents in Bangladesh and assessed environment related issues in natural gas management. Based on the study results, the strengthening of legal protection was recommended by enacting laws relating to extraction of natural resources, safety and security.⁹⁸

Norwegian Agency for Development Cooperation evaluated the existing system and identified five criteria provide assistance in the petroleum sector. Those are relevance, impact, effectiveness, efficiency and sustainability. The evaluation revealed that environmental issues seem to have been given no priority as well as petroleum economics and environmental issues seem to have been left out in the activity of Bangladesh Petroleum Institute (BPI).⁹⁹

Moula et. al. studied the economic benefit that may be gained by Bangladesh from its maritime zones by exploring natural resources especially natural gas. The study also recommended that the national institution Bangladesh Petroleum Exploration and Production Company Limited (BAPEX) should be reformed with the experienced manpower and empowered with modern technology to explore and extract petroleum resources of the maritime zones of Bangladesh.¹⁰⁰

Quader and Gomes reviewed some research papers concerning the history of natural gas production, reserve, present and future demand and the alternative use of gas for generating revenue. They conclude that the country does not have regulatory framework to administer the operations of IOCs and PSCs whether it is for approving a plan or a budget or operation and the country is also not fully aware of the implications of different contracts/agreements to be signed. Quader and Gomes also emphasise that the whole issue

⁹⁸M. Sirajul Islam and Khaled Mahmud Raihan "Natural Gas Management: A Bangladesh Perspective", https://ndc.gov.bd/lib_mgmt/webroot/earticle/886/Natural_Gas_Management-_A_Bangladesh_Perspective.pdf accessed on January 10, 2017.

⁹⁹Norwegian Agency for Development Cooperation, "*Evaluation of the Norwegian Petroleum-Related Assistance Case Studies Regarding Mozambique, Bangladesh, East Timor and Angola*,"(2007).<https://evalueringsportalen.no/evaluering/evaluation-of-the-norwegian-petroleum-related-assistance-case-studies-regarding-mozambique-bangladesh-east-timor-and-angola>, accessed on July 28, 2017.

¹⁰⁰Golam Moula, Fahamida Parvin and Jannatul Ferdous, "The Prospects and Challenges before Bangladesh in Exploring and Exploiting Marine Resources: An Economic and Legal Study," *Beijing Law Review*, 5(2014): 249-252.

needs to be studied and understood to appreciate the implications and their impact on Bangladesh.¹⁰¹

Sultana¹⁰² conducted a study to examine the existing environmental accounting and reporting practice of Petrobangla and its companies. Sultana focused on four major issues such as reporting about environmental information, maintaining provision for environmental liability and environmental cost, maintenance of environmental accounting, and classification of environmental expenditures as capital expenditure or operating expenditure. The study reports that Petrobangla and its associated companies have disclosed only qualitative and descriptive information without any attempts at quantification. The environmental reports of Petrobangla do not include information regarding waste generation, conservation of energy, water wastage and recycling of waste, noise, nuisance etc. Moreover, Petrobangla and its associated companies do not maintain any provision for contingent environmental liability. This article helps the researcher to frame conceptual knowledge and is also helpful for future study.

Review of relevant literatures reveal that the selected area for this research is very important from the national interest point, has importance in the academic arena as well as there are scopes for original contribution for the sustainable development of natural gas in Bangladesh.

1.7 RATIONALE OF THE STUDY

The literature on the legal and regulatory framework of sustainable extraction of natural gas in Bangladesh is very limited. Therefore, there is a huge scope for more academic writings with original contribution and inquiry. This research, aims to make its own modest original contribution to the discourse in the followings ways:

1. In fact, there is merely any complete existing work that looks at natural gas resources of Bangladesh in the context of sustainable development. There is also limited information or research work that focuses upon the equally compelling imperative of Bangladesh to profit from its resources and at the same time not to worsen the situation than before through assuring and implementing principles of sustainable development as an authoritative tool to inform the formulation of policy and potentially legal arrangements.

¹⁰¹A K M A Quader and Edmond Gomes, “An Exploratory Review of Bangladesh Gas Sector: Latest Evidence and Areas of Further Research,” *CPD Occasional Paper Series 17* (2002).http://www.cpd.org.bd/pub_attach/op17.pdf accessed on July 12, 2017.

¹⁰²Reajmin Sultana, “Application of Environmental Accounting Reporting Practices and Problems Regarding the Presentation of it in Bangladesh (A Case Study on Fossil-fuel Sector),” *European Scientific Journal* 13, no.2 (2017):348-361.

2. Secondly, this research explores the explicit usage and interpretation of the concept of “sustainable development” in the laws of Bangladesh related to petroleum operation and to explain how the international concept is being viewed and treated through the domestic legal framework.

These are the areas of inquiry that this research has explored into in the course of its discussion and it expects that it may initiate legal and policy reforms in Bangladesh and may provide some informed and well-tested guideline for various stakeholders, policy makers and politicians in their efforts for a well-balanced reform in law and policy on sustainable extraction of natural gas for the greater benefit of Bangladesh. Indeed, these are crucial for the national economy of Bangladesh in terms of creating conditions for the effective management of natural gas sector in accordance with modern international concepts of sustainable development.

1.8 RESEARCH QUESTIONS

Review of the existing literatures related to the extraction and development of natural gas dealt with either economic or technical aspect. There is merely any complete work in the domain of legal analysis. On the other hand the articles concerning sustainable development do not consider the aspect of natural gas. Moreover, the environmental issues have not been considerably addressed as the key factor for the sustainable development.

The following research questions guide this research:

1. To what extent do policies, laws and regulations of Bangladesh concerning natural gas operation take into account the principles of sustainable development?
2. What are the major challenges in the way of environment friendly natural gas operation in Bangladesh?
3. How far are the international environmental obligations incorporated in the national legislation concerning natural gas operation?
4. How do some of the selected developing countries of the world face the challenges of their own petroleum sector?
5. To what extent are Bangladesh’s environmental commitments met in the gas industry?
6. What kind of reform can be introduced in the legal framework to conduct the sustainable natural gas extraction in Bangladesh?

1.9 RESEARCH OBJECTIVES

The main objective of this study is to examine how the concept of sustainability is articulated, interpreted, and implemented in domestic laws and regulatory framework of Bangladesh with respect to the natural gas exploration and production; and it attempts to find out a more

suitable regulatory framework for upstream operation of natural gas in Bangladesh. Therefore the specific objectives are:

1. To evaluate the principle of sustainability in the existing policies, laws and regulations of Bangladesh regarding natural gas.
2. To find out the compliance of gas industry in Bangladesh with the international environmental commitment and to compare it with some of the petroleum producing countries of the world.
3. To identify the legal and policy obstacles at the national, regional and international levels that hinder the sustainable exploration and production of natural gas in Bangladesh.
4. Try to make some recommendations on policy and legal reformations that take into account both profitability requirements and commitments to sustainable development.

1.10 METHODOLOGY

The scope of this study encompasses qualitative research of an analytical and comparative nature. Qualitative research is defined as, ‘the interpretative study of a specified issue or problem in which the researcher is central to the sense that is made’.¹⁰³ In this line the study examines the petroleum policies, laws and production sharing contract to determine the sustainability of the exploration and development of natural gas. According to Kirk and Miller, qualitative research methodology has been identified in social science and other disciplines as the naturalistic approach, as the research is conducted in its natural context.¹⁰⁴ Webley found the application of qualitative legal research and defined it as the case-based method of establishing the law through analysis of precedents. It is in fact a form of qualitative research using documents as source material.¹⁰⁵ Considering this, the researcher has examined the rationale of relevant case decisions also.

1.10.1 Research Approach

According to Salter and Mason¹⁰⁶ legal research and thesis often involve hybrid methods and it is hard to categorise these researches under any particular single heading. However, there is a need of utilising standard methods and methodology in order to answer the research

¹⁰³ Peter Banister et al., *Qualitative Methods in Psychology: A Research Guide* (Open University Press, 1997), 2.

¹⁰⁴ Jerome Kirk and Marc L. Miller, *Reliability and Validity in Qualitative Research*, (SAGE, 1986), 9.

¹⁰⁵ Lisa Webley, “Qualitative Approaches to Empirical Legal Research,” *The Oxford Handbook of Empirical Legal Research* (eds) Peter Cane and Herbert M. Kritzer, (Oxford: Oxford University Press, 2010), 927. DOI: 10.1093/oxfordhb/9780199542475.013.0039 accessed on July 6, 2017.

¹⁰⁶ Michael Salter and Julie Mason, *Writing Law Dissertations: An Introduction and Guide to the Conduct of Legal Research* (Pearson, 2007), 31.

questions.¹⁰⁷ In the same line, this study mainly follows two approaches, namely the analytical and comparative approach.

1.10.1.1 Analytical approach

The legal concepts, issues and problems underlying the sustainable extraction of natural gas in Bangladesh are analysed in their functional context and practical sense rather in legalistic and doctrinal terms. The study examines the current context of contractual practices and policy issues considering the changing attitudes of some petroleum producing countries towards the protection of environment and sustainability of the natural gas extraction and development.

1.10.1.2 Comparative method

Basic nature of comparative law is to compare the various legal systems. It is also termed as comparative legal system.¹⁰⁸ The current world is globally linked and researchers are showing interest in comparative law to meet the needs of comparing different legal systems. The thesis incorporates a comparative approach as a method of research rather than as a methodology. Such an approach is adopted not to focus on the research questions on comparing legal systems; rather, this study uses comparative law as a method of measuring whether the sustainability concept has been incorporated in the contracts.

Collins¹⁰⁹ suggested that objective of comparative law should be to improve understanding of one's own national legal system by examining how other countries have faced the same problem. Therefore, the discussion is, to some extent, based on a comparative analysis, using various Model Production Sharing Contracts of Bangladesh and regulations in other jurisdictions.

1.11 SOURCES OF DATA

Data is collected from primary and secondary sources. In the first case, the data is directly collected from the respondents through key informant interviews. Therefore the relevant Acts, rules, regulations, model production sharing contracts, judgement and international instrument are also included as primary sources; whereas in the second case, the main sources are published and

¹⁰⁷Henn et al. state that 'method refers to the range of techniques that are available to us to collect evidence about the social world. Methodology, however, concerns the research strategy as a whole'. For details see Matt Henn, Mark Weinstein and Nick Foard, *A Critical Introduction to Social Research* (2nd ed., SAGE, 2006), 10.

¹⁰⁸ Stephen. C. Hicks, "The Jurisprudence of Comparative Legal Systems", *Loyola of Los Angeles International and Comparative Law Review*6(1983): 83-102. <http://digitalcommons.lmu.edu/ilr/vol6/iss1/4> accessed on September 10, 2017.

¹⁰⁹ Hugh Collins, "Methods and Aims of Comparative Contract Law", *Oxford Journal of Legal Studies* 11 no. 3 (1991): 396-406.

unpublished materials. This is often called library research as well.¹¹⁰ Bearing importance, the secondary data is used from different relevant publications, books, dissertations, journal articles, reports, newspaper articles, web contents and various documents of relevant institutions. After selecting the data collection sources, comes the selection of data-collection method which is largely dependent on the research questions, directing to the research strategy that best fits the research objectives.

1.11.1 Interview

The interview method is a kind of verbal technique of obtaining data. It is the most appropriate and commonly used technique for revealing information. It is a direct method of data collection.¹¹¹ Webley states that “Individual and group interviews provide researchers with access to others' (memories of) experiences and perceptions”. Interviews are usually conducted face-to-face or remotely (via telephone or video link).¹¹² Qualitative researchers are using individual interviews extensively to examine legal phenomena, and perceptions of law and the legal profession.¹¹³

1.11.1.1 Key informant interviews

Key informant interview is defined as the qualitative in-depth interviews with key persons in the relevant field of research and/or policy makers. The objective of such interviews is to collect information from different persons with first-hand knowledge about the community including community leaders, professionals, or residents.¹¹⁴ The proposed area of research is a specialised field. So, there is a need of opinions from different experts. This is done through key informant interviews.

In the research, 17 people are interviewed focusing on a list of issues regarding the topic with a view to obtaining qualitative description of perceptions or experiences, rather than measuring aspects of the experience. The study uses purposive sampling method. So, the respondents in this study are selected considering their experience, knowledge and relevant attachment with the natural gas and energy sector of Bangladesh. To this purpose experts and scholars in the field of energy and minerals resources have been interviewed along with

¹¹⁰Manju Koolwal, “Collection and Analysis of Data in Legal Research,” *Journal of the Legal Studies* 38 (2008): 290-99.

¹¹¹B.N. Ghosh, *Scientific Method and Social Research* (New Delhi: Sterling Publishers Private Limited, 1982), 190.

¹¹²Webley, “Qualitative Approaches,” 937.

¹¹³Hilary Sommerlad, “Researching and Theorising the Processes of Professional Identity Formation,” *Journal of Law and Society* 34 no. 2 (May, 2007): 190-217. Margaret Thornton, *Dissonance and Distrust—Women and the Legal Profession*, (Oxford: Oxford University Press, 1996).

¹¹⁴“Key informant Interviews”http://healthpolicy.ucla.edu/programs/health-data/trainings/Documents/tw_cba23.pdf. accessed on July 25, 2017

officials from petroleum sector and stakeholders¹¹⁵ at different levels. A semi-structured interview method has been followed in this study. Semi-structured interview is considered as the most useful interview format and it is not highly structured. Such interviews offer topics and questions to the interviewee, however they are carefully structured to extract the interviewee's ideas and opinions on the topic of interest i.e. the interviewee is not simply allowed to talk freely about whatever comes up. The ideas and opinions rely on the interviewer following up with probes to get in-depth information on topics of interest. Zorn suggested two underlying principles in this regard “(1) strive to avoid leading the interview or imposing meanings and (2) strive to create relaxed, comfortable conversation.”¹¹⁶ The interviews were conducted face to face by using tape recorder with the consent of the interviewee. The goal of the interview was not to aggregate data across respondents, rather to explore things like similarities and differences. Their valuable comments not only have enriched the content but also helped to clarify different relevant issues.

1.11.2 Case Studies

Yin states a case study as “an empirical study that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident”. Yin describes that case studies are best used to answer “how” and “why” questions through in-depth analysis of one situation, event or location. Case-study research is designed to focus in detail on a given situation rather than to provide findings that are generalisable to other situations.¹¹⁷ In this study a number of production sharing contracts made between Petrobangla and different IOCs are considered as case studies to answer the question whether the sustainable development concept has been considered in the signed contracts. The researcher examines how far these contracts are compatible with the domestic laws and international instruments and tries to answer why this issue is not considered in the contract(s).

1.11.3 Document Analysis

Document analysis is a useful method of obtaining data in different forms such as the official or personal, the text-based and the image-based. Generally documents provide evidence of

¹¹⁵ Stakeholders are those who have an interest in a particular decision either as individuals or representatives of a group. This includes people who influence a decision or can influence it as well as those affected by it. See for details Minu Hemmati, *Multi-Stakeholder Processes for Governance and Sustainability*, (Earthscan Publications, 2002), 250.

¹¹⁶ Ted Zorn, “Designing and Conducting Semi-Structured Interviews for Research” <http://home.utah.edu/~u0326119/Comm4170-01/resources/Interviewguidelines.pdf> accessed August 20, 2017.

¹¹⁷ Robert K. Yin, *Case Study Research: Design and Methods* (5th edn.), (SAGE Publications, 2014), 13..

policy, direction, legislative intent, understanding of perceived shortcomings or best practice of the legal system and agenda of change to the researchers.¹¹⁸ This study is focused on the substance of the document rather than the context. Qualitative document analysis is applied largely in this research as a method for relevant data collection.

1.12 DATA COLLECTION METHOD

Policy makers, academicians, concerned government officials, experts in the field of energy and environment and petroleum engineers conducting petroleum operations in Bangladesh took part in the in-depth semi-structured interviews of this research. A total of 17 key persons were interviewed out of which 6 respondents gave their opinion through e-mail, 7 respondents participated in face to face interview and 3 interviews were conducted through telephone conversation. 1 respondent gave his opinion both face to face and in written form. The face to face interviews and interviews conducted through telephone conversation were recorded with their consent through cell phone and lasted from 45 minutes to 1 hour. Most of the face to face interviews were conducted in the work place of the respondents. All participants were informed that the information will be used for research purpose only and the confidentiality will be maintained. The five major groups the respondents are selected from as academicians, energy experts, government officials, petroleum engineers and environment experts. For brevity, the respondents of this research are presented under the following heads.

1.12.1 Academician

Academics from various fields, such as petroleum and mineral resources engineering, law and environment, from Bangladesh University of Engineering and Technology, University of Chittagong, University of Dhaka, Jahangirnagar University, University of Rajshahi, and Shahjalal University of Science and Technology took part in the interviews. Here the academicians are coded as AC.

1.12.2 Energy Expert

The renowned energy experts from the country who are also the academicians in various disciplines from University of Dhaka, Jahangirnagar University, Bangladesh University of Engineering and Technology and energy activists who played very significant role in various energy movements in Bangladesh are here represented as the Energy experts. Here energy experts are coded as EP.

¹¹⁸Webley, "Qualitative Approaches," 938.

1.12.3 Government Official

High officials from Ministry of Power, Energy and Mineral Resources, Petrobangla, Bangladesh Energy Regulatory Commission (BERC) are selected as Government Officials (GO). It is significant that most of the GOs were reluctant to give their opinion and to express their actual views because they were concerned with their job security. Though they were assured that their identity would be protected, they are not interested as they thought it might create unexpected trouble in their service lives.

1.12.4 Environment Expert

Experts specialising in environment were selected as environment experts. Environment experts are coded as ENV.

1.12.5 Petroleum Engineers

Engineers who have served as petroleum engineers from the beginning of their career and worked in government and international oil companies are considered as petroleum engineers in this study. Here the petroleum engineers are coded as the PE.

The list of the respondents and the mode of conducting the interview is provided in Table 1.1.

Table 1.1 Details of Interview

Categories of Respondents	Number of Respondents	Mode of Interview
Academic	5	3 respondents provided their opinion through email, 1 through face to face interview and 1 through telephone conversation.
Energy Expert	5	2 respondents provided their opinion through face to face conversation, 1 through email, 1 through telephone conversation and 1 through both email and face to face conversation.
Government Official	4	2 through face to face interview, 1 through email and 1 in written form.
Petroleum Engineer	1	Through face to face interview.
Environment Expert	2	1 interview conducted face to face and the other through telephone conversation.

1.13 DATA ANALYSIS METHOD

Drawing conclusions and findings by analysing obtained data are among the more contentious aspect of qualitative research.¹¹⁹ In this study the data obtained from document analysis, interview and case studies are thoroughly scrutinised and reviewed. The researcher has edited out the inconsistencies, if any. The data is analysed through inductive reasoning process for drawing appropriate inference. In this study the researcher has opted for the content analysis process. The researcher has categorised the raw data first, on the basis of themes, as the development of theme is an integral part of data analysis and the researcher organise the raw data based on theme.¹²⁰ After that, the themes were analysed setting some parameters which were then coded; as “codes are tags or labels for assigning unit of meaning to the descriptive or inferential information compiled during a study.”¹²¹ Qualitative coding is an integral part of data analysis as through coding the researcher is allowed to retrieve the relevant part of the manageable data.¹²² The researcher has examined the data to condense the themes into preliminary analytical categories or code. Finally, the findings are presented in descriptive form of presentation.

All the information extracted through interview is then transcribed in full text. Standard methods of data analysis such as coding and categorising, looking for emerging themes and patterns according to Giorgi’s¹²³ phenomenological analysis in four stages: (a) reading the material to get a sense of the whole; (b) read the same descriptions more slowly and identify different meaning representing different aspects of sustainable operation of natural gas and coding these; (c) abstracting the theme within each of the coded groups; and (d) summarising the contents of each code group to generalise descriptions reflecting the most important elements in the informants opinion as to challenges of sustainable natural gas operation in Bangladesh. Confidentiality has been ensured, as only the researcher and her supervisor had access to the interviews. Six indexes are used as indicators of sustainable natural extraction that is drawn by the researcher in second chapter. There was a general question as to the perception of sustainable development and natural gas extraction that was not within the six indexes and was first discussed to depict the concept of sustainability of different professionals. Finally, their opinions are discussed to evaluate the implementation of

¹¹⁹Webley, “Qualitative Approaches”, 940.

¹²⁰Neuman, *Social Research Methods*, 460

¹²¹ Mathew B. Miles and A Michael Huberman, *Qualitative Data Analysis*, 2nd ed. (CA: Thousand Oaks, SAGE, 1994), 56 cited in Neuman, *Social Research Methods*, 460.

¹²²Neuman, *Social Research Methods*, 460

¹²³ Amedeo Giorgi, “Sketch of a Psychological Phenomenological Method,” in *Phenomenology and Psychological Research*. Amedeo Giorgi (Duquesne: University Press, Pittsburg, 1985).

sustainable development in natural gas operation from various perspectives. This is done through triangulation method. Triangulation is the idea of looking at something from multiple points of view to improve the accuracy.¹²⁴ Looking at something from several angles provides better understanding than to look from a single angle or only in one way.¹²⁵ This is why the researcher has selected the experts from different profession of the relevant sector to understand their thoughts regarding the sustainable natural gas operation from several points of view.

1.14 LIMITATIONS

Sustainable upstream operation of natural gas in Bangladesh covers a wide range of area. But the study limits itself by focusing on the onshore operations. The researcher does not take into account the offshore extraction. The study does not cover the downstream operations though many environmental hazards occur in this phase. The researcher had limited access to the global resources regarding this field and the study is limited within the accessible resources.

1.15 THESIS STRUCTURE

The thesis is divided into six chapters. Organisation of the thesis and a very brief overview of the chapters are presented below.

Chapter One (Introduction): It is a general introduction chapter. It introduces the research problem and rationale of the study, demonstrates the research methods to be utilised for the thesis, and briefly indicates the outline of the thesis. Review of existing literatures pertaining to the petroleum operation in Bangladesh are also summarised in this chapter.

Chapter Two (Concept of Sustainable Development in Natural Gas Sector): This chapter represents the progressive development of the concept of sustainable development and its relation with natural gas extraction and finds some indicators for sustainable natural gas extraction.

Chapter Three (Existing Legal Structure of Natural Gas Exploration in Bangladesh): This chapter assesses the sustainable development concept in the existing policies, laws, regulation and the institutional frameworks of natural gas extraction in Bangladesh.

Chapter Four (Model Production Sharing Contract: A Case Study of Bangladesh): This chapter critically analyses the MPSCs of Bangladesh and represents comparison between MPSC and actual contracts.

¹²⁴W. Lawrence Neuman, *Social Research Methods: Qualitative and Quantitative Approach*, 6th ed. (New York: Pearson International Edition, 2006),149.

¹²⁵Ibid.

Chapter Five (Compliance with International Environmental Commitments): This chapter examines the implementation of sustainable development concept in natural gas operation and the opinion of experts extracted through interview are analysed and discussed.

Chapter Six (Conclusion and Recommendation): Concluding remarks of this study is presented in this chapter. Recommendation for policy and legal reform based on the study is suggested. Further study in this research area is also recommended in this chapter.

CHAPTER TWO

NATURAL GAS EXTRACTION AND THE CONCEPT OF SUSTAINABLE DEVELOPMENT

The aim of this chapter is to present the progressive development of the concept of sustainable development and its relation with natural gas extraction and find some indicators for sustainable natural gas extraction.

2.1 INTRODUCTION

The world has been facing great global challenges including, natural resource depletion, adverse impacts of environmental degradation and climate change. These are some of the problems that are putting the survival of societies and the planet itself at risk.¹²⁶ In the international context, sustainable development is considered as one of the most important tools to face all these problems. This concept has been accepted worldwide and is included in various international legal instruments such as the “Our Common Future: Report of the World Commission on Environment”, known as the Brundtland Report,¹²⁷ and the Rio Declaration on Environment and Development¹²⁸, the Johannesburg Declaration on Sustainable Development: From Our Origins to the Future¹²⁹, the Future We Want (Rio+20 Declaration)¹³⁰ and Transforming our world: the 2030 Agenda for Sustainable Development.¹³¹

The concept of sustainable development is a combination of social, economic and environmental aspects, and what really is in a discussion is the weight of each pillar. The definition of sustainable development is not yet agreed politically or accepted scientifically.

¹²⁶ Sustainable Knowledge Platform, “Transforming Our World: the 2030 Agenda for Sustainable Development,” <https://sustainabledevelopment.un.org/post2015/transformingourworld> accessed on January 10, 2018.

¹²⁷ United Nations World Commission on Environment and Development (UNWCED), *Our Common Future (Brundtland Report)*, (Oxford: Oxford University Press, 1987).

¹²⁸ United Nations Conference on Environment and Development, Rio de Janeiro (Rio Conference), (A/CONF.151/26, June 1992), Vol. I, Annex I. <http://www.un.org/documents/ga/conf151/aconf15126-1.htm> accessed December 08, 2017.

¹²⁹ World Summit on Sustainable Development (Johannesburg Summit), (A/CONF.199/20, September 2002), Chapter 1, Resolution 1. <https://sustainabledevelopment.un.org/milestones/wssd> accessed September 12, 2018.

¹³⁰ United Nations, Outcome Document of the United Nations Conference on Sustainable Development (Rio+20 Conference) Rio de Janeiro, Brazil, 20–22 June 2012 <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf> Accessed January 9, 2018.

¹³¹ Sustainable Knowledge Platform, *Transforming Our World: the 2030 Agenda for Sustainable Development*

However, it remains persistent as an ideal political concept, similar to democracy, justice, and liberty¹³². Some scholars equate it with democracy considering its universal desirability, diverse understanding, difficulty to achieve and its persistence.¹³³ However, the definition of sustainable development given by the Brundtland Commission is the most cited definition in literature.

This chapter represents an overview of the concept of sustainable development, describing the process of evolution of the concept from initial ideas concerning sustainability in the environment to today's more comprehensive and profound understanding of sustainable development. This chapter also goes through the concept, its principles, the core international legal instruments and international reports on sustainable development to analyse its different aspects for implementation in the extraction of natural gas. The concept of sustainable development demands countries worldwide to use their natural resources rationally while aiming at their economic development and taking into account the quality of the environment as a determinant of their society's welfare. Therefore, the chapter helps to understand the breadth of sustainable development and to specify ways in which sustainable development in today's natural gas industry could be achieved.

2.2 EVOLUTION OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Generally, people are reluctant about and forget the evolution of sustainable development. However, it can help foresee the coming trend that will appear and assist the globe to ensure 21st century as a century of sustainable development.¹³⁴ Development is the collective process of change to improve the standard of life for mankind and the society, while sustainable development refers to the economic, social and environmentally integrated sound development, able to ensure long-lasting benefit.¹³⁵ The present concept of sustainable development is interconnection among three core principles; environmental, social and economic. The term is not static and it may vary according to time, place or the subject matter.¹³⁶

¹³² James Meadowcroft, "Who is in Charge Here? Governance for Sustainable Development in a Complex World," *Journal of Environmental Policy and Planning* 9 no.3-4 (November 2010): 299-314.

¹³³ William M. Lafferty (ed.) *Governance for Sustainable Development. The Challenge of Adapting Form to Function* (Cheltenham: Edward Elgar, 2004).

¹³⁴ John Elkington, *Cannibals with Forks, the Triple Bottom Line of the 21st Century* (Oxford: Capstone, 1997), 18.

¹³⁵ Marie-Clarie Cordonier Segger and Ashfaq Khalfan, *Sustainable Development Law: Principles, Practices & Prospects* (Oxford: Oxford University Press, 2004).

¹³⁶ Virginie Barral, "Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm," *The European Journal of International Law* 23 no. 2 (2012): 377-400.

Early origin of sustainable development can be traced back to the 19th and 18th centuries. Back in 1713, Hans Carl von Carlowitz (1645- 1714), the head of the Royal Mining Office in the Kingdom of Saxony, introduced the idea of sustainable development through these words: “One should harvest only the same amount of wood which equals to trees planted ...”, stressing the importance of the proper management of wood stock to face the challenges of predicted shortage of timber.¹³⁷ Later in 1798, Thomas Malthus also highlighted that the population of our planet is not sustainable, as it increases at an exponential rate compared to the available resources.¹³⁸ Similar realisation was in 1893 in the Pacific fur seal arbitration case where the over exploitation of fur seal was the matter of concern between the United States and Britain. In this case the US alleged that Britain was over exploiting the fur seals. The award was granted in favour of Britain while regulation was adopted to protect the fur seals.¹³⁹ Then a number of treaties, multilateral and bilateral agreement, and conventions were adopted where the concept of sustainability was incorporated explicitly or impliedly. Later the principle of the *fur seal case* was directly incorporated in recommendation 32 of the Stockholm Declaration. In 1916 a convention was adopted between the United States and Canada for the protection of migratory birds. The preamble of the whaling convention 1946 recognises the “interest of the nations of the world in safeguarding for future generations the great natural resources represented by the whale stock”.¹⁴⁰ Thus the evolution of sustainable concept was based on the close connection between the preservation of nature and economic development, which is at the heart of sustainable development. In 1972, India’s Prime Minister, Indira Gandhi, pointed out a relation between high-level poverty in the world and the environmental degradation and held the developed world responsible for their over exploitation of natural resources to fulfil their own requirement.¹⁴¹ The concept of sustainable development has been being developed for several decades. There were warnings from various corners of society, including local, national, regional and international authorities, that if we continued our present consumption trends, we could find ourselves in trouble.

¹³⁷Klauss Bosselmann, *The Principle of Sustainability: Transforming Law and Governance* (Taylor & Francis, 2016), 17-22 and Giorgos Goniadis and Maria Lampridi (eds), *Introduction to Sustainable Development* (International Hellenic University, 2015), 29-34.

¹³⁸Barral, “Sustainable Development,” 377-400.

¹³⁹ Philippe Sands, *Principle of International Environmental Law*, (Cambridge: Cambridge University Press, 2003), 29.

¹⁴⁰ International Convention for the Regulation of Whaling 1946, pmbl, <https://europa.eu/capacity4dev/public-environment-climate/documents/international-convention-regulation-whaling-washington-1946>, access on 15 12 2019.

¹⁴¹ Global Development Professionals Network, “Climate Change and Poverty: Why Indira Gandhi's Speech Matters” *The Guardian*. 2015. <https://www.theguardian.com/global-development-professionals-network/2014/may/06/indira-gandhi-india-climate-change> accessed on October 10, 2017.

However, there are controversies on the historical development of sustainable development. According to Yana et. al.¹⁴², in 1972 an early definition of the concept of sustainable development was provided in a book entitled the “Limit of Growth” which was published by an inventive organisation, ‘The Club of Rome’ which associated, for the first time, ecology and economy in the demographic growth.¹⁴³ Considering global ecological problems, it is evident that growth of the economy, which is based on the over use of natural resources, leads to irrevocable environmental harm. In 1977 W. Ophuls, an American jurist, used the term ‘steady state society’ instead of sustainable development in one of his works. During the same period, Canadian economist J.M. Hartwick offered the provision of compensation for the depletion of natural capital by acreage rent method as the income of rent should be utilised not only by current but also by the future generations.¹⁴⁴ In all cultures of the world, the deep root of the theme of sustainability is found.¹⁴⁵ However, Sustainable development is now a vital issue in an immense number of Resolutions, Declarations, Conventions and International judicial decisions. However, there is always a confusion regarding its ambiguous or vague nature.¹⁴⁶ The judgement of the Gabikovo-Nagymaros Project (HungaryVs Slovakia in 1997) case is one of the striking points on the concept of sustainable development. In this case, environmental problem was a direct issue before the International Court of Justice (ICJ) and, the majority of the Bench recognised the sustainable development concept and stated that this “new standard” had substantial contemporary relevance. Emphasising the newly developed standard of the environmental law the ICJ decided the “need to reconcile the economic development with protection of the environment is aptly expressed in the concept of sustainable development.”¹⁴⁷ The court observed that the vulnerability of the environment and environmental risks had to be assessed regularly.¹⁴⁸ The ICJ also observed that new norms and standard had been developed due to the growing

¹⁴² Yana V. Shokola et al., “Innovative and Sustainable Development of Oil and Gas Complex,” In Proceedings of *IEEE NW Russia Young Researchers in Electrical and Electronic Engineering Conference*, 2017.

¹⁴³ Donella H. Meadows et al., *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (New York: Universe Books, 1972).

¹⁴⁴ John M. Hartwick, “Intergenerational Equity and the Investing of Rents from Exhaustible Resources,” *American Economic Review* 67 no.5(1977): 972-974. Cited in SebastienSauve Sophie Bernard and Pamela Sloan, “Environmental Sciences, Sustainable Development and Circular Economy: Alternative Concepts for Trans-disciplinary Research” *Environmental Development* 17 (2016) 48–56.

¹⁴⁵ DestaMebratu, “Sustainability and Sustainable Development: Historical and Conceptual Review,” *Environmental Impact Assessment Review* 18 no.6 (1998): 493-520.

¹⁴⁶ Barral, “Sustainable Development,” 377-400.

¹⁴⁷ Sands, *International Environmental Law*, 254-255

¹⁴⁸ Abdullah Al Faruque, *Environmental Law: Global and Bangladesh Context*, (Dhaka: New Warsi Book Corporation, 2017), 42-44.

awareness of risks for mankind and present and future generation.¹⁴⁹ This judgement was a milestone for judicial recognition of the concept of sustainable development through ICJ, and the observation of court regarding new norms and standard address the term sustainable development.

2.3 DEVELOPMENT OF THE CONCEPT OF SUSTAINABLE DEVELOPMENT

The concept of sustainable development and its objectives historically emerged through a number of international conferences and agreements. Though the term sustainable development was not directly used in these conventions or agreements, the same was reflected through the term's rational or proper utilisation and management, wise use, appropriate or sound environmental management, rational use of natural resources etc.¹⁵⁰ Rational utilisation and management has been used as standard in a number of conventions such as Western Hemisphere Convention 1940, Danube Fisheries Convention 1958, North Atlantic Fisheries Convention 1959, African Conservation Convention, Antarctic Seals Convention 1972, and Amazonian Treaty of 1978 for hydro resources.¹⁵¹ The milestone of the sustainable development was founded in the Stockholm declaration by integrating the concept of development and environment. However, before the Stockholm Conference, the concept was incorporated through the term conservation and development which was first used in the 1949 United Nations Conference on Conservation and Utilisation of Resources.¹⁵² This conference addressed six main areas such as minerals, fuel and energy, wildlife, water, forest and land. Though the conference covered six issues, its primary focus was the condition of the world resources, review of the world resources to determine the critical shortage, resource management techniques for less developed countries, the mutual dependence of the resources, utilisation and preservation of resources, learning for conservation, new resources development through technology and the river basins development. The importance of use and development of natural resource or minerals sustainably was a matter of concern much before the idea of sustainable development began its official run. The proper utilisation and management were referred to in the preamble of the agreement for the General Fisheries Council for Mediterranean 1949 and the Latin American Forest Institute's agreement in 1959.¹⁵³ Thereafter the history witnessed a transition from the

¹⁴⁹Sands, *International Environmental Law*, 254-255.

¹⁵⁰ Sands, *International Environmental Law*, 265.

¹⁵¹Ibid, 260-261.

¹⁵²UNCCUR Proceedings, vol 1: Plenary Meetings(E/Conf.7/7) cited in Sands, *International Environmental Law*,32

¹⁵³Sands, *International Environmental Law*, 261.

conservation of the environment in 1972 to an integrated economic, social and environmental development in Rio Declaration in 1992.

2.3.1 United Nations Conference on the Human Environment 1972

The origin of sustainable development is found in 18th and 19th centuries recognising a close relationship between the preservation of nature and economic development. The Stockholm Conference on the Human Environment held in 1972 is said to be the official beginning of sustainable development. The term ‘sustainable development’ was not mentioned in the Stockholm Declaration; however, the connection between the protection of environmental and economic development was clearly established in its principles.¹⁵⁴ In the global level, the Stockholm Conference was the first to deal with only environment-related issues. The outcomes of the conference were three non-binding instruments: a Declaration¹⁵⁵ which contains 26 Principles “to inspire and guide the peoples of the world in the preservation and enhancement of the human environment”¹⁵⁶, a resolution on institutional and financial arrangements the outcome of which was the establishment of the United Nations Environmental Programme (UNEP) with the mission “to provide leadership and encourage partnership in caring for the environment by inspiring, informing, and enabling nations and peoples to improve their quality of life without compromising that of future generations”,¹⁵⁷ and an Action Plan containing 109 recommendations in six main subject areas.¹⁵⁸ Despite its non-binding nature, the Declaration was legally very significant. The Declaration of the Stockholm Conference established the basic rules of international environmental law, which refers to the balance between environmental protection and economic development. The principles 2 and 4 comprise all the components to protect the biosphere. While the States have a sovereign right to use their natural resources, they must ensure that it does not leave any adverse effect on the environment of neighbourhood States.¹⁵⁹ The adoption of the principles 21 and 22, broadly the principle of “good neighbourliness”, was a significant achievement of this Conference which claims that “States shall cooperate to develop further

¹⁵⁴ Barral, “Sustainable Development,” 377-400.

¹⁵⁵ United Nations Environment Program (UNEP), ‘Report of the U.N. Conference on the Human Environment’ (1972) A/CONF.48/14 <https://undocs.org/en/A/CONF.48/14/Rev.1> accessed March 18, 2018.

¹⁵⁶ *ibid.*

¹⁵⁷ *ibid.*

¹⁵⁸ the six areas are (a) Planning and management of human settlements for environmental quality;(b) Environmental aspects of natural resources management;(c) Identification and control of pollutants of broad international significance;(d) Educational, informational, social and cultural aspects of environmental issues;(e) Development and environment; and(f) International organisational implications of action proposals. UN Conference on the Human Environment, “Stockholm Declaration,” (16 June 1972). UN Doc A/Conf 48/14/Rev.1 accessed on June 11, 2018.

¹⁵⁹ Stockholm Declaration, Principle 21.

the international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of such States to areas beyond their jurisdiction.”¹⁶⁰ This develops the polluter pays principle. The Declaration also ensures maximum benefit to the people, proposing that the States should integrate economic development with protection of the environment.¹⁶¹

The term sustainable development started its journey from Stockholm declaration and in principles 1, 2 and 5 the responsibility to protect the earth for the benefit of the future generation was directly adopted. Principle 5 clearly states that “The non-renewable resources of the earth must be employed in such a way as to guard against the danger of their future exhaustion and to ensure that benefits from such employment are shared by all mankind”. By this principle the conservation of natural resources and intergenerational equity was ensured. Though a number of principles and recommendations were made to protect the environment and the relation between environment and development was emphasised, no provision was made to ensure the conservation and management of energy or petroleum, the key component of economic development. However, some critics think that some limitations were found in the effectiveness of the conference, because the protection of environment and development, particularly the need for development in developing world were considered as a challenging need. As a result, it was dealt in an uncoordinated way. Prizzia concluded that “the conference provided more emphasis to find out the trade-off between the environment and development rather than to make a reciprocal harmonious relationship between these two aspects”¹⁶². The relation between environment and development was the primary concern of the Stockholm Conference though there are arguments that economic growth and the environment have neither a positive nor a negative relationship since high economic growth may not adversely affect the environment. On the contrary, low or negative economic growth causes environmental degradation and depletes the stock of non-renewable resources.¹⁶³

2.3.2 Brundtland Commission on Environment and Development

The Brundtland Commission, named in honour of its Chair, Gro Harlem Brundtland was formed in 1983 at the UN General Assembly as the World Commission on Environment and Development. The concept of sustainable development was introduced in this Brundtland

¹⁶⁰Ibid. 22.

¹⁶¹ Ibid., Principle 13

¹⁶²Prizzia Ross “Sustainable Development in an International Perspective,” in *Handbook of Globalization and the Environment*, edsKhi V. Thai, Dianne Rahm and Jerrel D. Cogburn (Boca Raton: CRC Press, 2007), 21.

¹⁶³Ragnar Rosness et al., “Environmental Condition for Safety Work-Theoretical Foundation,” *Safety Science* 50, no. 10 (2012):1967-1976.

report. The Report aimed to inspire the world community to make urgent progress towards economic development but under conditions of rational exploitation of natural resources and preserving the environment. The foreword of the Brundtland Report clearly states the main intention: “What is needed now is a new era of economic growth –growth that is forceful and at the same time socially and environmentally sustainable”.¹⁶⁴ The most commonly quoted definition of sustainable development is provided through the report and acts as a guide for the international community and their future activities for economic, social and environmental development. The most renowned definition of sustainable development provided by the Brundtland Commission report is “sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. This definition is also considered “politically significant”.¹⁶⁵ The concept of sustainable development from this report is incorporated in a number of major national, regional and international legal documents, and the international tribunals also addressed many economic, social and environmental problems with due regard to sustainable development perspective.¹⁶⁶ The report incorporated the principle of the intergeneration equity by referring to the conservation provision for future generation and intra-generational equity through proper distribution of the outcome of the development. The commission also observed that the ability of the future generation is compromised through over-exploitation of natural resources.¹⁶⁷ Hence Brundtland report recognised the relationship between the energy and developments through the statement “The ultimate limits to global development are perhaps determined by the availability of energy resources and by the biosphere's capacity to absorb the by-products of energy use. These energy limits may be approached far sooner than the limits imposed by other material resources. First, there are the supply problems: the depletion of oil reserves, the high cost and environmental impact of coal mining, and the hazards of nuclear technology. Second, there are emission problems, most notably acid pollution and carbon dioxide build-up leading to global warming.”¹⁶⁸ Therefore,

¹⁶⁴ United Nations Commission on Sustainable Development (UNCSD), “Framing Sustainable Development: The Brundtland Report – 20 Years On” (2007).
https://www.un.org/esa/sustdev/csd/csd15/media/backgrounder_brundtland.pdf accessed on March 19, 2018.

¹⁶⁵ Bac Dorin Paul, “A History of the Concept of Sustainable Development: Literature Review,” *The Annals of the University of Oradea* 17, no. 2 (2008): 576- 579.
<http://www.cfr.washington.edu/classes/esrm.458/Paul.%202008.pdf> accessed on February 12, 2018.

¹⁶⁶ Erling Holden, Kristin Linnerud and David Banister, “Sustainable Development: Our Common Future Revisited,” *Global Environmental Change* 26 (May 2014): 130–139.

¹⁶⁷ Brundtland Report, United Nations World Commission on Environment and Development, Chapter two, Towards Sustainable Development

¹⁶⁸ Ibid.

efficient use and conservation of energy are essential for sustainable development as the energy use pattern of the industrialised and developed world is neither feasible nor desirable.¹⁶⁹ Although the concept of sustainable development was not coined through Brundtland report, it really came into fashion through the report. However, in this report, sustainable development was expressed as a changing process where the resource exploitation, investment direction, technological development and institutional change are all in harmony and increase both current and future prospective to meet human needs and aspirations. Finally it was concluded with the aspiration of integrated approach to address environmentally sound sustainable economic development in both developed and developing world.¹⁷⁰

2.3.3 The United Nations Conference on the Environment and Development 1992

In 1992, The UN Conference on the Environment and Development (UNCED) was held in Rio de Janeiro, Brazil following the Brundtland report. The Conference is known as the Earth Summit or the Rio Summit and it was 20th anniversary of the 1972 Stockholm Conference. The principal focus of the conference was “to elaborate strategies and measures to halt and reverse the effects of environmental degradation in the context of increased national and international efforts to promote sustainable and environmentally sound development in all countries”.¹⁷¹ In fact, the word sustainable development achieved its worldwide recognition through the Rio conference. The key output of this conference was the Rio Declaration, Agenda 21 and the Commission on Sustainable Development with a mandate to further improvement of international environmental law¹⁷² along with adaptation of the Convention on Biodiversity (CBD)¹⁷³ and the United Nations Framework Convention on Climate Change (UNFCCC)¹⁷⁴.

The Rio declaration comprises 27 principles and there was debate among developing and developed world regarding inclusion of some principles. The industrialised countries demanded for incorporation of principle of access to information, precautionary approach and the polluter pays principle while the developing countries were in position to integrate the

¹⁶⁹ Brundtland Report.

¹⁷⁰ Dinah Shelton, “Stockholm Declaration (1972) and Rio Declaration (1992)” in *Max Planck Encyclopedia of Public International Law* (Oxford: Oxford University Press, 2008).

¹⁷¹ Pamela Chasek, “The Story of the UNCED Process,” in *Negotiating International Regimes: Lessons Learned from the United Nations Conference on Environment and Development* eds. Bertram Irwin Spector and Gunnar Sjostedt and I. William Zartman (eds), (Graham and Trotman 1994), 45.

¹⁷² David A Wirth, “The Rio Declaration on Environment and Development: Two Steps Forward and One Back, Or Vice Versa?” *Georgia Law Review* 29, (1995):599-653.

¹⁷³ Opened for signature on 5 June 1992, entered into force on December 1993.

¹⁷⁴ Opened for signature from 4 to 14 June 1992, entered into force on 21 March 1994, 196 parties.

right to development, eradication of poverty and common but differential responsibility.¹⁷⁵ However, in Rio Declaration, for the first time there was a consensus among the international community regarding the right to development of developing countries through principle 3 of the Rio declaration. However, to appease the developed countries principle 4 states that ‘in order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it’.¹⁷⁶ To meet the demand of the developed states the provision of integration of environmental protection and development (Principle 4), public participation (Principle 10), the precautionary approach (Principle 15), and environmental impact assessment (Principle 17) were incorporated. On the contrary, to satisfy the demand of the developing countries, the provision concerning the right to development (Principle 3), special needs of developing states (Principle 6), common but differentiated responsibility (Principle 7), and poverty alleviation (Principles 5) were included.¹⁷⁷ However, no principle addressing the energy or the petroleum resources was included and a very general provision of production and consumption was introduced stating that ‘to achieve sustainable development and a higher quality of life for all people, states should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies’.¹⁷⁸ The first part of the principle addressed the developed world while the second part, the developing one.¹⁷⁹ Hence, one of the significant contributions of this declaration was the introduction of international law of sustainable development through principle 27. Sands recognises that the contribution of the UNCED will be everlasting as it endorsed, for the first time, a new topic of international law for sustainable development, though its significant part would cover the international environmental law.¹⁸⁰ But there is a threat that the introduction of the international law of sustainable development may decline the autonomy of international environmental law.¹⁸¹

¹⁷⁵Shelton, “*Stockholm Declaration*”

¹⁷⁶ Rio Declaration, United Nations Conference on the Environment and Development (1992)

Principle 4

¹⁷⁷ Alan E Boyle and David Freestone, *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford: Oxford University Press, 2012), 1.

¹⁷⁸ Rio Declaration, Principle 8.

¹⁷⁹Shelton, “*Stockholm Declaration*”.

¹⁸⁰Sands, *International Environmental Law*, 53.

¹⁸¹Marc Pallemearts, “International Environmental Law From Stockholm To Rio: Back To The Future?,” *1 Review of European Community and International Environmental Law*1, no. 3(August 2006): 254-266.

The Rio Declaration of the UNCED was primarily emphasised on the improvement of the relation between environment and development. Though some of the principles of the declaration overlapped with the provision of Stockholm declaration, the language of the Rio Declaration is largely obligatory and distinct from the Stockholm Declaration 1972 as most of the principles start with the instruction ‘States shall...’ rather than ‘States should’.¹⁸² However, the Rio declaration paved the way to implement the concept of sustainable development.

The Agenda 21 of the UNCED was a special outcome comprising 40 chapters, addressing almost all the areas of the sustainable development, which is termed as a comprehensive blueprint for global partnership to reconcile between the high quality of the environment and the healthy economy for the world people.¹⁸³ It provides a road map to the world community to attain the target of sustainable development. However, similar to the Rio Declaration, Agenda 21 also does not contain any chapter concerning energy; though some of the provisions directly or indirectly touch the issue. In fact the exclusion was not an oversight rather it was intentional. As during the preparation for the UNCED, *Caring for the Earth: A Strategy for Sustainable Living* published by the IUCN (The World Conservation Union), UNEP (United Nations Environment Programme) and WWF (World Wide Fund for Nature), emphasised the key role of energy for the wellbeing of mankind and demanded for a complete chapter on energy in agenda 21 of Earth Summit.¹⁸⁴ *Caring for the earth* proposed for the long term energy strategy for all countries, enhanced energy efficiency, and efficient consumption and distribution of energy and urged for explicit laws and policy regarding price of the energy covering social cost, sustainable use of tax and fees and addressing efficient production, distribution and consumption. However, the entire attempt to adopt a chapter in the Agenda 21 went in vain due to the conflict between fuel exporting and importing countries.¹⁸⁵ Section II of Agenda 21 addresses the issue regarding conservation and management of resources for development. A number of issues regarding non-renewable and mineral resources are incorporated in it in a scattered manner. For example, paragraph 70(d) of Chapter 7 states that “All countries should promote information exchange and appropriate

¹⁸² Boyle and Freestone, *International Law and Sustainable Development*, 1.

¹⁸³ United Nations, “Rio Declaration on Environment and Development,” *Report of the Rio Declaration on Environment and Development* (1992).
<https://www.un.org/esa/documents/ga/conf151/aconf15126-1.htm> accessed on April 10, 2018.

¹⁸⁴ IUCN, UNEP, WWF, *Caring for the Earth: A Strategy for Sustainable Living* (Switzerland: Gland, 1991), <https://portals.iucn.org/library/efiles/documents/cfe-003.pdf> accessed January 11, 2018.

¹⁸⁵ Nicholas A. Robinson *Agenda 21: Earth Action Plan* (New York: Oceana Publications, 1993) 34, cited in David R. Hodas, *International Law and Sustainable Energy: A Portrait of Failure*.

technology transfer among all countries, with particular attention to developing countries, for resource management in construction, particularly for non-renewable resource.” It is also expressed that because of the past and present development in production and consumption pattern and life style, energy production and its use adversely affect the human health by pollution of the basic environmental ingredients.¹⁸⁶ Promotion of use of environmentally sound technology in industry and energy sector and sustainable energy in settlement of human being are encouraged.¹⁸⁷ It is explained that the developing countries face the need to accelerate energy production to speed up development and minimising environmental pollution related to energy and its production cost.¹⁸⁸ This Chapter also mentions the provision about the sustainable energy for all country, with a comprehensive view to development of human settlement. It is also stated that to improve the quality of life and social and economic development, energy is essential and the present production and consumption pattern of energy is not sustainable, therefore the control of emission and other substances of pollution depends on efficient energy production.¹⁸⁹ Promotion of sustainable development is also addressed through Part B of Chapter 9, and section 1 is about development, efficiency and consumption of energy. It is stated that the existing obstacles need to be removed to ensure supply of environmentally sound energy to attain sustainable development. The objective of this section is to decrease the adverse impact on the atmosphere from energy sector through promoting environmentally sound and cost effective energy policies and programmes. Concern is also expressed about the countries whose economies are dependent on the production, export and consumption of fossil fuel.¹⁹⁰ To this end it suggests that the Government along with the UN bodies and where applicable, with non-government or intergovernmental bodies and private sector should find out economically viable and environmentally sound energy sources to carry out sustainable development, especially in developing countries. Along with the environment impact assessment, the integrated policy adoption for energy, economy and environmental aspect is also encouraged. Emphasis is given to use of environmentally sound technology, transfer of technology, regional and sub-regional coordination of energy plan, improvement of planning and

¹⁸⁶ Agenda 21, United Nations Conference on the Environment and Development ch. 6 para. 39 (1992).

¹⁸⁷ Ibid., ch. 6 para. 40 h(i) and ch.7para. 5(e).

¹⁸⁸ Ibid., ch. 7 para.46.

¹⁸⁹ Agenda 21, ch. 9 para.9.

¹⁹⁰ Ibid, ch.9para. 10-11.

management capacities as well as the institutional and scientific research in this sector.¹⁹¹ Energy also is recognised as an ingredient of human resources development.

Paragraph 10 of Chapter 35 states about sustainable development and the environmental change, along with the increasing per capita and total consumption of energy, water and non-renewable resources and their shortage in different parts of the world. Concern has been expressed that environment protection is an inalienable part of sustainable development but the environment is under threat because of increasing use of chemicals, energy and non-renewable resources.¹⁹² Actually, Chapter 16 deals with the protection of the environment. One of its objectives is to adopt production process to ensure the optimal use of natural resources by recovering energy reducing waste generation and recycling biomass to halt the degradation of the environment. This agenda also suggests coordinating the statistics and existing data relevant to development and environmental issues for long-term scientific assessment such as depletion of resources, use of energy etc.¹⁹³ The natural resources like soil, minerals, water and biota are included in land resources and these ingredients are organised in ecosystems that provide a number of services required to the maintenance of the integrity of life-support systems and the productive capacity of the environment.¹⁹⁴ It is stated that “Governments at the appropriate level, with the support of the relevant international and regional organisations working on the issue of desertification and drought, should undertake and update existing inventories of natural resources, such as energy, water, soil, minerals, plant and animal access to food, as well as other resources”.¹⁹⁵ It is also stated in Chapter 16 of this Agenda that, the Government with the cooperation of proper international, regional, private sector and non-government organisations, along with academic and scientific organisations, should “Promote new biotechnologies for tapping mineral resources in an environmentally sustainable manner” and “Develop processes to recover energy”.¹⁹⁶ All these issues are related with the sustainable development of energy, non-renewable and mineral resources as well as ensuring the environmental friendly energy for the world. However, the issue of sustainable energy is not incorporated in a comprehensive manner through this Agenda by a separate chapter.

¹⁹¹ Ibid., ch. 9 para.12.

¹⁹² Ibid., ch. 16 para.20.

¹⁹³ Agenda 21, ch. 35 para.17A.

¹⁹⁴ Ibid., ch. 10 para.1.

¹⁹⁵ Agenda 21, ch. 12 para.12(a).

¹⁹⁶ Ibid. ch.16 para. 23(m)

Another outcome of the UNCED was the Commission on Sustainable Development (CSD). While there is no provision of sustainable energy in the Stockholm declaration, in Rio declaration, and the Agenda 21; the CSD 9, held in spring 2000, aimed at focusing on sustainable energy. Although the CSD was well informed about the sustainability of energy, it did not address the climate change result due to burning of fossil fuel. In fact it was a policy document towards the road of sustainable energy.¹⁹⁷ It was concluded with the consensus that CSD 15 of 2007 will be organised with the mandate of implementing agenda of CSD 9. The CSD 15 was held in New York from April 30 to May 11, 2007 with an aim to address the issues involving sustainable energy and climate change, but due to the disagreement among the decision makers it was concluded without any output. This is why energy is called the unwanted stepchild in the conception of sustainable development.¹⁹⁸

In spite the energy sector being ignored in the Rio Conference, a consensus was reached between developed and developing countries regarding the norms and standard of international environmental law. Finally, the Rio conference is considered as a milestone, which set a new agenda for sustainable development. Though the agenda 21 provides consensus blueprint of the sustainable development, ultimately it depends on the goodwill of the host countries, as it is a soft law instrument.¹⁹⁹

2.3.4 The Johannesburg Summit 2002

With a view to strengthening the commitment of the world community towards the sustainable development and reviewing the process, in 2002 the World Summit on Sustainable Development was convened in Johannesburg after 30 years of the Stockholm Declaration. During the period of Rio to Johannesburg, a number of conferences were held with patronisation of the United Nations such as International Conference on Financing for Development as well as the Doha Ministerial Conference.²⁰⁰ The aim of these conferences was to meet the situations where the Governments were not implementing the plan of the UNCED and outcome of other conferences.²⁰¹ In assessing the implementing status of the Agenda 21 Hens and Nath find out a number of deficiencies comprising the fragmented approach of the sustainable development, unsatisfactory progress in attaining sustainable

¹⁹⁷David Hodas, "International Law and Sustainable Energy: A Portrait of Failure, Environmental Law and Sustainability after Rio," *Widner Law School Legal Studies Research Paper* no. 10-21 (2010). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1648906 accessed on April 17, 2019.

¹⁹⁸Ibid.

¹⁹⁹Weaver, "Sustainable Development in the Petroleum Sector," 12

²⁰⁰United Nations, *Johannesburg Declaration on Sustainable Development* (United Nations Publication, 2002). <https://digitallibrary.un.org/record/478154?ln=en> accessed on February 12, 2018.

²⁰¹Umberto Pisano, Andreas Endl and Gerald Berger, *The Rio+20 Conference 2012: Objectives, Processes and Outcomes* (European Sustainable Development Network, 2012), 16.

production and consumption pattern, paying lower attention to the central issues, adaptation of coherence policies on finance, investment, trade, technology and sustainable development.²⁰² However Johannesburg Summit focused to “increase access to such basic requirements as clean water, sanitation, adequate shelter, energy, health care, food security and the protection of biodiversity”.²⁰³ The major outcomes of the conference were, firstly, a political declaration reaffirming the commitment of Stockholm to Rio; secondly, the Johannesburg Plan of Implementation to guide the Governments’ activities and ensure their agreement and commitment towards sustainable production and consumption; and thirdly, affirmation and establishment of numerous partnership initiatives with a view to permitting the civil society to make contribution in area of sustainable development.²⁰⁴ In part of implementation plan, the conference included provision to ensure clean, affordable, economically viable, socially acceptable and environmentally friendly energy. To this end, international cooperation and national support were also emphasised upon to ensure the facility for all, especially for poor population.²⁰⁵ Though petroleum resources were not directly addressed by the conference but provisions concerning sustainable mining of mineral resources were mentioned in Chapter 2 of the second resolution, where provision of rehabilitation was included. Despite the presence of strategic approaches on how to deliver the Johannesburg Plan of Implementation, the Declaration failed to produce a specific mandate to contribute to the development of international environmental law. Even there is no further elaboration of general principles of non-binding nature to guide the conduct of states with respect to sustainable development.²⁰⁶

2.4 CONCEPTUAL BASIS OF SUSTAINABLE DEVELOPMENT

There was a shift in the political debate, from the primary emphasis on environmental issues at the 1972 Stockholm Conference to a collective focus on environmental, social and economic development at the Rio de Janeiro Earth Summit in 1992. Then the priority was on eradication of poverty at the Millennium Summit in 2000 and at the Johannesburg World Summit in 2002. At present Sustainable development is a multidimensional concept aimed at environmental protection along with sustainable consumption of natural resources, health care for people, social equality, economic development, quality of life and eradication of

²⁰² L. Hens and B. Nath, “The Johannesburg Conference,” in *The World Summit on Sustainable Development* eds. L. Hens and B. Nath (Dordrecht: Springer, 2005), 1-33.

²⁰³ Johannesburg Declaration, para 18.

²⁰⁴ Pisano, Endl and Berger, *The Rio+20 Conference 2012*, 16.

²⁰⁵ Johannesburg Declaration, ch.2.

²⁰⁶ Hens and Nath, “The Johannesburg Conference,” 1-33.

poverty.²⁰⁷ This is why for human development the protection of environment becomes the issue of more specific priority to improve the well-being at present and in future.²⁰⁸ However, the researchers, critics and academics from around the world have participated in various extensive discussions and use the sustainable development concept.²⁰⁹ Therefore, the recognition regarding the three essential aspects of sustainable development grew considerably.²¹⁰ The United Nations has adopted a standard definition of sustainable development comprising a ‘three pillar approach’ relying on the convergence of economic development, social equity and environmental protection.²¹¹ However, most significant objective of the social equity is to prevent the depletion of resources for the future generation. It also ensures the stable resource base, avoiding over-exploitation of renewable resource and depleting non-renewable resources only to some extent. Hence, to achieve those three objectives of the sustainable development another significant element is good governance. Good governance is also termed as a fourth pillar of sustainable development as there is close connection among the economy, society, environment and the Government. Moreover, the responsibility to carry out the objectives lies on the Government.²¹²

This study is focussed on the importance of the environmental basis of sustainable development with respect to the extraction of natural gas. Therefore, the discussion is directed towards environmental sustainability. The contention will be to assess how these guidelines can be implemented in case of Bangladesh to sustainably develop its natural gas resources.

²⁰⁷Ana-Maria Teodorescu, “Links between the Pillars of Sustainable Development,” *Annals of University of Craiova* 1(2012):168-173 http://feaa.ucv.ro/annals/v1_2012/EIB-12.pdf Accessed 3 May 2018.

²⁰⁸Paul “A History,” 576-580.

²⁰⁹ Jonathan M. Harris, “Sustainability and Sustainable Development,” *Internet Encyclopaedia of Ecological Economics* (International Society for Ecological Economics, February 2003). <http://www.isecoeco.org/pdf/susdev.pdf> accessed May 19, 2018.

²¹⁰Mohan Munashinghe, “Sustainomics: A Trans-disciplinary Framework for Making Development More Sustainable,” (Munashinghe Institute for Development, 2000). <http://www.mindlanka.org/pdf/mm-paper-1.pdf> accessed on May 4, 2018.

²¹¹The economic aspect refers to the individual welfare through cost effective use of all assets comprising the environmental and social expenditure to manage the sectorial imbalance. Social equity contains the provisions of equal distribution and opportunity, and adequate social service like health and education, gender equity, political accountability, public participation etc. Therefore, the environmental protection requires proper management of waste, maintenance of biodiversity, stability of atmospheric and other ecosystem functions within environmental boundaries. John Drexhage and Deborah Murphy, “Sustainable Development: From Brundtland to Rio 2012,” Background Paper Prepared for Consideration by the High Level Panel on Global Sustainability at its First Meeting, 19 September 2010, UN Headquarters, New York.

²¹²Anis and Siddiqui, “Issues Impacting Sustainability,” 115-124.

2.5 SUSTAINABLE DEVELOPMENT LAW

The concept of sustainable development has improved over time and has assumed a number of different dimensions today.²¹³ The term achieved a wide scale of popularity throughout the world but there is a continuous debate among the legal scholars regarding the normative status and the implementation problem.²¹⁴ A number of controversies are found in the literature. Some legal professionals think that sustainable development is not a principle of customary international law, whereas some others considers it as a principle of law with normative status. In this respect a number of scholars are of the opinion that to have a normative status the concept of sustainable development is too vague and ambiguous in meaning.²¹⁵ Again, many scholars deem that the question about the legal status of concept of sustainable development is immaterial as it has already obtained a place in the international law lexicon and now the matter of concern is the way to apply it in specific practical situations.²¹⁶ In this regard Mauerhofer added that law is considered as an essential prerequisite to face the solutions towards sustainable development.²¹⁷ The recognition of the term sustainable development as international law has been gained through UNCED. In this regard principle 27 of the Rio declaration which states that “States and people shall cooperate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development”.²¹⁸ The same is also confirmed through Chapter 39 of Agenda 21. Therefore, Sustainable development is the convergence of social, economic and environmental law since the social, environmental and economic obligations can overlap. Sustainable development law comprises the major part of the international environmental law. As a result, a reasonable threat exists as to the loss of autonomy of international environmental law as a separate branch of international law. In this regard Lowe mentioned: “not all aspects of the law relating to sustainable development are necessarily relevant to the

²¹³Larry Rockwood, Ronald Stewart and Thomas Dietz, *Foundations of Environmental Sustainability* (New York: Oxford University Press, 2008),176.

²¹⁴ Vaughan Lowe, *Sustainable Development and Unsustainable Arguments*, in *International Law and Sustainable Development: Past Achievements and Future Challenges* eds. Alan Boyle and David Freestone (Oxford: Oxford University Press, 2012), 24.

²¹⁵ A.B.M. Marong, “From Rio to Johannesburg: Reflections on the Role of International Legal Norms in Sustainable Development,” *Georgetown International Environmental Law Review* 16, no.1 (2003): 21-76.

²¹⁶ *Ibid*, 57.

²¹⁷ Volker Mauerhofer (ed.), *Legal Aspects of Sustainable Development: Horizontal and Sectorial Policy Issues*, (Springer International Publishing, 2016), 2.

²¹⁸Rio Declaration, Principle 27.

protection of the environment, nor do all aspects of international environmental law concern sustainable development.”²¹⁹

However, the main focus of this thesis is not to analyse the legal aspects of sustainable development. Rather emphasis will be given on how the sustainable development concept is integrated in exploiting natural gas in Bangladesh. Therefore, the relevant international principles are described briefly to support the analysis which will be presented in the following chapters.

2.6 PRINCIPLES OF INTERNATIONAL LAW OF SUSTAINABLE DEVELOPMENT

Some considerable difficulties emerged to implement sustainable development due to the inherent nature of the concept. Consequently, there was an urge from different corners to develop some principles of sustainable development. The significance of the principle is to provide some guidelines with a view to outline, interpret and implement the national and international legislation and determine the future direction for societies.²²⁰ Therefore, the principle plays an important role to implement the sustainable development with the integration of economic, social and environmental law. In order to meet the demand, in 2002 at the meeting held in New Delhi seven principles of international law of sustainable development were formulated. These principles are identified by International Law Association (ILA) Committee on Legal Aspect.²²¹ Though the principles are derived from the soft law instrument like the Declaration, these possess some persuasive force and are able to create some rights and obligations for the states through its normative character.²²² In fact, the seeds of these principles were planted in the Stockholm Declaration, Rio Declaration and Brundtland Report but the principles have come to light in an organised form through New Delhi Declaration. The principles are:

2.6.1 Sustainable Use of Natural Resources

The ILA declaration clearly states about the sustainable use of natural resources and reaffirm the principle 21 of Stockholm Declaration and principle 2 of the Rio Declaration, the sovereign right of state to exploit the natural resources according to the own environmental

²¹⁹ Lowe, “Sustainable Development and Unsustainable Arguments,” 24

²²⁰ Johanna Velasquez Serna, “Operationalization of Sustainable Development in the International Legal Instruments,” (LLM Thesis, University of Iceland, 2015): 20.

²²¹ Michelle Barnard, “The Role of International Sustainable Development Law Principles in Enabling Effective Renewable Energy Policy – A South African Perspective” *Potchefstroom Electronic Law Journal* 15 no. 2: 207-43. Available at <http://www.saflii.org/za/journals/PER/2012/21.pdf> accessed on March 10, 2018.

²²² Duncan French, *International Law and Policy of Sustainable Development* (Manchester University Press, 2005), 97 cited in Barnard, “The Role of International Sustainable Development Law Principles,” 207-43.

and development policy without any harm to the environment and the areas beyond the jurisdiction.²²³ The obligation to determine the rate of use of natural resources with due consideration of the future generation by ILA declaration was imposed on the states.²²⁴ These principles collectively ensure the responsibility of the state to manage its natural resources in a rational, sustainable and safe way to ensure due diligence for environment protection along with benefit of the present and future generation.²²⁵ In addition the ILA declaration also imposes the responsibility on the state, corporations and other components of the civil society to prevent wasteful use of natural resources and to improve the policy to address the waste minimisation.²²⁶ It also made provision to avoid the unnecessary harm to the environment to ensure a sustainable benefit from the environment. Finally it can be concluded that the principle 1 of the ILA declaration comprises both right and duties of states.

2.6.2 Principle of Equity: Inter-generational and Intra-generational

Equity and poverty eradication is the 2nd principle of ILA Declaration and is considered as the key principles of international sustainable development law.²²⁷ The present generation hold the world as a trustee for the future generation, so it is their responsibility to hand it over to the next generation not in a worse condition than it was received from their ancestors. According to the principle of equity, the resources of the earth belong to all generations. Equity, comprising both inter-generational equity and intra-generational equity, is a significant principle to attain sustainable development.²²⁸ The intergenerational equity means that the present generation use the resources without its depletion so as to meet the demand of the future generation. While the intra-generational equity denotes the proper distribution of the resources among the present generation.²²⁹ This principle is very much related to the sustainable use of natural resources, with a mandate of the present generation to use and enjoy the resources under an obligation of long-term impact and to sustain the resource base

²²³ Principle 21 of the Stockholm Declaration provides for States to have the right to exploit their own resources pursuant to their own environmental policies. Principle 2 of the Rio Declaration goes a step further by placing the exercise of resource sovereignty not only in an environmental but also a developmental context

²²⁴ International Law Association, "New Delhi Declaration of Principles of International Law Relating to Sustainable Development" (New York: United Nations, 2002), Principle 1.

<http://www.ecolex.org/server2neu.php/libcat/docs/LI/MON-070850.pdf> accessed on March 23, 2018.

²²⁵ Nicolaas Jan Schrijver, *Sovereignty Over Natural Resources: Balancing Rights and Duties* (Cambridge University Press, 1997), 8 – 9 Available

at <https://www.rug.nl/research/portal/files/3265518/dissertatie.pdf> accessed on May 12, 2018.

²²⁶ New Delhi Declaration, Principle 1.

²²⁷ Barnard, "The Role of International Sustainable Development Law Principles," 207-43.

²²⁸ Barnard, "The Role of International Sustainable Development Law Principles," 207-43.

²²⁹ Marie-Claire Cordonier Segger, "Significant Developments in Sustainable Development Law and Governance: A Proposal," *Natural Resources Forum* 28 (2004): 61–74.

with due consideration of future generations.²³⁰ Principle 2 of ILA Declaration, which is supported by principle 1 of Stockholm Declaration and principle 4 of the Rio Declaration, emphasises that the right to development will be carried out with proper attention to the future generation. However, the commitment to equity is also found in various treaties relating to the sustainable development, such as the 1992 Convention on Biological Diversity, the 1998 Kyoto Protocol, and the 1992 Framework Convention on Climate Change.²³¹

2.6.3 Common but Differentiated Responsibilities

Common but differentiated responsibility is the 3rd principle of the ILA Declaration though it has already been incorporated in principle 7 of the Rio Declaration. The principle mainly comprises of two parts, one is common responsibility and the other is differentiated responsibility. Here the former refers to the responsibility of the world to ensure the sustainable development while the latter means that the responsibility will vary to developed and developing country according to their socio-economic condition. This provision is recognised by a number of scholars as one of the key requirements to attain sustainable development.²³² The New Delhi Declaration acknowledges the roles played by developed States regarding global environmental concern, and encourages them to offer help with their financial and technological capacity to developing states to face the concerning issues.²³³ Greater responsibility was imposed on the Developed nations according to the resources they acquire and create pressure on the environment²³⁴ to minimise the unsustainable pattern of production and consumption.²³⁵ The New Delhi declaration also makes provisions for cooperation of international organisation, multinational corporation, NGOs and the civil society to make contribution in attaining the common goal.²³⁶ Kyoto Protocol is the best example of the common but differentiated responsibility although it is not successful yet.

²³⁰ New Delhi Declaration, Principle 2

²³¹ Segger, "Significant Developments in Sustainable Development Law," 61–74.

²³² Segger, "Significant Developments in Sustainable Development Law," 66.

²³³ The Centre for International Sustainable Development Law (CISDL), "Sustainable Developments in Recent WTO Law and 'Jurisprudence,'" *Fifth Session of The Ministerial Conference of the World Trade Organisation* Cancun, Sept. 10-14, 2003. www.cisd.org/pdf/brief_common.pdf accessed April 7, 2018.

²³⁴ Rachel Emas, "The Concept of Sustainable Development: Definition and Defining Principles," Global Sustainable Development Report 2015.

https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015_SD_concept_definiton_rev.pdf accessed on January 12, 2018.

²³⁵ New Delhi Declaration, Principle 3.

²³⁶ Ibid.

2.6.4 The Precautionary Approach to Human Health, Natural Resources and Ecosystems

The 4th principle of the New Delhi Declaration is the precautionary principle which is built on principle 15 of the Rio Declaration. It states “In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.”²³⁷ In UNCED, the term precautionary approach is used instead of precautionary principle. This principle implies that if the consequence of the development activities may result in serious environmental harm then it should not be carried out, even if the probable damage may be uncertain. There are two parts of the principle, one is the lack of scientific certainty and the other is the probable irreversible harm. As a result, the principle entails the application of some measures which are followed by most of the countries and organisations of the world, such as Best Available Technologies (BATs), Best Environmental Practices (BETs) and at last the Environmental Impact Assessment (EIA).²³⁸

This principle is very significant as whether a particular project will be approved or not depends on this principle considering its positive and negative impact on the environment, though the possible consequences are not completely certain.²³⁹ Though the principle is an influential one in the decision making process, yet its legal status is not recognised; rather it is merely treated as the norm of customary international law. However most of developing countries of the world apply the EIA as a mean to ascertain the precautionary principle.

2.6.5 The Principle of Public participation and Access to Information and Justice

Principle 5 of the New Delhi Declarations recognises the public participation in decision making process to ensure sustainable development and good governance.²⁴⁰ People should have right to express their opinion where the decision impacts their lives and well-being.²⁴¹ This principle is included in various international legal instruments and is based on

²³⁷Rio Declaration, Principle 15.

²³⁸ United Nations Environmental Programme (UNEP), Fifth Global Environmental Outlook (GEO-5) *Environment for the Future We Want*. Available at <http://wedocs.unep.org/handle/20.500.11822/8021> Accessed 4 May 2018.

²³⁹ Jonas Ebbesson, *Compatibility of International and National Environmental Law* (IustusFörlag 1996), 246-254.

²⁴⁰New Delhi Declaration, Principle 5.

²⁴¹Segger, “Significant Developments in Sustainable Development Law,” 61–74.

fundamental human right of freedom of expression.²⁴² The principle also emphasises on the access to exact and comprehensive information and timely access so that concerned people can participate in decision making process. This principle is very important to ensure sustainable development as it is capable of making a connection between the people and the institution. Moreover the principle also recognises the right of individual to access to justice in case the decision adversely affect their life.²⁴³

2.6.6 Principle of Good Governance

There is very close connection between the public participation and good governance as public participation is the precondition of good governance.²⁴⁴ Public participation serves as a vehicle of transparency which is one of the fundamental elements of good governance. The five key elements of good governance are identified by the United Nations High Commissioner for Human Rights (UNHCHR). These are transparency, responsibility, accountability, participation and responsiveness by the State to the needs of the people.²⁴⁵ Good governance is the 6th principle of the New Delhi declaration which imposes responsibility on the states, international organisations and the non-state actors to ensure a democratic government with accountability, which will respect the Rio declaration and ensure participation of women.²⁴⁶ The requirement of Good governance to ensure sustainable development at all levels including local to global is also recognised by the Johannesburg Plan of Implementation.²⁴⁷ Therefore, good governance also requires responsibility of corporations and investors to make a balanced distribution of wealth among the communities.²⁴⁸ However, it can be concluded that Good governance acts as a mediator to serve the best interest of the community and to find out suitable policies and procedures to the end of sustainability.

2.6.7 The Principle of Integration and Interrelationship in Relation to Human Rights and Social, Economic and Environmental Objectives

The principle of integration is a very much legalistic and logical approach as it makes integration among the international economic law, international social law and international environmental law, because without the coordination of these three pillars it is not possible to

²⁴² Barnard, "The Role of International Sustainable Development Law Principles," 207-43.

²⁴³ New Delhi Declaration, Principle 5.

²⁴⁴ Johannesburg Declaration, para. 4, 45(f), 62 and 71.

²⁴⁵ Commission on Human Rights, "The Role of Good Governance in the Promotion of Human Rights," Commission on Human Rights Resolution 2001/72 (2001)
http://ap.ohchr.org/documents/E/CHR/resolutions/E-CN_4-RES-2001-72.doc accessed on 21 April 2018.

²⁴⁶ New Delhi Declaration, Principle 6.

²⁴⁷ Johannesburg Declaration, para. 4, 45(f), 62 and 71.

²⁴⁸ New Delhi Declaration, Principle 6.

ensure sustainable development²⁴⁹ at any level including local, national, sub-national, regional and global. Though it was comprised in the 7th principle of the ILA Declaration, much before the ILA Declaration it was recognised through principle 13 of the Stockholm Declaration and principle 4 of the Rio Declaration.²⁵⁰ The integration of social, economic and environmental concerns are considered a common ground to move on and implement the principles of sustainable development. Therefore, to achieve sustainable development the principle of integration and interrelation is considered one of the fundamental requirements.²⁵¹ Although the principle of integration provides very practical approach of sustainable development, compared to other principles of the New Delhi Declaration, the principle is of most amorphous nature that has not been yet popularly incorporated in various legal instruments.

The New Delhi declaration contains these seven principles, yet another important principle emerged from the Rio declaration which is popularly known as the polluter pays principle.

2.6.8 Polluter Pays Principle

Polluter pays principle is not included in New Delhi declaration. This principle was first incorporated in the economic aspect of environmental policies adopted in the recommendation of the Organisation of the Petroleum Exporting Countries (OECD) in 1970s.²⁵² It was first introduced by principle 22 of Stockholm Declaration and it is recognised as a significant mean to ensure sustainable development by Principle 16 of the Rio Declaration which clearly states that “National authorities should endeavour to promote the internalisation of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.”²⁵³ It is an economic rule for internalization of the cost of externality resulted from pollution.²⁵⁴ Community should not bear the cost of pollution and liability must be imposed on the polluter. This principle is governed by civil liability,²⁵⁵ as a result the polluter has to pay the

²⁴⁹Segger and Khalfan, *Sustainable Development Law*, 102.

²⁵⁰ Stockholm Declaration, Principle 4.

²⁵¹SebastienJodoin A *The Principle of Integration and the Interrelationship in Relation to Human Rights and Social, Economic and Environmental Objectives* Centre for International Sustainable Development Law (Oxford: 2005), 1.

²⁵² Patricia Brine and Alan Boyle, *International Law and Environment*, 2ndeds, (Oxford: Oxford University Press, 2002), 92 in Faruque, *Environmental Law: Global and Bangladesh Context*, 54.

²⁵³ Rio Declaration, Principle 16.

²⁵⁴Faruque, *Environmental Law: Global and Bangladesh Context*, 54.

²⁵⁵Ibid

cost of environmental damages. At present it has become a very popular instrument to minimise the cost of the authority and community, because earlier burden had to be borne by the authority and community where polluters availed the privilege to escape from their liability. However the environmental impact assessment as the precautionary approach is a significant principle of the sustainable development but every probable impact may not be ascertained due to lack of technology or other reasonable grounds. In those situations the polluter pays principle plays very significant role to clean up the pollutant and the protection of environment though the complexity may arise to identify the polluter.

The number of principles discussed above are divided into two groups, one is the substantive principles and the other is the procedural ones. The environment impact assessment, which is the moderate form of the precautionary principle, access to information and public participation, and good governance are considered the procedural principles and rest of the principles are considered as substantive ones.²⁵⁶

In order to ascertain the extent to which Bangladesh integrates sustainable development concept in its policy and laws related to natural gas operation, the following methodology will be applied. The background of the historical development of the natural gas of Bangladesh will be discussed first, and existing laws and policies in Bangladesh will be analysed afterwards with specific reference to the principles contained therein. These principles will then be categorised in light of the principles contained in the *New Delhi Declaration* in order to reach a conclusion on whether or not the legal framework and institutions of Bangladesh facilitate sustainable development of natural gas.

2.7 THE RELATION OF NATURAL GAS EXTRACTION AND SUSTAINABLE DEVELOPMENT

In the modern world, natural gas plays a vital role in the energy structure and makes a greater contribution to energy conservation and emission reduction. Natural gas is such a kind of petroleum resource of low carbon, high efficiency and clean energy that it optimises the energy structure and thus is very crucial for national economic development.²⁵⁷ Extraction of natural gas by its very nature is environmentally intrusive. Not only gas extraction, but every mining activity causes environmental degradation to some extent which includes deformation of ground surface, water pollution, gas flaring and dust, impoverishment of soil, noise and

²⁵⁶Faruque, *Environmental Law: Global and Bangladesh Context*, 72.

²⁵⁷Yi Su and Kedong Luo, "Study on the Sustainable Development of Natural Gas Resources in China," *Journal of Clean Energy Technologies*, 3, no. 6(November 2015):448.

vibration.²⁵⁸ Therefore, a number of socio-economic consequences are also related with the exploration activities which are the infrastructural development of the concerned area, health and safety problem, interest of the local community and their rehabilitation, and the management of the gas field etc. So during the production and exploration stage all of these should be dealt with due consideration. To satisfy the diverse demands of the people, the aim of the contemporary mining activities is to maximise the production without paying attention to its long term effects. This situation continues yet after the completion of the extraction because it is found that as soon as the production of a mine is stopped, its environmental and social disruptions are left to the local communities and the future generation.²⁵⁹ It is realised by mineral industry that the output of these activities improves and updates the standard of living, so the operation must be done in a manner not to harm the environment or the planet itself, rather to care for it to ensure the benefit of the coming generation.²⁶⁰ However there are general perceptions among the people that the petroleum industry does not manage risk adequately, operate transparently or create benefits for society.²⁶¹

This calls for a balance between the petroleum exploration and the damage done to physical, ecological and human environment along with due consideration of international standard of health. It is only possible through sustainable petroleum operation. Moreover, increasing consciousness for three pillars of sustainable development (economic, social and environment) along with the technological development reveals that if the mining operation is managed properly, it can play a vital role in creating lasting benefits for local communities and the large population.²⁶²

The concept of sustainable development is used in numerous aspects of human life and development. It implies that like all development efforts, petroleum extraction also should be done in a wise and optimal manner. In case of petroleum industry, sustainable development demands that the industry contributes the maximum benefit to the society

²⁵⁸ Jozef Dubinski, "Sustainable Development of Mining Mineral Resources," *Journal of Sustainable Mining*, 12, no. 1 (2013):1–6.

²⁵⁹ Elizabeth Bastida, *Managing Sustainable Development in Competitive Legal Frameworks for Mining: Argentina, Chile and Peru Experiences*.

<http://www.dundee.ac.uk/cepmlp/gateway/index.php?news=28258> accessed on December 3, 2018.

²⁶⁰ Society for Mining, Metallurgy and Exploration, *The Mining Industry and Sustainable Development*, (2016). https://www.eenews.net/assets/2016/06/29/document_pm_01.pdf accessed on November 8, 2018.

²⁶¹ Deborah J. Shields, "Applying Sustainable Development Principles and Sustainable Operating Practices in Shale Oil and Gas Production," *The Open Petroleum Engineering Journal*, 9 (2016): 137-149.

²⁶² Felix Remy and Gary MacMahon *Large Mines and Local Communities: Forging Partnerships, Building Sustainability* World Bank Group's Mining Department, 2002 Available at <http://siteresources.worldbank.org/INTOGMC/Resources/largemineslocalcommunities.pdf> accessed on July 3, 2018.

minimising its negative effect and the benefit must be long lasting with due consideration of economic, social, and environmental aspect.²⁶³ At a glance it may seem that the concept of sustainability is not compatible with non-renewable or petroleum resources because once it is extracted it is permanently lost and cannot be reproduced, so sustainability is not possible. However, a close scrutiny of the issue reveals a different aspect. Exploitation of petroleum resources contribute to the rapid economic growth of a country, but after depletion, which is inevitable, the state has to face a negative economic growth; because it is not possible to continue to the development process as earlier. This development is not sustainable. In this aspect sustainability refers to maximum recovery with minimising its adverse effects. Thus, the first guiding principle of sustainable development is that it must be reasonable in economical acquisition and rate of use of mineral resources.²⁶⁴

The world's first well of petroleum was drilled in China in the fourth century through bamboo poles. Thereafter, petroleum is found in European and Asian countries. The modern petroleum industry started its journey in 19th century by drilling a well of only 69 feet deep in Titusville, Pennsylvania of USA at the end of the ninetieth century.²⁶⁵ At the beginning, the primary consideration was economic benefit. In that period, other consequences of petroleum operation were ignored and the environment was matter of no consideration. Recent researches reveal that the nuclear weapons physicist Edward Teller had, by 1959, first made the American Petroleum Institute (API) aware about the emission of carbon dioxide and its impact on the environment as consequence of the petroleum activities.²⁶⁶ The Stanford Research Institute submitted a report in 1968 to API warning about the harmful effects of burning fossil fuel for the planet.²⁶⁷ However, the institute was silent about it. Thereafter, growing awareness about climate change and environmental degradation bound the

²⁶³Sergei Vinogradov, Environmental Protection in the Petroleum Industry, *Encyclopaedia of Hydrocarbons* 4: 507-523.

²⁶⁴Jozef Dubiński, Turek M., Wachowicz J., "Hard Coal Mining and the Idea of Sustainable Development," In *Proceedings of International Scientific Conference – School Underground Exploitation*, Dniepropietrowsk, (2007):27–38. Cited in Józef Dubiński, "Sustainable Development of Mining Mineral Resources," *Journal of Sustainable Mining* 12, no. 1 (2013):1–6.

²⁶⁵OPEC, *I need to know: An Introduction to the Oil Industry and OPEC*, OPEC Secretariat, Public Relations & Information Department Austria 2013.
https://www.opec.org/opec_web/static_files_project/media/downloads/publications/ChildrenBook2013.pdf accessed November 5, 2018.

²⁶⁶Benjamin Franta, "On its 100th birthday in 1959, Edward Teller Warned the Oil Industry about Global Warming," *The Guardian*, Mon 1 Jan 2018, available at <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2018/jan/01/on-its-hundredth-birthday-in-1959-edward-teller-warned-the-oil-industry-about-global-warming> accessed on November 11, 2019.

²⁶⁷Oliver Milan, "Oil Industry Knew of 'Serious' Climate Concerns More than 45 Years Ago," *The Guardian* April 13, 2016, available at <https://www.theguardian.com/business/2016/apr/13/climate-change-oil-industry-environment-warning-1968> accessed November 11, 2019.

petroleum producing countries to comply with some standards while conducting petroleum operations. After that a number of international initiatives were taken to address the environmental impact on the development activities including petroleum operation. The result of which are UNCHE 1972, popularly known as Stockholm Declaration; UNCED 1992, known as Earth Summit; the Johannesburg Summit in 2002. A number of conferences were held following these conventions and declarations. The petroleum activities have both positive and negative impacts on human civilisation. On one side it develops the world economy enormously, allowing people to live a high standard of life; on the other hand, the degradation of environment as a result is evident.²⁶⁸ The environmental aspect of petroleum operation was neglected for a long time, especially in the developing countries.²⁶⁹ The triple bottom line approach of sustainable development of petroleum operation was not in implementation, rather the economic pillar was considered more important and environment was neglected as the externalities of the operation.²⁷⁰

Realising the significances of the negative impacts of petroleum operation on environment, the global community paid attention to some extent to reconcile the conflict between development of petroleum resources and environment by the end of the 1980s.²⁷¹ At present, environmental aspect is the global issue and part of social life and economic development.²⁷² Though the negative impact of the petroleum operation on the environment is recognised throughout the world, there is no comprehensive global convention addressing these impacts.²⁷³ There are some regional or multilateral agreements, though their implementations are completely dependent on the discretion of the petroleum producing countries.²⁷⁴ Research report suggests that the host country must adopt these agreements in their domestic laws to bind the operating petroleum companies to follow those.²⁷⁵

²⁶⁸Zhiguo Gao, "Environmental Regulation of Oil and Gas in the Twentieth Century and Beyond: An Introduction and Overview" in *Environmental Regulation of Oil and Gas*, Zhiguo Gao, Chih-Kuo Kao (eds) (London: Kluwer Law International Ltd., 1998).

²⁶⁹Faruque, "Stability in Petroleum Contracts: Rhetoric and Reality (Lessons from the Experiences of Selected Developing Countries and Economies in Transition (1980-2002))" 204.

²⁷⁰Esther Namuyondo, "Sustainability and Oil Exploration in Uganda – the case of Uganda's Albertine Region," (Master Thesis, Aalborg University, Uganda 2014), 31.

²⁷¹Faruque, "Stability in Petroleum Contracts: Rhetoric and Reality (Lessons from the Experiences of Selected Developing Countries and Economies in Transition (1980-2002))" 204

²⁷²Gao, "Environmental Regulation of Oil and Gas in the Twentieth Century and Beyond: An Introduction and Overview"

²⁷³ Kyla Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector: A Survey of Environmentally Relevant Clauses," *Sustainable Development Law & Policy* 11, no. 3 (2011): 15-20, 39-40.

²⁷⁴Weaver, "Sustainable Development in the Petroleum Sector," 24.

²⁷⁵Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector," 15-20, 39-40.

During the first half of the 20th century, sustainable development in the oil and gas sector referred to the enactment of relevant laws and regulations which were required to prevent the underground waste of oil and gas through a number of mechanisms such as controlling competitive drilling and production.²⁷⁶ But in recent time the sustainable development requires the lasting socio economic benefit and protection from environmental degradation. However, the “Berlin guidelines”²⁷⁷ provides some of the area of consideration for sustainable mineral exploration.

2.7.1 Berlin Guidelines

As there were no specific guidelines for the mining activities whether it was petroleum or other non-renewable resources, a dire need for some guidelines arose regarding these operations. To meet the demand of different parties involved, the first edition of *Environmental Guidelines for Mining Operation* was published in 1994. It was a successful result of 1991 Berlin Round Table on Mining and Environment, organised by the United Nations and the German Foundation for International Development. With social change of economic and environmental dimensions, there was a need to adopt the guidelines in the light of sustainable development. The second edition of 2002 Berlin Guidelines was built on the reflection of these changes and expected development of more formal legislation.²⁷⁸

The Guidelines mainly address five main areas to attain sustainable development in mining which will be applicable to all stages of exploration, operation, decommissioning and closure and rehabilitation. These areas are the followings:

2.7.1.1 Mining and sustainable development

Sustainable development is a very significant way to look at the development process including economic, social, cultural and environmental aspects of human life. Sustainable mining depends on development, operation and closure of mine field environmentally and socially acceptable manner. Contribution of mining is recognised in the economy of any country and it requires to maximise the national, corporate and community benefit, minimising the physical and social environmental impact. To achieve this goal and sustainable development of mineral resources the mining corporations and the Government have to work together.²⁷⁹ Due to negligence of Governments and mining companies about the

²⁷⁶Weaver, “Sustainable Development in the Petroleum Sector,” 51

²⁷⁷ United Nations, “Berlin II Guidelines for Mining and Sustainable Development,” (New York, United Nations, 2002). https://commdev.org/userfiles/files/903_file_Berlin_II_Guidelines.pdf accessed on July 5, 2018.

²⁷⁸Ibid.

²⁷⁹Ibid.

human and social value and demoralisation of the existing social structures and bonds, the mining operation may generate extensive and long-term damage. On the contrary, mining operations developed, operated and closed in an environmentally and socially sound way may contribute to sustainable development.

2.7.1.2 Regulatory frameworks

The responsibility of Government is to provide a well-structured legislative framework including all aspects of sustainable development. A number of laws and regulations may be relevant to physical and social aspects of environment and economic development. The distinctive nature of mining industry leads the Government to enact separate regulatory system compared to other industry, considering the issues as state sovereignty, ownership and control, community impact, environment, sustainability, depletion and site dependency.²⁸⁰ The Berlin guidelines provides the list of number of laws and regulations to make a sustainable mineral extraction. For example, the mining law which determines the rights and obligations of both parties *i.e.* the owner and operating company acts as a key instrument to govern the mining operation. Therefore, the environmental legislation plays a significant role to minimise the negative environmental impact of mineral exploitation. Actually good environmental practice depends on the proper management and implementation of good environmental legislation. It includes the environmental impact assessment, environment management plan, environmental monitoring programme, environmental reporting, environmental audit, socio-economic impact assessment, rehabilitation programme, compensation, mine closure, fees and charges and financial surety. Moreover, a number of laws addressing the land acquisition, forest protection, waste management, water pollution, air quality, hazardous substances management, radioactive substance management and international conventions and implementation instruments are also prescribed for a regulatory framework of sustainable mineral development.

2.7.1.3 Environmental management

Environmental management is such a term which includes all the necessary steps which are essential to ensure the environmentally sound and socially acceptable mining operation. Therefore, the principles of good environmental management²⁸¹ are the followings:

- identifying all potentially significant adverse environmental impacts and social effects that would result without mitigation or control;

²⁸⁰ United Nations, "Berlin II Guidelines."

²⁸¹ Ibid.

- defining control strategies to mitigate all potentially significant adverse impacts;
- implementing procedures to instigate control strategies in response to the unacceptable risk of adverse environmental impact;
- implementing procedures to review control strategies in response to performance evaluation; and
- implementing procedures to promote the benefits of any positive environmental or social impacts.

Moreover, another matter to be taken into account is the community consultation. It is very much helpful to establish the trust of the people in the operation. A good number of environmental instruments are referred to in the regulatory framework section of Berlin Guidelines. Those are practically applicable to ensure sound management of the environment. The tools are environmental impact assessment, socio-economic impact assessment, environment management plan, environmental monitoring programme, environmental reporting, environmental audit, rehabilitation programme, and mine closure.²⁸² Among the various tools the most important one is the Environmental Impact Assessment (EIA), and other tools can be incorporated within this one instrument. The EIA is a process to incorporate the environmental issues in planning and decision making process of any particular project of mining to ensure sustainable development. Actually, it is the process by which the possible impacts on the environment are evaluated and it suggests the requirements to mitigate those impacts. It is a prime step to finalise the decision whether any project will be permitted or not and if permitted then what measures are to be taken by operator to mitigate the adverse impact.²⁸³

Social environmental impact assessment as a part of the EIA gains a considerable attention from all corners because any effect on the physical environment makes some material change in the society.²⁸⁴ The specific area for SEIA are the probable change as a result of replacement and migration; the system of land utilisation and its potential impact; the social and cultural impact; health and nutrition system and the impact of mining on them; the education, services, employment and income levels of the people of relevant area; the influence of the payment of compensation for project-related environmental impacts and social disruption; and lastly the impact of mining to the women and children.²⁸⁵

²⁸² United Nations, "Berlin II Guidelines".

²⁸³ Ibid.

²⁸⁴ Ibid.

²⁸⁵ Ibid.

The Environmental Management Plan (EMP) is the undertakings of the mining industry through documentation on how to mitigate the probable environmental impact. The EMP is a process to adjust with the state environment regulations along with the corporate ones.²⁸⁶

The Environmental Monitoring Programme is a periodic assessment whether the mining industry complies with the environmental and social norms, as mining industry is under an obligation to act under the environmental management plan as a consequence of EIA or SEIA. If it does, then assessment of its accuracy is also necessary.²⁸⁷

An Environmental Audit ensures the environmental and social performance of the operation. Mine closure is an important aspect of the EIA, and during the period of assessment of EIA and SEIA the impacts of mine closure is also measured. The consequences of mine closure affect the society. Closing a mine entails restoration of land, reduction of the risk of pollution and provision for future economy. Therefore mining as a long term process creates some facilities of education, health and sanitation, employment opportunity etc. After its closing the society have to face some challenges. So it should be managed in such a manner so as to ensure the sustainable benefit to the society.²⁸⁸

2.7.1.4 Community consultation and development

Community consultation and participation is a significant way to ensure sustainable development in mining operation. It is very much important for the state and the operating company to ensure at all stages of mining the environmental and social responsibility along with the successful economic development. Community means those communities who are directly or indirectly affected by the mining activities and the local community. Community participation ensures their effective involvement in the decision making process. Consultation refers to the exchange of opinion among the Government, corporation and the local people of the area, because the local people are the most familiar with the site environment. As a result of consultation there establishes a relation of trust as they know best what is going on and how, as well as the positive and negative impacts of the very activities.²⁸⁹

2.7.1.5 Voluntary undertakings

This obligation is solely imposed on the corporations. Mining industry has to frequently adapt with the changing socio-economic situation and public expectation of the site where they

²⁸⁶ United Nations, "Berlin II Guidelines."

²⁸⁷ Ibid.

²⁸⁸ Ibid.

²⁸⁹ Ibid.

operate. One of the significant aspects of the good business practice is the respect for environmental concern. Many of the mining companies have adopted the industry code to comply with environmental requirement at all the steps of operation from exploration to mine closure ensuring economic development. To some extent the corporations do it even going beyond the legal requirement. Moreover, to make the public acquainted with the initiatives taken by the industry, the corporations also publish the corporate environmental report. The aim of the report is to provide a transparent and consistent framework for environmental management, to build up a strong relation with stakeholders and to increase community credibility. Annual environmental reporting is another significant undertaking by the corporations to disclose their initiatives to employees, shareholders and the general public.²⁹⁰

2.7.1.6 Access to information

Access to information is necessary to disseminate the material information concerning the mining project. It is one of the significant parts to ensure sustainability in this sector. It is considered a legal requirement because the monetary organisations often incorporate the term as a requirement for investment.²⁹¹ The International Finance Corporation (IFC) has determined four principles to ensure effective disclosure of information in its Good Practice Manual, “Doing Better Business through Effective Public Consultation and Disclosure”. These are: (i) Early disclosure to make the information available to the public or the local community from the very initial stage. (ii) Using the information disclosure to support consultation so that people of the affected areas are informed of both the positive and negative sides of the concerned operation and the mitigation measures to be adopted. (iii) Providing meaningful information so that the concerned or interested community of the local area will be able to understand the information and get enough time to offer their opinion. (iv) Ensuring the accessibility of information by spreading in a widely circulated media so that the interested group can easily avail the information. In such cases, technology offers a number of alternatives.

Though a number of guidelines are provided by the Berlin guidelines, some of the major areas are overlooked. For example, no emphasis was given to the conservation for future generation. Again, though access to information is one of the significant principles to ensure the sustainable development, in these guidelines it is included in the ‘other issues’ which means it is not treated equally with other guiding principles. Another important issue is

²⁹⁰ United Nations, “Berlin II Guidelines”.

²⁹¹ Ibid.

that the right of access to information is ensured only by the operating company, but responsibility is not imposed on host government. At present many countries of the world have incorporated the right to information as a fundamental right, so the responsibility also lies on the host government to make people aware about what is going on.

2.7.2 Petroleum Governance Initiatives (PGI)

The Berlin guidelines provide a more general guideline for the mineral extraction. As a result, in order to find out a more detailed instruction to extract the petroleum resources the Petroleum Governance Initiatives is very much relevant. The (PGI)²⁹² is the outcome of a survey on 27 oil producing developing countries and it was carried on jointly by World Bank and the Government of Norway.²⁹³ It was aimed at providing guidelines to the petroleum producing developing countries to attain sustainable management of petroleum development, addressing management of resource and revenue, efficient management of environmental, social, and community issues resulting from petroleum development along with promoting long lasting economic and community development. The Government is responsible for ensuring sustainable development of the petroleum resources, accrue for the present and future generation, and protect the environment. PGI comprises three pillars of sustainable petroleum operation. These are transparency and economic responsibility, environmental sustainability, and responsible community development. To conduct the survey, the PGI developed some tools which cover the management of environmental and social aspects of petroleum development based on the principle of good governance in this sector.²⁹⁴ However the major areas of sustainable petroleum governance are discussed below.

2.7.2.1 Legal, regulatory, and contractual framework

Almost every petroleum producing country has some laws and regulations regarding petroleum development whether they ensure sustainable development or not. These laws address the environmental issues like use of water, emissions into air, land and water; effluents treatment plants; waste management, decommissioning and abandonment, pollution and noise. Contractual framework refers to the terms and conditions of petroleum development between the regulator and the oil producing company. The rights and obligation of both parties are determined by the contract.²⁹⁵

²⁹²Eleodoro Mayorga Alba, *Environmental Governance in Oil-Producing Developing Countries: Findings from a Survey of 32 Countries*, (Washington D.C.: The World Bank, 2010),1. <https://openknowledge.worldbank.org/handle/10986/18285> accessed on November 13, 2019.

²⁹³Ibid., 1.

²⁹⁴Ibid., 7.

²⁹⁵Alba, *Environmental Governance in Oil-Producing Developing Countries*, 8-9.

2.7.2.2 Institutional strengthening for good governance

Institutional capacity building is very important to ensure the effective implementation of the regulatory framework. The institutional capacity should be comprised of the efficient environmental authority with clear and written environmental objectives, financial autonomy and other capabilities to ensure the good petroleum governance.²⁹⁶

2.7.2.3 Public consultation and access to information

Public consultation is very important to ensure community development which is the third pillar of PGI. In most cases consultation refers to informing the people about the petroleum development rather than involving them in the decision making process. Public consultation and access to information are very much interrelated because it is not possible to participate in consultation being in the dark about the subject matter. So the information should be available to the stakeholders, disclosed at an early stage, allocated sufficient time to respond, and must be paid due respect to their opinion.²⁹⁷

2.7.2.4 Environmental assessment process

Environmental assessment generally means to identify the potential impact of a particular operation on the environment. At the exploration, development and production stages of oil and gas operations, environment impact assessment is essential. The data collected for evaluation and the result of the assessment should be made public. However, it should not be a mere formality to approve the petroleum project, rather it should be a prerequisite with a viewing to finding out the mitigation process to minimise the negative environmental and social impact during the entire project life. After measuring the impact of a particular petroleum project on environment, it should be under the regular monitoring and follow up. It evaluates the compliance with the mitigation plan at every stage of the operation. Monitoring report also should be disclosed to the public.²⁹⁸

2.7.2.5 Decommissioning and liability

Decommissioning is one of the significant parts of petroleum operation. Unfortunately when the Government approves any project for petroleum development, it pays very little or no attention to this decommissioning and liability of restoration stage. At the time of environmental impact assessment the decommissioning and abandonment stage should also be taken into consideration, so that the field is not left as orphan well. Timely decommissioning is another significant factor for mine closure. However, the survey reflects

²⁹⁶Alba, *Environmental Governance in Oil-Producing Developing Countries*, 8-910.

²⁹⁷Ibid., 11-14.

²⁹⁸Ibid., 14-16.

that most of the Governments have no policy of timely decommissioning and abandonment process. An established process for managing the decommissioning and abandonment of oil and gas field ensures more sustainability to its environmental and social development. Therefore, provisions should also be made that the owner/operator provides a security in the form of deposit, bond, or other financial instrument for future liability associated with oil and gas activities.²⁹⁹

2.7.2.6 Private sector involvement in good environmental practice

Private sector involvement in good environmental practice is an emerging concept to ensure the environmental and social sustainability in petroleum development, as the petroleum industry has to comply with the international standards concerning the oil and gas development. Government is reluctant to consult with petroleum producing industries for making positive change in the national legislation for best environmental practice. Practice also does not reflect the involvement of private sector to minimise the adverse impact of the oil and gas development. Good environmental practice also includes the provision of emergency responding. In this area private sector can play a very important role. Therefore, the EIA process should also contain the emergency provision and the probable immediate remedy thereof. However, the concept of private sector involvement has not yet achieved popularity among the various petroleum development processes.³⁰⁰

2.7.3 Standard for sustainable mineral development

There is no universally recognised standard for sustainable development. It varies in different sector according to their working condition. In case of mineral development also there is no standard to ensure the sustainable development. Considering the critical situation Caron et al.³⁰¹ tried to find out some indicators to ensure the sustainable mineral development. To find out a widely accepted standard, a survey was made among 44 stakeholders including managers and employees working in mineral extraction companies, sub-contractors, investors, local communities, indigenous communities, environmental NGOs and Government. The survey reflects the following eight principles containing 27 criteria:

1. Environmental quality: Environmental quality comprises of efficient use of natural resources, respect of sensitive areas, air quality, water quality, soil quality and wildlife habitat quality. The environmental quality consists of these indicators of which

²⁹⁹Alba, *Environmental Governance in Oil-Producing Developing Countries*,17-18.

³⁰⁰Ibid., 19-20.

³⁰¹Joanie Caron, Suzanne Durand and Hugo Asselin, "Principles and Criteria of Sustainable Development for the Mineral Exploration Industry," *Journal of Cleaner Production* 119 (2016): 215-222.

efficient natural resource use refer to the waste management process and the use of water. While the respect of sensitive areas deal with the areas which are not protected by law but considered as environmentally or socially sensitive. Air quality, water quality and soil quality refer to prevention of pollution of air, water and soil as these are contaminated from the mining operation such as dust, drilling, radioactive waste etc, which are inevitable to mineral exploration and production. Wild life habitat quality is also significant as their normal lifestyle may change due to unexpected interference like noise, vibrations etc. from the operating company.³⁰²

2. Quality of life: The quality of life consists of the audible environment, visual environment, health and safety, recognition of local communities' concerns, recognition of indigenous communities' concerns and respect of cultural heritage. This principle also comprises of six phenomena: free, prior, and informed consent, the audible referring to noise and vibration, and visual referring to rehabilitation, erosion of vegetation etc. Here the health and safety means the local people's physical concern. Recognition of local and indigenous community refers to their participation and informing them about the running project but cultural heritage overlap in respect of sensitive areas. The participated stakeholders were in high consensus about the indicators.³⁰³

3. Work environment: Work environment indicator includes labour relations, working conditions, equity, occupational health and safety and training. Though there are five indicators for this principle, the stakeholders agreed upon two criteria -- occupational health and safety and training. Training is very relevant as it plays very significant role to create manpower which will be fruitful even after the abandonment of mining to find out a suitable work. Thus social sustainability is ensured. Therefore, as the risk is associated with the mining operation to some extent, so safety and healthy environment are also matters of consideration.³⁰⁴

4. Local investment: This criterion contains the social development, job creation and selection of local suppliers. This principle includes three criteria out of which the responsibility of social development lies on the Government and service opportunity and local supplier involvement lie on the corporation. But some stakeholders pointed out the lack of qualified local suppliers.³⁰⁵

³⁰² Caron, Durand and Asselin, "Principles and Criteria of Sustainable Development," 215-222.

³⁰³ Ibid.

³⁰⁴ Ibid.

³⁰⁵ Ibid.

5. Business ethics: This indicator encloses Corruption prevention, Promotion of sustainable development along with the value chain and Cost internalisation. Corruption plays a crucial role in hindering sustainable development. So the operating companies should develop a code of ethics. Therefore the enhancement of sustainable development through value chain is very important as it imposes responsibility on every concerned personnel involved in operation to ensure sustainability.

6. Innovation: Responsible use of technologies is the only criterion for innovation which refers to the use of best available technology. However there is no standard to measure it.³⁰⁶

7. Transparency and reporting: Information sharing is the process to justify the transparency. Though there are some excuses of confidentiality, only by sharing the information the relation of corporation and the community will be developed. It is also the responsibility of the Government to inform the people about the project.³⁰⁷

8. Economic efficiency: Optimal use of financial resources is the criterion to ensure the economic efficiency though there are lacks of consensus among the stakeholders. However, the appropriate planning of cost with reasonability from available source of finance is essential.³⁰⁸

Though the survey tried to find out some well acceptable principles or standards for sustainable mineral operation, there are lacks such as environmental impact assessment and social environmental impact assessment. Therefore decommissioning and abandonment phase, which is also an important part to attain sustainability, is overlooked. Some principles also overlapped with each other, as both environmental quality and quality of life comprise of almost similar criteria except community participation.

2.7.4. Key Performance Indicator for Sustainable Production of Petroleum

Elhuni and Ahmad³⁰⁹ had conducted a study to determine the key performance indicators to ensure the sustainable oil and gas production adopting triple bottom line (consisting economic, environmental and social aspect) of sustainability. Libyan oil company having more than 6000 employees was initially surveyed to justify the indicators and then 25 managers and engineers opined regarding the weight of each indicator. The aim of the study is to provide some guidelines to the companies to ensure sustainable oil and gas production

³⁰⁶ Caron et al., "Principles and Criteria of Sustainable Development," 215-222.

³⁰⁷ Ibid.

³⁰⁸ Ibid.

³⁰⁹ Redha M. Elhuni and M. Munir Ahmad, "Key Performance Indicators for Sustainable Production Evaluation in Oil and Gas Sector," *Procedia Manufacturing* 11 (2017): 718 – 724.

with special consideration to environmental and social phenomena. Finally, the authors succeeded in drawing a hierarchy of key performance indicators to attain sustainable oil and gas production shown in Figure 2.1.

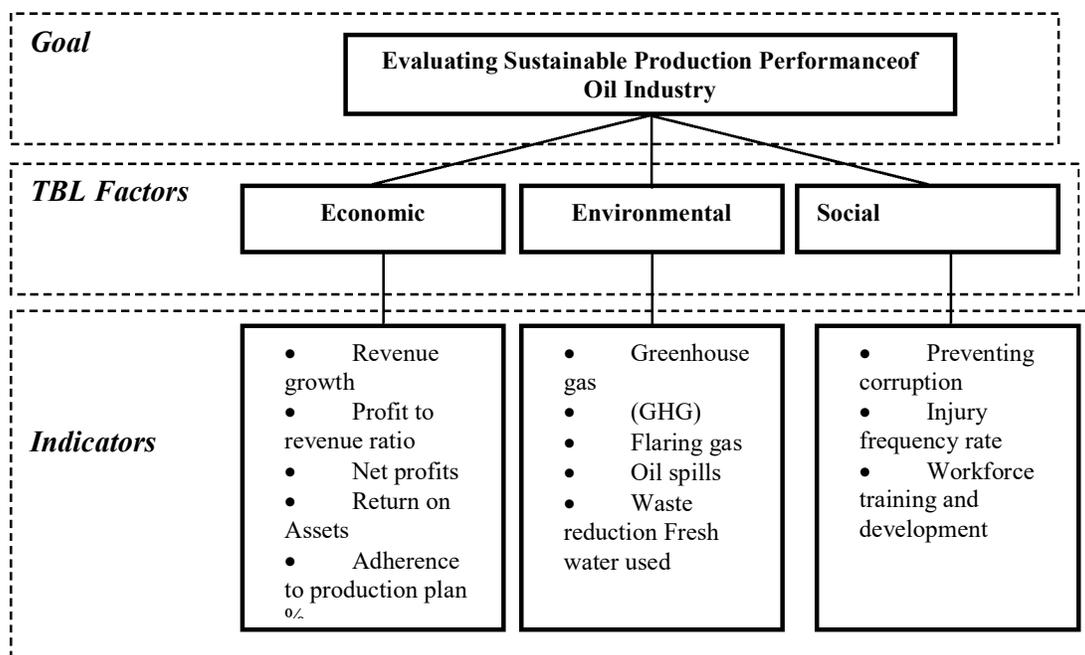


Figure 2.1 The hierarchy structure of Key Performance Indicators³¹⁰

After reviewing a number of instruments concerning the sustainable mineral and petroleum exploration, development and production, it is deemed that none of the above guidelines or the principles is comprehensive to address all the aspects of sustainable development. Moreover, the term sustainable development itself is an ambiguous term without having any standard as to address sustainability, though every sector should have some specific principles.³¹¹ Likewise, to ensure the sustainable development in the natural gas sector, there should be some guiding principles addressing the triple bottom line. There is also a concern about the fourth pillar or bottom line of sustainability known as good governance.³¹² The economic aspect covers the use of asset cost effectively, including social and environmental expenditure and improvement of trade. The social aspect indicates equal distribution of the benefit, cultural and economic freedom, social security and overall the

³¹⁰Elhuni and Ahmad, "Key Performance Indicators," 718 – 724.

³¹¹Adisa Azapagic, "Developing a Framework for Sustainable Development Indicators for the Mining and Minerals Industry," *Journal of Cleaner Production* 12, no.6 (2004): 639-662.

³¹²Mining, Minerals and Sustainable Development Project, *Breaking New Ground: Mining, Minerals, and Sustainable Development* International Institute for Environment and Development, and World Business Council for Sustainable Development, (London: Earthscan Publications Ltd, 2002), 458.

management of the resources in such a way, so that the upcoming generation should not suffer from depletion. The environmental aspect demands that the operation should be held with due respect to the environment including water, air, soil, wildlife etc, ensuring proper waste management system and taking precautionary measures in case of uncertainty. The emerging principle good governance represents that the state Government should have well-articulated laws and regulations regarding the operation, ensure institutional check and balance, transparency regarding the dealings with the corporation and participatory decision making process.

2.8 INDEXES OF SUSTAINABLE NATURAL GAS OPERATION

The above mentioned tools of attaining sustainability in mineral sector contribute a lot to determine some procedural principles to achieve sustainable development in natural gas operation. Therefore, in the light of the principles regarding international law of sustainable development and analysing the abovementioned instruments, the researcher thinks that to ensure sustainable natural gas operation the following principles should be very relevant:

2.8.1 Regulatory Framework

Operation of natural gas has a potential impact on the economic, social, environmental aspects of sustainable development including health and safety. Creating a regulatory framework incorporating the provision of sustainable development in natural gas operation is very important for the site of operation as well as the planet.³¹³ There is a high consensus among the stakeholders that a developed policy framework is capable of providing a long term benefit to the community as well as to the population, and that benefit makes a prospect of sustainable development.³¹⁴ Therefore, the responsibility lies on the Government to enact and implement a comprehensive framework for efficient management of natural gas at all phases including the exploration, development, production and decommission and balance these with the economic, social and environmental considerations. There is a variety of issues that require addressing through legislative framework for proper management of the natural gas. In order to ensure the conservation of the right of future generation, national legislations around the world should address public participation, access to information, and both physical and social environment at every stage of operation including the closure cycle.

³¹³ Society for Mining, Metallurgy and Exploration, *The Mining Industry and Sustainable Development*.

³¹⁴ Elizabeth Bastida, *Integrating Sustainability into Legal Frameworks for Mining: Trends in Selected Latin American* International Institute for Environment and Development and World Business Council for Sustainable Development, January 2002. *Countries* <https://pubs.iied.org/pdfs/G00577.pdf> accessed on February 16, 2019.

These are only possible through a regulatory framework, though there are some environmental legislations in the gas extracting countries but they are very generic in nature, not specially designed for the gas operation. Moreover the regulatory control is essential not only to address the sustainable development but also to control the international oil companies as there is a possibility that while operating in remote areas oil and gas companies become a surrogate government within a state.³¹⁵ The relationship of state as a regulator and the companies as an operator is a mutual relation; but to some extent, it becomes confrontational. So a strong regulatory framework is essential to regulate the relationship. However, when the regulation imposes greater control to the operating companies, they also expect responsibility on the regulator side. Sometimes it is deemed that the interest of the oil companies and the state are the same to maximise the production but the Government as a regulator also has to consider their petroleum objective i.e. the development of its petroleum resources. In this regard the United Nations Development Programme (UNDP) and the World Energy Council have made an assessment on the world energy and have come to the conclusion that the production and utilisation of energy should be in such a way which ensures the long lasting human development.³¹⁶ The regulatory framework should be constructed in a way to ensure what the state actually wants to do to develop its natural gas resources. Thus the State has to develop legal institutions and suitable regulatory regimes for petroleum operation. Without such institutions, there is a possibility that the State will lose control over the resource exploitation. To prevent this, regulations are formed of which some are well-articulated incorporating rights and obligations of the operating companies as well as State as regulator. Regulations are of two kinds, one is rule based regulation and the other is principle based regulation. A brief description of these two is offered below.

Rule based regulation: The scholars sometimes opine that there is a little difference between the rules based regulation and the principle based regulation. The basic difference lies in their application. Rule-based regulations describe elaborately how to behave.³¹⁷ It requires more effort as all are prescribed in detail. In such regulations the concept is very specific, particular and concrete, whereas in practical application it has no discretionary

³¹⁵ United Nations, "Berlin II Guidelines" 33.

³¹⁶ UNDP, *The World Energy Assessment: Energy and the Challenge of Sustainability*, (2000) p.3.

³¹⁷ Cristie L. Ford. *New Governance, Compliance, and Principles-Based Securities Regulation. American Business Law Journal*, 45(2008):1-60.

approach, and relatively little knowledge is required to implement it. As the nature of such regulations is rigid, in case of exceptional situations there is no flexibility.³¹⁸

Principle based regulation: Principles-based regulation refer to relying on high-level, broadly stated rules or Principles to set the standards to for the regulated firm or company to carry on their operation to follow. In principle based regulations, the operators are provided with some discretionary approach to handle the situation in case of practical application. So at first the principles are required to be tailored to a company's specific situation, before implementation.³¹⁹ General process of adaption of principle based regulation is to determine the objectives of the regulating authority and then develop the control measures therefore it is applied as a principle.³²⁰ Legal knowledge and details about the field are required to apply the principle. As the concept of the principle is general, universal and abstract, so in case of practical application exercise of large discretionary power is allowed. So to implement this, vast knowledge on the field is necessary and flexibility is permitted to handle the exceptional situations.³²¹ At present the operator prefers to choose the broad-based standards instead of detailed rules³²² that must be outcomes-based to increase management responsibility. This regulation expresses the basic obligation that should be followed by the operating corporation.

However, in case of natural gas exploitation the principle based regulation is more appropriate than the rule based regulation because as these are long term projects, the situation may vary over the period. These regulations are reason based, purposive, and widely applicable to diverse range of circumstances concerning the integrity, skilled care and due diligence from the operator side. Therefore, principle based regulations consist the provisions of criminal liability in case of breach.³²³ The nature of natural gas industry is such that sole control of the operation from beginning to end may lead to lack of fair competition and may result in monopoly.³²⁴ However, the regulation for natural gas exploration must contain

³¹⁸Grigori Antoniou, Guido Governatori and Michael J. Maher, "Representation Results for Defeasible Logic," *ACM Transactions on Computational Logic*, 2(2001): 255–286.

³¹⁹Ford, New Governance, Compliance, and Principles-Based Securities Regulation: 1–60.

³²⁰Shazia Sadiq, Guido Governatori and Kioumars Naimir, "Modeling Control Objectives for Business Process Compliance," in *Proceedings of 5th International Conference on Business Process Management* (Springer-Verlag, 2007).

³²¹Brigitte Burgemeestre, Joris Hulstijn and Yao-Hua Tan, "Rule-based Versus Principle-based Regulatory Compliance," *Legal Knowledge and Information System* 205. DOI 10.3233/978-1-60750-082-7-37.

³²²Julia Black, Martyn Hopper and Christa Band, "Making a success of Principles-based regulation," *Law and Financial Markets Review* (May, 2007): 191 -206.

³²³Black, Hopper and Band, "Making a success of Principles-based regulation," 195.

³²⁴Yi Su and Kedong Luo, "Study on the Sustainable Development of Natural Gas Resources in China," *Journal of Clean Energy Technologies* 3 no. 6 (November 2015): 445-449

environmental standards with legislative control, social acceptability and improvement of the living standard of the community and the people as a whole. In addition, the regulators should consult with the stakeholders involved in gas exploitation to provide more specific guidelines which help the operator to comply with the remedial measures.³²⁵ Moreover, the mechanism of imposing civil and criminal liability on the natural gas operator, compulsory insurance or advance payment for damages and compensation and incentive measures to maintain environmental standards where there is no specific provision about the reward of compliance should be incorporated in the regulation.

2.8.2 Environmental Management

Natural gas exploitation has some negative impact on the environment and health and safety of local community as well as the employee involved in the operation. The environmental aspect emphasises that to obtain sustainable output, the petroleum exploitation has to safeguard the natural environment and biodiversity and protect the stock of natural resource. Therefore, hazardous waste management is another significant aspect to attain sustainable natural gas development as land, water, air, agriculture, food, biosphere and ecosystem all may become the subject of contamination from the hazardous waste. History shows that a number of disasters took place in the petroleum operation throughout the world including Bangladesh, that have caused serious environmental harm. Therefore, in most of the developing countries the extraction is carried out to attain the short term gain without paying any attention to negative impacts on the environment and the local communities.³²⁶ Specially, the closing phase of the operations is completely ignored. To face these situations there is a dire need of sound environmental management system. To manage the environmental system there should be specific regulatory mechanism and in case of natural gas exploitation there are two approaches to govern the environmental regime, one is the legislative approach and another is the contractual approach. The first one refers to the general legislation that is applicable to all environmental concern at any production level to meet the national standard including the gas sector and the latter one comprises of all the relevant provisions of national laws pertinent to environmental governance of the natural gas extraction along with determining the obligation of the IOCs.³²⁷ A comprehensive approach is more appropriate for

³²⁵Burgemeestre, Hulstijn and Tan, "Rule-based Versus Principle-based Regulatory Compliance" 1

³²⁶ United Nations, "Berlin II Guidelines," 8.

³²⁷Faruque, *Petroleum Contracts: Stability and Risk Management in Developing Countries*, 145.

the natural gas exploration³²⁸ but sometimes the host states are prone to enact such a regulation whose prime object is to grant the license to the operating IOCs. However to mitigate all adverse impacts on the environment some acceptable legislative controls such as the Environment Impact Assessment, Social Environmental Impact Assessment, , monitoring the compliance by the operating companies and finally punishment for noncompliance and incentives for compliance are required. A comprehensive environmental protection provisions and well defined environmental liability in a natural gas extraction contract can co-operate the companies to avoid compliance with burdensome general legislation.³²⁹ At present the more common method to protect the environment from adverse impact of the petroleum operation is the EIA before approving any license. To make an EIA more effective the process is guided by the Berlin guidelines.³³⁰ At first the project has to be submitted before the regulatory authority, then Government will scope the issues, consult with the community and collect the baseline data in order to determine whether the EIA is required or not. After being informed of the decision, the company will prepare the environmental impact statement, then refer that to the regulatory authority and public in general for review. After that the company responds to the issues raised by the regulatory authority or by the public review and revise the environmental impact assessment accordingly. Then the regulatory authority decides whether the project will be approved or not. In case of approval, monitoring and reporting should be continued from the regulator side and the company has to maintain the communication with the government agencies and the community. It is known that the Environment Impact Assessment (EIA) comprises of the social environmental assessment. The co-ordination of the government and company is very essential as the impact of gas operation on socio-economic aspect is very complex and not so easy to understand.

2.8.3 Community Consultation and Public Participation

In natural gas operation these criteria are very significant, as on the basis of these principles the social developments are ensured. The social development indicates that the socio-cultural development will be sustainable if the proper distribution of the cost and benefit is ensured among the stakeholders and their involvement in the decision making process is ensured through dialogue and consultation.³³¹ The community consultation process is a trilateral relationship among the three concerned parties: the local community, the Government and the

³²⁸ Kais Bouslah, BouchraM'Zali, Maher Kooli and M. Turcotte, "Social and Environmental Responsibility, Certifications and Financial Performance," *Gestion* 31 no.2 (2006): 125-133.

³²⁹ Faruque, *Petroleum Contracts: Stability and Risk Management in Developing Countries*, 208.

³³⁰ United Nations, "Berlin II Guidelines," 8.

³³¹ Bastida, *Managing Sustainable Development in Competitive Legal Frameworks for Mining*

operating company; and the consultation among the three representatives contribute to establish a balanced development.³³² Thus recognising the responsibility of the parties to participate in and contribute to a decision-making process will ensure the sustainable development. The community view is very relevant to continue the operation very smoothly as the gas operation is a long term activities. There are number of externalities involved with the operation such as noise, vibration, infrastructural change and other factors, which directly or indirectly affect the local communities. Therefore, they have the right to express their opinion and to participate in the decision making process. There are differences of opinion about the free consent of the communities. Some scholars are of the opinion that even the community has the right to say ‘no’ while some of them think that the common good must get priority over the individual good.³³³ However, there should be minimisation between the common or greater good and the individual good of the host community to achieve balanced development and the Government has to play leading role to ensure the sustainable development. Consequently, it is deemed that one of the reasons of the negative environment impact is the result of the poor communication among the three concerned parties. Therefore the sustainable development of the host communities is dependent upon the liaison between the community and the operating company. In this way, creation of social and physical capital and infrastructural development in the operating area contribute to long lasting output even after the mine closure, which is followed in most of the Canadian mining companies.³³⁴ So the consultation should be ensured not as ornaments of regulation, rather it should be specific to involve the community in approval of the project in question and to assure them how they will be benefited from the operation. Other interested groups who have interest at any phase of natural gas operation also should be included in the consultation.

2.8.4 Access to Information and Good Governance

Information regarding the natural gas development, socio-environmental consequences, technological impact, mitigation measure, good business practice, implementation and monitoring or follow up process should be made available to the stakeholders to make them well acquainted with the operation. In absence of transparent information to the community and the stakeholder it is not easy to establish a basis for reliable scheme to design and administer a development programme for the region with full participation of the Government, company and the community. Access to information ensures the accountability

³³² Remy and Mac Mahon, *Large Mines and Local Communities*.

³³³ Caron, Durand and Asselin, “Principles and Criteria of Sustainable Development,” 215-222.

³³⁴ Remy and Mac Mahon, *Large Mines and Local Communities*.

of the Government and the operating companies which is essential to prevent the corruption and to put obligation on the companies to develop a business ethics.³³⁵ Therefore as the information comprises of the regulatory framework and standard, baseline information of the concerned area, environmental and social impact statement and their follow up including liability and decommission of the project³³⁶ it will help the community people to provide a thoughtful opinion to influence the decision making process. Though some of the experts consider that there are some confidential information that should not be disclosed publicly where majority is in favour of disclosing the information for social acceptability and made a reliable relationship between the community and the operating company.³³⁷ The information should be made public as early as possible to allow adequate time to scrutinise and to participate in dialogue and it is only possible if there is government intention to ensure the good governance. Mode of publication is another important aspect so that the affected community and the interested group get access to it and their view should be taken into consideration.³³⁸ In this regard the international finance corporation prescribes four principles for disclosure of the information of the mining operation. These are the early disclosure, disclosed information to be able to support the consultation and dialogue, provided information to be meaningful to understand the project and lastly ensuring the accessibility of the information.³³⁹

Transparency, which prevents the rumours, is one of the essential ingredients to ensure good governance. In any natural gas operation, a number of field works, such as geological research, mapping, exploration take place. These create curiosity among the local community which leads to the groundless rumour. If the people get relevant information transparently, then there will be no scope of spreading the rumour and public reliance will be increased which in turn will ensure good governance. The responsibility to disclose the information lies on the operating company and it is suggested that during the approval process the company should communicate with the local people and take measures to notify

³³⁵Caron, Durand and Asselin, "Principles and Criteria of Sustainable Development," 215-222.

³³⁶Alba, *Environmental Governance in Oil-Producing Developing Countries*

³³⁷Caron, Durand and Asselin, "Principles and Criteria of Sustainable Development for the Mineral Exploration Industry," 215-222.

³³⁸Bastida, *Managing Sustainable Development in Competitive Legal Frameworks for Mining*

³³⁹United Nations, "Berlin II Guidelines" 51.

them regarding the intention of the operation before they are informed from other sources.³⁴⁰ The Government is also obligated to provide such information to the public.

2.8.5 Conservation for Future Generation

One of the significant aspects of the sustainable development is to preserve the right of the upcoming generation to meet their own requirement. In this regard, the question may arise that whether it is possible to leave some gas within the mine for the future generation. Though it is not possible, this intergeneration equity can be ensured in some other ways. In this regard the gas field conservation could be the solution. Considering the need of the future generation all the fields should not be operated at a time. Because simultaneous exploitation in a number of gas fields may lead to the Dutch Diseases.³⁴¹ Government should approve as much field operation as necessary to meet the present need with due consideration of the future generation. The coming generation does not have to compromise their ability for better life if new procedures and processes are developed, greater priority are given to the recycling, use of modern technology and new materials with due consideration to the health and safety.³⁴² The primary advantage of the gas exploitation is to improve the economic, social and environmental development for the betterment of the current generation as well as the future one.

Therefore the adequate knowledge and understanding about the gas field reserves provide an opportunity to prepare a sustainable economic policy and to determine the current consumption rate to improve the intergenerational equity.³⁴³ Without proper planning in economic development the eventual depletion of the gas results in the loss of the potential advantages for the upcoming generation. All the generations including present and future have the right to exploit its petroleum resources. The question is exactly how one should reconcile the issue of intergenerational equity when exploiting non renewable resources.

³⁴⁰Toni Eerola, *Corporate Social Responsibility in Mineral Exploration –The Importance of Communication and Stakeholder Engagement in Earning and Maintaining the Social License to Operate*, (Geological Survey of Finland, 2017).

³⁴¹ The term Dutch disease is used to explain the difficult economic condition arises as a result of over-exploiting of natural resources. The term usually refers the experience of the Netherlands after discovering the large natural gas deposits in the North Sea. The export of natural gas contributed greatly in the Dutch economy and the national currency became stronger whereas higher unemployment also resulted due to the declination in the manufacturing industry. See for details Miguel de Cervates Saavedra, in Christine Ebrahim-Zadeh, 'Back to Basics - Dutch Disease: Too Much Wealth Manage Unwisely' *Finance and Development* 40 no. 1 (2003) International Monetary Fund <http://www.imf.org/external/pubs/ft/fandd/2003/03/eBra.htm> accessed on October 20, 2020.

³⁴² Society for Mining, Metallurgy and Exploration, *The Mining Industry and Sustainable Development*.

³⁴³Silvana Tordo, David Johnston and Daniel Johnston, "Petroleum Exploration and Production Rights : Allocation Strategies and Design Issues," *World Bank Working Paper Series*no. 179 (2009). <https://openknowledge.worldbank.org/handle/10986/5954> accessed January 15, 2018.

Therefore, naturally, after using any fraction of the resources, only a limited percentage of the original amount will be available for future generations. This contradicts the whole concept of equity.³⁴⁴ Depletion is inevitable and it is defined as the deviation of the energy resources value through the remaining period of the reserve supply.³⁴⁵ In an oil and gas producing country the economy is largely dependent on the petroleum for its national economic development. It ultimately leads to depletion and depletion increases the cost of the energy and concern for the future generation, environment and economy.³⁴⁶ However, the scholars conclude that there is lack of planning to make a balance between the current and coming generation to ensure the sustainable development.³⁴⁷

2.8.6 Cost Benefit Analysis

The petroleum industry is the heart of the global energy market and contributes majorly to meet the demand of energy. One of the vital factors for the petroleum or natural gas operating company is to evaluate the investment to ensure the long term development perspective that facilitate the Government to improve and optimise the energy plan of a country.³⁴⁸ When any oil or gas producing company is involved in operation, they have to invest a large amount of money, which is very significant for the economy of any country. From exploration to production a number of steps require a big amount of investment to address every phase. In case of land acquisition the price is provided 3 to 30 times higher than the market value.³⁴⁹ Therefore a number of negative impact associated with the natural gas operation like environmental degradation including the land, water, air contamination, noise, vibration, waste including the radioactive waste, fluid, gas flaring etc are very common and they affect the health and safety of the local community. Moreover probable risk of fracturing fluid or waste water leakage may happen as a result of unskilled handling of technology which can be minimised through prudent technology handling and proper supervision process. But all these initiatives ultimately enhance the project expenditure. On the other hand, evidences of

³⁴⁴Adelina Maria Menash and Luciana Camargo Castro, *Sustainable Resource Use and Sustainable Development: A Contradiction* Center for Development Research (University of Bonn, 2004). Available at https://www.zef.de/fileadmin/downloads/forum/docprog/Termpapers/2004_3b_Mensah_Castro.pdf accessed on June 7, 2018.

³⁴⁵World Bank. "Adjusted Savings: Natural Resources Depletion (% of GNI)" (2015). <http://data.worldbank.org/indicator/NY.ADJ.DRES.GN.ZS> accessed on March 16, 2019.

³⁴⁶Norfadhilah M. Ali, *Sustainability of Petroleum and Environmental Control in the Malaysian Petroleum Law*. Malaysia (2009). <http://ddms.usim.edu.my/> accessed on May 17, 2019.

³⁴⁷Abdulrazag Mohamed Etelawi, Keith A. Blatner and Jill McCluskey, "Sustainability and Depletion Accounting: A Case Study of Oil in Libya," *Environment and Natural Resources Research* 7, no. 1(2017).

³⁴⁸United Nations and Global Compact, *Sustainable Energy for all: Opportunities for the Oil and Gas Industry*, (Accenture, 2012). www.accenture.com accessed on December 11, 2020.

³⁴⁹Remy and Mac Mahon, *Large Mines and Local Communities*.

accident due to the company's intention to cut down the cost can be found in the literatures.³⁵⁰ As there is a dichotomy between the developments that take place in national level and the environmental and social harm occurred in the local community, so the cost benefit analysis may be expanded by estimating the pollutant that is introduced in the social and human environment.

The local community may reap benefit from the operation by building the social capital such as infrastructural development creating road, hospital, school etc. and job opportunity to secure the status in new social phenomenon to the land owner³⁵¹ and others because after the acquisition of land the landowner has to seek some alternative activities. These benefits are added to the development which has long lasting impact even after the closure of the natural gas operation. Moreover, to make the development sustainable, the companies should minimise environmental damage and has to comply with good business conduct to make an acceptable balance between environment and development. Though a study carried out by the petroleum industry concluded that both the national and local economy are benefited from the natural gas exploitation including employment opportunity, taxes and duties to create fund etc. however, the cost estimation of the industries is sometimes overestimated.³⁵² Now the ultimate decision lies upon the Government whether such development has any long term impact on attaining sustainable development. Yet another matter of concern is that after completion of the operation many chemicals remain underground which naturally disperse over time, but it is not possible to control or foresee. This aspect is not considered by the industry during their cost benefit analysis. So the Government has to make a regulatory framework to ensure the analysis of all the negative aspect involved with the natural gas exploitation.

On the contrary, the regulator has to keep in the mind that the regulation will not create the regulatory burden that significantly increases costs in resource extraction. To optimise the extraction of petroleum resources the regulatory framework should incorporate the concept of optimal recovery and states should enact its legislation based of overarching

³⁵⁰Jianu Daniel Muresan and Mihail Vincentiu Ivan, "Controversies Regarding Costs, Uncertainties and Benefits Specific to Shale Gas Development," *Sustainability*, 7 (2015): 2473-2489.

³⁵¹Remy and Mac Mahon, *Large Mines and Local Communities*.

³⁵²Muresan and Ivan, "Controversies Regarding Costs," 2473-2489

principle. Furthermore, strong State regulation of petroleum operation also contributes to optimising the extraction of petroleum resources from a field.³⁵³

2.9 THE SUSTAINABLE DEVELOPMENT GOALS (SDGS) AND THEIR IMPORTANCE IN THE OIL AND GAS INDUSTRY

The United Nations General Assembly adopted the Sustainable Development Goals on 25 September 2015, Agenda 2030 for Sustainable Development for the next 15 years. The leaders from 193 countries were in consensus to adopt the 17 goals to ensure better future for the generation of the next 15 years.³⁵⁴ The goals were designed to address the globally pressing socio-economic and environmental problem and assist the global community to outline their national development agenda in the light of these sustainable development goals. In addition, the participants also recognised the role of the private sector to attain these 17 SDGs. To attain the SDGs there are involvement of a number of contributors: Governments, local communities, civil society organisations, and the private sector including the oil and gas industry is essential.³⁵⁵ The SDGs³⁵⁶ are the followings:

- i. End extreme poverty in all forms by 2030.
- ii. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- iii. Ensure healthy lives and promote well-being for all at all ages
- iv. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- v. Achieve gender equality and empower all women and girls
- vi. Ensure availability and sustainable management of water and sanitation for all
- vii. Ensure access to affordable, reliable, sustainable and modern energy for all
- viii. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
- ix. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation,
- x. Reduce inequality within and among countries
- xi. Make cities and human settlements inclusive, safe, resilient and sustainable
- xii. Ensure sustainable consumption and production patterns
- xiii. Take urgent action to combat climate change and its impacts
- xiv. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

³⁵³Tina Hunter, "The Role of Regulatory Frameworks and State Regulation in Optimising the Extraction of Petroleum Resources: A Study of Australia and Norway," *The Extractive Industries and Society* 1, no. 1(March 2014): 48–58.

³⁵⁴United Nations Development Programme, "Take Actions to Sustainable Development Goals" <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> accessed on November 13, 2019.

³⁵⁵United Nations, "Transforming Our World: the 2030 Agenda for Sustainable Development," UN General Assembly A/RES/70/1, (2015).https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf accessed on July 19, 2018.

³⁵⁶UNDP, *Take Actions to Sustainable Development Goals*.

- xv. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
- xvi. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
- xvii. Strengthen the means of implementation and revitalize the global partnership for sustainable development

These goals are very interrelated and achieving one of the goals will have some positive contribution towards achieving the other SDGs. Analysis of climate change reveals that it influences a number of goals at the same time, for example, SDG 14 and 15. Again, generally the climate change affects the underprivileged group of the society, resulting in negative impacts on health and food security, which leads to extreme poverty, so SDGs 1, 2, and 3 are affected. Moreover, the intergenerational equality, which is incorporated in SDGs 10, will increase as its impacts all over the world are not the same. Ultimately, the social order is disrupted which goes against the SDG16.³⁵⁷

There is a lot of potentiality of the natural gas industry to contribute in attaining the SDGs designed by the United Nations General Assembly, especially the SDG 7 to ensure clean, reliable and affordable energy. As a fuel, natural gas is cleaner than other fuels such as oil and coal because its greenhouse gas emission is lower.³⁵⁸ The natural gas operation has both positive and negative contribution towards attaining the above mentioned sustainable development goal. An environment friendly natural gas operation can contribute in a number of ways by creating employment opportunity, revenue generation, community consultation, ensuring health and safety measures during operation, infrastructural development and industrialisation.³⁵⁹ All these steps taken by the natural gas companies during their operation contribute to attain a number of sustainable development goals such as eradication of poverty, food security, ensuring transparency, improvement of health and nutrition, creating employment opportunity, assistance in ensuring the gender equality, supply of clean and affordable energy. Though it creates some impediments on the way to achieve a few of the SDGs by having some negative impacts on climate change, conservation of ecosystem and biodiversity, sustainable water management, intergenerational equity, if natural gas industry

³⁵⁷ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas*, (2013),4. Available at http://www.ipieca.org/media/3093/mapping_og_to_sdg_atlas_lr_2017.pdf accessed May 8, 2018.

³⁵⁸ Natasha Sinclair, "Contributing to the Sustainable Development Goals in Oil and Gas," *Advisian* (September 2017) <https://www.advisian.com/en/global-perspectives/contributing-to-the-sustainable-development-goals-in-oil-and-gas> accessed on January 12, 2020.

³⁵⁹ IPIECA, IFC and UNDP, *Mapping the Oil and Gas industry*.

can adopt a sustainable extraction policy and can implement them prudently, then the natural gas operation can positively contribute to achieve those goals rather impact adversely.

However, a number of oil and gas operating companies are going to adopt some components in their planning phase of petroleum operation, for example training to the local community to engage them in the operating activities, community consultation for infrastructural development at an early stage of operation, to meet the need of the company and local community, to ensure the water development plan to ensure the sustainable water management, health and safety programme which ensure the sound productivity.³⁶⁰ All these steps of the oil and gas companies will contribute to attain a number of SDGs, designed by the United Nations General Assembly. However, the aim of the area of the study is not to analyse the contribution of natural gas industry on SDGs but to grasp the sustainable development concept in natural gas exploration and examining the petroleum policy, institutional design and organisation, and regulatory practices in the operation of natural gas in Bangladesh.

Though the concept of sustainable development has attained enormous attention around the globe, the aim of the development of this concept was to provide the proper framework for law makers, planners and decision makers so that problems regarding development, environmental safety and social responsibility could be addressed through an empirical methodology. The sustainable development concept is not adequately addressed by the natural gas industry due to its ambiguous nature.³⁶¹ Generally, the natural gas companies tend to take into consideration only the management phase as the part of sustainability. It is actually essential to integrate the major political dimensions which have significance on the operational methods of these companies.³⁶²

2.10 Conclusion

Sustainability is a guide to utilise the available resources to fulfil the requirement of human being and to maintain the environment for both present and coming generations. The natural gas operation leads to many questions and opportunity to study how this precious non-renewable resource can be well managed and ensure lasting benefit for the future generations. Now the question is whether Bangladesh is prepared to deal with its natural gas reserve and the environmental and social effects that have been associated with natural gas exploitation?

³⁶⁰ Kai Eberspaecher, "Sustainable Development in Oil and Gas," *Advisian* (September 2017) <https://www.advisian.com/en/global-perspectives/sustainable-development-in-oil-and-gas> accessed on January 10, 2020.

³⁶¹ Anis and Siddiqui, "Issues Impacting Sustainability," 115-124.

³⁶² Anis and Siddiqui, "Issues Impacting Sustainability," 115-124.

It is only possible by incorporating three main elements of sustainable development. Proper environmental management procedures comprising of laws, regulations and institutions relating to environmental issues and governance may assist in protecting the society and environment from the challenges of exploiting natural gas. Sustainable development aims to create a balance between supply and demand of non renewable resources to achieve triple bottom line: the economic, social and environment considerations.

CHAPTER THREE

EXISTING LEGAL STRUCTURE OF NATURAL GAS EXPLORATION IN BANGLADESH

The aim of this chapter is to assess the sustainable development concept in the existing policies, laws, regulations and the institutional frameworks of natural gas extraction in Bangladesh.

3.1 INTRODUCTION

Development of petroleum resources requires efficient and effective management through the application of the legislative and institutional framework and involves a number of different stakeholders including the state. The legal and institutional framework is the mechanism to attain the sustainable development of the petroleum sector.³⁶³ The legislative framework of any specific sector provides a set of rules and strategy to govern the behaviour of that sector. The legislative framework includes the Constitution, policy, legislation, rules and regulation of a country.³⁶⁴ The purpose of the legislative framework of the natural gas sector is to specify the context and the rules for administering the petroleum operation of the petroleum-producing countries.³⁶⁵ Sustainable development of natural gas is related to the policy, laws and regulations of the host country because the operating companies are under an obligation to comply with the law of the land. This factor raises the necessity of legislation at the national level, supporting the policy of the very concerned sector to enable attaining the overall objectives and development of that sector.

During the framing of any coherent legislative framework, due consideration should be paid to maintain the consistency with the existing laws, rules or regulation of the country.³⁶⁶ It is assumed, and also acknowledged by many authors, that there is a direct effect of a sound legal and institutional framework on oil and gas sector performance. The political-

³⁶³Obadia Kyetuza Bishoge et al., “The Overview of the Legal and Institutional Framework for Oil and Natural Gas Sector in Tanzania: A Review,” *Journal of Applied and Advanced Research*, 3(2018): 8-17.

³⁶⁴Natural Resource Governing Institute, “Legal Framework: Navigating the Web of Laws and Contracts Governing Extractive Industries,” *NRGI Reader* (March 2015). https://resourcegovernance.org/sites/default/files/documents/nrgi_primer_legal-framework.pdf accessed August 12, 2017.

³⁶⁵William T. Onorato and J. Jay Park, “World Petroleum Legislation: Frameworks that Foster Oil and Gas Development,” *Alberta Law Review*, 39 no. 1(2001): 70-126.

³⁶⁶*Ibid.*

institutional framework also affects investment in the upstream petroleum operation.³⁶⁷ An analysis of Norwegian Model of petroleum sector management reveals that separation of functions in the institutional framework is effective for the petroleum sector.³⁶⁸

Legal framework for the extraction of petroleum resource plays a vital role as it creates a competitive environment for the oil companies as well as facilitates the host country achieving national policy objectives.³⁶⁹ William and Jay Park³⁷⁰ have classified the overall objectives of the petroleum-producing countries as the economic agenda and the socio-political agenda. The social and political agenda comprises a number of issues including compliance with the demand of tribes, local populations and environmental activists. Though relevant research document is still very few, it is reported that poor infrastructure, unclear policies, sketchy regulation, corruption, poor governance, and lack of funds and political commitment have hindered the progress of the gas sector in Bangladesh.³⁷¹ This chapter focuses on how the petroleum sector is governed under the existing policies, laws and institutional framework of Bangladesh and it analyses the existing policies, laws, regulations, institutions and contractual framework. Therefore, the role of existing laws and institutions to achieve sustainable development of petroleum resources, is critically examined in this chapter to find out their deficiency to comply with the indexes of sustainable development of the natural gas extraction in Bangladesh.

3.2 CURRENT REGULATORY FRAMEWORK

Petroleum resources are finite, as once it is extracted, it cannot be regenerated. That is why to ensure the long-lasting benefit both for the present and the future generation, it is essential to formulate a prudent and effective policy and legislation and set up a capable institution.³⁷² Management of energy, especially petroleum, is a very challenging task for the Government of any country due to the involvement of a number of stakeholders such as public officials,

³⁶⁷Peter Toft and Arash Duero, “Reliable in the Long Run? Petroleum Policy and Long-term Oil Supplier Reliability,” *Energy Policy* 39, no. 10 (2011): 6583-6594.

³⁶⁸ Mark C. Thurber, David R. Hults and Patrick R.P. Heller, “Exporting the Norwegian Model: The Effect of Administrative Design on Oil Sector Performance,” *Energy Policy* 39, no. 9(2011): 5366-5378.

³⁶⁹ Tina Hunter, “Sustainable Socio-economic Extraction of Australian Offshore Petroleum Resources through Legal Regulation: Is It Possible?,” *Journal of Energy & Natural Resources Law* 29 (2011): 209- 227.

³⁷⁰William. T.Onorato and J. Jay Park, “World Petroleum Legislation: Frameworks That Foster Oil and Gas Development,” *Alberta Law Review*39,no.1 (Petroleum Law Eds) 70-126.

³⁷¹ M Tamim, “Policies and Priorities in Bangladesh Gas Sector Planning,” *Energy for Sustainable Development* 7, no. 2(2003): 757-765.

³⁷²Myeres K and Mohammad A. “A Short Guide to Parliamentary Oversight of The Oil and Gas Sector for Parliament of Ghana,” Natural Resource Governance Institute, New York (2012). <https://resourcegovernance.org/sites/default/files/PC-MPs-Short-Guide-On-Oil-Gas.pdf> accessed January 5, 2018.

state-owned organisations and private firms.³⁷³ The regulatory framework of petroleum operation determines the extent of the role of the Government to define the laws and policies and perform the regulatory function.³⁷⁴ It also defines the International Oil Companies' (IOCs) area of involvement and the types of the agreement under which the IOCs conduct their exploration and production activities.³⁷⁵ It is also considered the process of defining and implementing the laws and policies, which are formulated for the petroleum sector governance.³⁷⁶ The regulatory framework consists of laws and regulation of the state as a regulator to ensure the obligation of the industry as an operator which includes the best practice and other voluntary efforts of the companies. Regarding the regulation for the administration of the natural gas exploration and production, there is no single specific approach and it may vary according to the historical, political and cultural aspects of a country. Some of the countries, for example, Brazil, provide a detailed regulatory framework, while other countries such as Norway, offer a framework with some discretion.³⁷⁷ Before enacting any law or policy, the Government has to consider a number of factors, so that the laws and practices do not become merely ornamental. –The Government should foresee how effectively it will work in practical circumstances, how stringent it will be in comparative sense and whether the government organisations are capable of dealing with the specific regulations.

The global gas sector is governed by three types of regulations and these are (1) general or sector-specific legislation, (2) individually negotiated agreement system, and (3) the hybrid system.³⁷⁸ At present, the gas sector of Bangladesh is regulated through a complex organisational structure, legislative framework, and contractual agreements. Some definite steps may help achieve the goal of better regulation of the natural gas arena. These are: firstly, the sector based clear policy goals from the Government; secondly, evaluation of the existing laws to attain the goals; thirdly, if necessary, enactment of the regulations to enable the laws; fourthly, evaluating the consistency of individual licensing policy with the existing

³⁷³Bernhard G. Gunter, "Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions," *Bangladesh Development Research Working Paper Series*(BDRWPS) BDRWPS Paper No. 3 Bangladesh Development Research Center (2008). <https://ideas.repec.org/p/bnr/wpaper/3.html> accessed on April 12, 2019.

³⁷⁴Kamal Hossain, *Law and Policy in Petroleum Development*, (New York: Nichols Publishing Company, 1979), 32.

³⁷⁵Ibid.

³⁷⁶Myeres and Mohammad, "A Short Guide to Parliamentary Oversight."

³⁷⁷Pereowe Subai, "*Towards A Functional Petroleum Industry In Nigeria: A Critical Analysis of Nigeria's Petroleum Industry Reform*" (PhD Thesis, Newcastle Law School, 2014), 35.

³⁷⁸Onorato and Park, "World Petroleum Legislation," 70-126.

policy, laws and regulations; and lastly, considering how far the present system or the institution is able to attain the policy objectives.³⁷⁹

The constitution of Bangladesh provides a guideline for the regulatory framework to be developed. The policy is formulated on the ambit of the Constitution, as the effective policy is a prerequisite to involve the stakeholders in the development of petroleum resources.³⁸⁰ There is a relation between sustainable development and extraction policy of petroleum resources.³⁸¹ A policy influences all the other laws and regulations of petroleum sector by establishing a set of visions or goals. The legislation is enacted to achieve the goals set out by the policy and it is legally binding in nature.³⁸² Then, an institution is established to implement the policy and laws. To implement the legislation in practice the concerned executive authority formulates the relevant rules, regulations and model contracts.³⁸³ The model contract works as a guide to the agreement between the Government and the operating companies through securing some of the parameters.³⁸⁴ The hierarchy of the regulatory framework of the petroleum operation is given below.

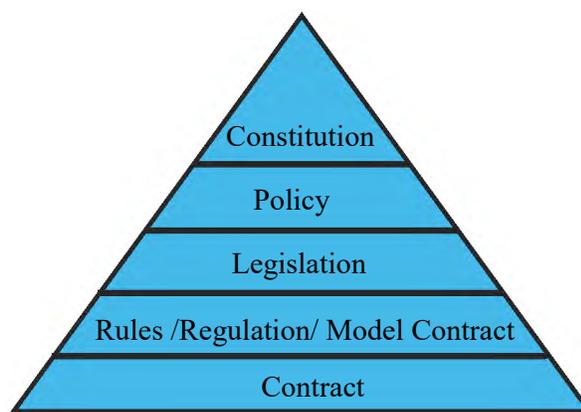


Figure 3.1 Hierarchy in a regulatory Framework of petroleum operation

3.2.1 Constitution of the People’s Republic of Bangladesh

The Constitution of Bangladesh does not expressly provide any provision regarding the operation and management of petroleum resources of the country. Some articles, directly or

³⁷⁹Myeres and Mohammad, “A Short Guide to Parliamentary Oversight.”

³⁸⁰Namuyondo, “*Sustainability and Oil Exploration*”

³⁸¹Hunter, “*Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources*”.

³⁸²Natural Resource Governance Institute, “Legal Framework, Navigating the Web of Laws and Contracts Governing Extractive Industries,” (NRGI)

https://resourcegovernance.org/sites/default/files/nrgi_Legal-Framework.pdf accessed 4 August 2019

³⁸³Ibid.

³⁸⁴Ibid.

indirectly, refer to the petroleum activities. Article 143 of the Constitution states that the ownership of all minerals and any valuable things underlying the land and ocean within the territorial sea and continental shelf of Bangladesh shall be vested on the republic. Article 13 states that the people shall own and control the instruments and means of production and distribution and to this end, three types of ownerships are recognised by the Constitution including state ownership.³⁸⁵ State ownership refers to the ownership on behalf of the people by creating efficient and dynamic nationalised public sector embracing the key sector of the economy.³⁸⁶ To this effect, Bangladesh ensures ownership of the state on all mineral resources including petroleum. As the owner of petroleum resources, the responsibility to conduct the operations for and on behalf of the people lies on the state. The supremacy of the Constitution is guaranteed by article 7(ii) of the Constitution and the Government is bound to conduct its activities according to and within the Constitution. Article 18 (a) of the Constitution imposes responsibility on the Government to endeavor to protect and improve the environment and to preserve and safeguard the natural resources, biodiversity, wetland, forest and wild life for the present and future generation. Later article 18(a) was inserted in 2011 to address the present demand of the sustainable development concept. The term ‘preserve and safeguard of natural resources’ and ‘for the present and future generation’ denote the sustainable development of petroleum resources as well as the natural gas. The article clearly reveals that the state is under an obligation of sustainable natural gas development. Article 23 expresses the obligation of the state to take steps to protect and develop the unique local culture and tradition of the tribes, minor races, ethnic sects and communities.³⁸⁷ There are some implied duties on the Government to take all the necessary steps aimed at protecting the right of those vulnerable people who are subjected to adverse impacts of the petroleum operation. That imposes the liability of the Government, before and during the petroleum operations to consult with the affected communities to protect their culture, language and lifestyle, such as the Government of Mexico adopted the method of community consultation as an obligation of the concerned ministry before conducting any petroleum operation.³⁸⁸

³⁸⁵ The others two ownerships are the co-operative ownership and private ownership.

³⁸⁶ The Constitution of the People’s Republic of Bangladesh, art. 13.

³⁸⁷ Ibid., art. 23(a).

³⁸⁸ Elizabeth C. Ramos, “Social Sustainability in Oil and Gas Projects” available at <https://eylaw.ey.com/2018/09/20/social-sustainability-in-oil-and-gas-projects/> accessed on September 25, 2019.

3.2.2 The Policy Framework

The urge of the natural gas development in Bangladesh as a source of energy was first realised in the first five years plan of 1973 to 1978.³⁸⁹ Clear policy with specific objectives is one of the fundamental requirements for the development of the petroleum resources.³⁹⁰ A comprehensive policy framework is essential to provide strategic direction for sustainable exploration and production of petroleum.³⁹¹ A successful and adaptive policy is required to accelerate strength of the private companies to exploit the petroleum, though in formulating the policy the national Government may be influenced by the political, social and economic forces of the companies.³⁹² Without sound policy better resource management becomes uncontrolled and ultimately benefit of the citizen cannot be ensured.³⁹³ Sound policy, which will be responsive in changing circumstances, is crucial to ensure sustainable development as well as to attract the IOCs in investment. In Bangladesh the Petroleum policy was formulated in 1993 after the Petroleum Act of 1974,³⁹⁴ though Foreign companies have been involved in the upstream activities since 1974.³⁹⁵

3.2.2.1 Petroleum Policy 1993

Petroleum Policy 1993 was the first and only independent petroleum policy in the history of Bangladesh. The Government of Bangladesh formulated this policy to attract the national and foreign companies, especially private investors, in this vital sector to meet the rising demand of energy.³⁹⁶ Some of the significant objectives of this policy were to ensure sustainable development of the country through systematic survey, exploration and exploitation of petroleum resources ensuring their rational use.³⁹⁷ To attract foreign investment, unique policy instrument was introduced for both the local and foreign oil companies with a view to accelerating the exploration activities. As a direct consequence of this policy, four production

³⁸⁹ Adnan Al Wahid and Nadia Rawshan, "Exploration Activities in Bangladesh Gas," *BRAC University Journal* 1, no. 1 (2004): 33-40.

³⁹⁰ Myeres and Mohammad, "A Short Guide to Parliamentary Oversight."

³⁹¹ *National Upstream Petroleum Policy for Rwanda*, Ministry of Natural Resources, Republic of Rwanda (2013), 5

³⁹² Tina Hunter, "It's time: Petroleum Policy Change for Sustainable Development in the Australian Offshore Upstream Petroleum Sector," *Journal of Applied Law and Policy* (January 2009): 31-54.

³⁹³ *Ibid.*

³⁹⁴ Haque, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," 24.

³⁹⁵ Wahid and Rawshan, "Exploration Activities," 33-40.

³⁹⁶ The Petroleum Policy 1993, Ministry of Power, Energy and Mineral Resources, Government of the Peoples Republic of Bangladesh.

³⁹⁷ The Petroleum Policy 1993, para. 2.1

sharing contracts were signed with multinational companies for exploration of natural gas or petroleum in Bangladesh.³⁹⁸

To increase the involvement of multinational oil companies, measurement of Environmental Impact Assessment was also promoted in this policy. Through the policy the joint venture exploration activities were allowed for national exploring companies with foreign one.³⁹⁹ To attract foreign investment, provision was made to avoid any kind of administration fee for signature of Production Sharing Contract (PSC). As a result of this policy, the administering fee was abolished from the Model Production Contract (MPSC) of 1997. Special consideration for offshore PSC was offered in this policy, as it stated that rate of bonuses and share of the Government will be lower than that of onshore.⁴⁰⁰ In its legal and procedural section, it suggested to amend prevailing policies and laws wherever necessary to implement this policy.⁴⁰¹ It also proposed to decide all the applications for exploration within 6 months and contested or disputed applications within 9 months.⁴⁰² Suggestions were also made to amend the confidentiality rules and to develop a database facilitating the access of exploring company on payment of fee. However, yet it is not put into action.

Therefore, provision was also added to revise the MPSC on a regular basis. Another mandatory suggestion was the pre-shipment inspection of the machinery or imported items.⁴⁰³ However, though the MPSC is updated several times after this policy, it does not include such a provision. The policy used the term sustainable development of the country through petroleum resources and the concept of sustainable development of natural gas was reflected through article 2.3(iv) that imposed obligation on the companies to carry out optimal development of oil and gas field for maximum recovery. For the protection of the environment, the policy objectives enumerate for the promotion of EIA in petroleum sector. A part was inserted in this policy to guide the compliance of the petroleum sector with formulated environmental laws and policies, as during the adoption of this policy there was no law directly addressing the environment.⁴⁰⁴ The policy also suggested to minimise social impact of petroleum operation incorporating obligation on the companies to ensure the improvement of roads, water supply, health and education facilities in the operating areas and

³⁹⁸Tamim, "Policies and Priorities in Bangladesh Gas Sector Planning," 57-65.

³⁹⁹ The Petroleum Policy 1993, para. 2.3.

⁴⁰⁰Ibid., para. 2.2.2(v).

⁴⁰¹Ibid., para 2.2.1.

⁴⁰² Petrobangla, "Petroleum Exploration Opportunities in Bangladesh," Bangladesh Oil, Gas and Mineral Corporation, Dhaka, Bangladesh (2012), 48.

⁴⁰³ The Petroleum Policy 1993, para. 2.2.

⁴⁰⁴ ibid, 2.1.x and 2.10

to improve the state of environment of that very areas.⁴⁰⁵ Actually, this policy was a milestone in the history of petroleum operation of Bangladesh.

However, though the MPSC of Bangladesh is revised on a regular basis, no law is enacted or revised guided by the policy. In spite of a significant role played by the Petroleum Policy 1993 in the development of the petroleum resources in Bangladesh, no independent policy is formulated after that. In Pakistan the petroleum policy was formulated in 1991 and then is revised on a regular basis and lastly it was done in 2012.⁴⁰⁶ India adopts policy at a regular interval with a view to attracting investment of the national and foreign company aiming at the acceleration of exploration and production to meet the rising demand of energy. New Exploration Licensing Policy (NELP) was adopted in 1997, the Integrated Energy Policy in 2008, and lastly in 2017 Hydrocarbon Exploration Licensing Policy (HELP) was formulated to correct the various drawbacks of the NELP.⁴⁰⁷ In 2013, Tanzania adopted the National Natural Gas Policy was that proposed a number of issues to be addressed through the legislation and institutional framework.⁴⁰⁸ However, such initiatives have not been taken in Bangladesh to formulate a new petroleum policy to adapt with the changing circumstances and to ensure the long lasting benefit of this sector.

3.2.2.2 The National Energy Policy 2004

The National Energy Policy (NEP) 1995 was adopted in 1995 and revised in 2004. The petroleum policy of 1993 was merged with the NEP 1995. The background of the NEP 2004 states “the Government of Bangladesh has given continuing attention to the overall development of energy sector. It involved survey, exploration, exploitation and distribution of indigenous natural gas...” It indicates that the purpose of this policy is to ensure the development of energy sector including natural gas. The energy policy outlined 10 objectives of which five are directly or indirectly related to the sustainable development of natural gas.⁴⁰⁹ These are

⁴⁰⁵The Petroleum Policy 1993, para. 11.

⁴⁰⁶Gang Lu et al., *Gas Sector Master Plan 2017* (Dhaka: Ramboll, 2018), 220.
https://mpemr.gov.bd/assets/media/pdf/Bangladesh_GSMP_Final_Report.pdf accessed on June 29, 2019.

⁴⁰⁷Ibid., 225.

⁴⁰⁸Obadia Kyetuza Bishoge, “The Overview of the Legal and Institutional Framework for Oil and Natural Gas Sector in Tanzania: A Review,” *Journal of Applied and Advanced Research* 3(2018): 8-17, available at <http://dx.doi.org/10.21839/jaar.2018.v3i1.127> accessed on June 24, 2019.

⁴⁰⁹National Energy Policy, Ministry of Power, Energy and Mineral Resources Government of the People’s Republic of Bangladesh, art.1.2 (iii)-(vii) (2004).

- (i) Optimal development of all indigenous sources of energy.⁴¹⁰ It denotes the optimal recovery from the gas fields and use of modern technology to ensure the maximum extraction,
- (ii) Sustainable operation of energy utilities.⁴¹¹ It requires that the instrument and infrastructure used in petroleum operation must be used and operated in a sustainable manner, to avoid any unexpected incident,
- (iii) Rational use of total sources of energy.⁴¹² It ensures the production according to need considering the requirement of future generation,
- (iv) Ensure the sustainable energy development programme which is environmentally sound and causes minimum damage to environment.⁴¹³ It is directly related with the sustainable development of natural gas as the environment is one of the pillars of three bottom lines and
- (v) Encourage both public and private sector for development and management of the energy sector.⁴¹⁴ It ensures good governance as it is considered the 4th pillar of sustainable development.

The first objective of this policy is to ensure the sustainable economic development recognising its relation with energy. There is a strong provision as to environment, which suggests that in all phases of the operation of any fuel's full life cycle including exploration, appraisal, extraction, conversion, transportation and consumption, environmental issues have to be addressed.⁴¹⁵ To this end, the EIA including social impact assessment have to be mandatory to initiate any new energy project⁴¹⁶ and utilisation of cost effective environment friendly technology is encouraged.⁴¹⁷ Provision of energy conservation is also proposed and to meet the emergency, the policy recommends keeping 20% of the producing wells standby.⁴¹⁸ It also recommends to consider environmental issues according to the provision provided in the policy and Bangladesh Environment Conservation Act, 1995.⁴¹⁹ Formation of strong energy advisory council is recommended which is to be constituted by the

⁴¹⁰National Energy Policy, art. 1.2.

⁴¹¹Ibid., art.1.2 (iv).

⁴¹²Ibid., art.1.2 (v).

⁴¹³ Ibid., art.1.2 (vi).

⁴¹⁴Ibid., art.1.2 (vii).

⁴¹⁵Ibid., art. 6.9.

⁴¹⁶Ibid. art. 7.1.9.

⁴¹⁷Ibid. art. 7.1.9.

⁴¹⁸Ibid., art. 6.15 (c).

⁴¹⁹ Ibid., art. 6.20.

representatives from politicians, policy makers, professionals and experts in this sector.⁴²⁰ The national exploration company BAPEX should be modernised for assessing non-renewable resources and intensive exploration in unexplored and virgin areas is suggested.⁴²¹ Enactment of new law and energy audit cell is also proposed by this policy.⁴²² Comprehensive study of the gas reserve is prioritised. Producible wells, which are now in idle state, are suggested to make productive by resources allocation along with the development of marginal gas field.⁴²³ The policy also emphasised human resources development to make sustainable energy sector in Bangladesh.

The Energy Policy of 2004 includes a petroleum policy as a separate part with the above mentioned guidelines. The objectives of this petroleum policy are to ensure the systematic survey, exploration and exploitation of the petroleum resources for sustainable development of the country; to adopt uniform policy for both private and public enterprises; to accelerate the exploration and development of indigenous petroleum resources; to develop gas fields through private sector; and to strengthen the administrative, technical and research capabilities of the Government representatives who are responsible to make policy and its implementation.⁴²⁴ The objectives also include the promotion of EIA of this sector. To attain those objectives this policy recommends the amendment of the existing laws and rules relating to petroleum sector, stipulating the time limit to decide on the exploration application within six months and on disputed application within nine months, amendment of confidentiality rules and revision of MPSC on a regular basis.⁴²⁵ It also suggests the abolition of the administering fee and joint venture is encouraged with the private company or with BAPEX. However, the administering fee was already abolished from the MPSC in 1997. Mandate is also imposed on companies to ensure maximum recovery by optimal development of oil and gas field.⁴²⁶ For the protection of environment and to ensure safety, the policy suggests to formulate three new rules along with the implementation of existing laws and rules relating to environment. The suggested new Rules are the CNG (automotive fuel) Rules and the Liquefied Petroleum Gas Rules and the Oil and Gas Exploration Safety Rules.⁴²⁷

⁴²⁰ National Energy Policy, art. 6.22.

⁴²¹ Ibid., art. 7.1.1.

⁴²² National Energy Policy art. 7.17 and 7.18.

⁴²³ Ibid., art. 7.12.

⁴²⁴ Ibid., art. 7.2.1.

⁴²⁵ Ibid., art. 7.2.2(A).

⁴²⁶ Ibid., art. 7.2.2(C)(iv).

⁴²⁷ Ibid., art. 7.2.9.

Moreover, to accelerate the production, the policy also proposes developing the marginal or abandoned gas fields.

NEP 2004 suggests a number of reformations of the existing legal, institutional and policy frameworks to create a sustainable energy sector in Bangladesh. However, implementation of these suggestions is not yet reflected. After the adoption of NEP 2004, Model PSC was revised in 2008, 2012 and 2019. Despite the recommendations of the energy policy, change is not noticed in the confidentiality clause of the MPSCs. Though the policy does not directly specify about the benefit of the future generation, it proposes to enact Energy Conservation Act, which actually reflects the interest of the future generation. However, such Act is yet to be enacted. The concept of sustainable development of petroleum resources was not incorporated in such way before formulating the energy policy in 2004. Some of the suggestions are implemented as the MPSC is revised on a regular basis. Though a few new laws are enacted addressing the downstream activities of petroleum resources, there is hardly any law enacted to enhance the exploration and production of natural gas in Bangladesh. Though The Speedy supply of Power and Energy (Special Provision) Act 2010 is enacted, it does not address the sustainable development of natural gas. Even the only law regarding the upstream operation of this resource, the Bangladesh Petroleum Act, 1974 is not amended.

3.2.2.3 Gas Sector Master Plan Bangladesh 2017 (GSMP 2017)

The gas sector master plan was finalised on 28 February 2018. The consultants of the master plan have depicted an overall picture of the demand, supply, shortages and role of legal and regulatory framework of the natural gas sector in Bangladesh and drew up a plan up to 2041. It predicts that there is no possibility of materialising any significant production within the next 6-8 years though there is an opportunity to find indigenous gas in Bangladesh upon further exploration.⁴²⁸ To meet the increasing demand of gas supply the master plan suggests to accelerate the exploration and production of gas, and develop the skill of the personnels from Petrobangla and its subsidiaries, but both requires prudent managerial and large financial support.⁴²⁹ Consultants also expect that during the period of 2021 to 2031 the domestic production may increase from 3000 Bcf (billion cubic feet) to 4800 Bcf if successful exploration and production can be continued.⁴³⁰ At the same time, it is predicted that the production from the existing field is likely to decrease and though the supply from

⁴²⁸Gang Lu et al., *Gas Sector Master Plan 2017*, 1-2.

⁴²⁹*Ibid.*, 3.

⁴³⁰*Ibid.*, 9.

the new gas fields will increase, it will cost higher.⁴³¹ With an object to uphold the present production rate BAPEX, one of the affiliated companies of Petrobangla, have planned to drill a large number of wells within few years.⁴³² The consultants also emphasised to update the legal and regulatory framework of the upstream sector with a view to increasing the exploration and production of indigenous natural gas.⁴³³

To ensure the overall development of the gas exploration and production the change of legal and regulatory framework of upstream operation is inevitable. The gas sector master plan also outlines an action plan highlighting two matters in upstream sector. These are the establishment of an independent upstream legal regulator and regulator to manage bidding rounds and granting PSCs.⁴³⁴ Bangladesh is one of the fast growing economies of the South Asian region and one of the preconditions to uphold this growth is the constant energy supply with reasonable cost. If the energy becomes clean energy then the growth will be sustainable and ensuring the clean and affordable energy is one of the sustainable development goals (SDG), which is the mandate of the Government of Bangladesh. In this case, natural gas plays the dominant role as a clean and affordable energy. To fulfill this purpose the gas sector master plan has adopted long-term development strategy. Considering this matter this plan has focused on the assessment of oil and gas exploration alongside developing a road map to enhance the reserve as well as to develop the gas field to meet the increasing demand. The master plan also has emphasised on the legal and regulatory reform.⁴³⁵ Policy makers have to make the policy flexible, so that it is capable of meeting the urgent need. Yet another important matter of upstream operation is the technology. On this issue, the master plan has observed that due to usual technical problem, actual gas production is lower than the average capacity of the production.⁴³⁶

In Bangladesh, the rate of discovery of gas is one in every three drillings, which is very satisfactory, but in most cases the volume of gas reserve is not satisfactory.⁴³⁷ It is shown that only 8% of total Gas Initially in Place (GIIP) is available in 50% of the 26 gas fields and in the largest 10% of the gas fields the GIIP is 56%.⁴³⁸ In this case, extraction of gas from the fields of lowest GIIP is not sustainable. It has been mentioned by the researcher

⁴³¹Gang Lu et al., *Gas Sector Master Plan 2017*, 1-215.

⁴³²Ibid., 18.

⁴³³Ibid., 22.

⁴³⁴Ibid., 22-23

⁴³⁵Ibid.,24-25

⁴³⁶ Ibid., 47

⁴³⁷ Ibid., 93

⁴³⁸Ibid.,123-24

in second chapter that cost-benefit analysis is one of the preconditions of sustainable gas extraction. Therefore cost minimisation should be considered. Another matter of consideration is that when enough information is gathered after each exploration, there will be a reduction in exploration cost in the adjacent areas of successful gas fields, and it may reduce the uncertainties of GIIP. It will also help ensure the cost-benefit analysis.⁴³⁹ A large part of Bangladesh is remained unexplored and the consultants predict that the size of *yet to find petroleum resources*⁴⁴⁰ in Bangladesh is similar to that under present production. However, it is acknowledged that in Bangladesh historically there are some lacks in exploration and production activities.⁴⁴¹ The master plan suggests some guidelines to increase the production by increasing the number of wells, following state of the art reservoir management, finding new gas field in undiscovered area etc.

National Energy Policy 2004, emphasised the optimum development of indigenous energy sector along with environmentally sound sustainable energy development with minimum damage to the environment. This actually refers to sustainable development of the petroleum resources.⁴⁴² One of the significant aspects of the MPSC in Bangladesh is that the profit share is biddable; which are more flexible compared to that of India and Myanmar.⁴⁴³ The master plan recognises the performance of Bangladesh regarding the bidding and contract awarding phase while performance guarantee and time schedule and procedure of payment to suppliers is not satisfactory compared to that of other regional countries.⁴⁴⁴ The institutional set up of Bangladesh and the pre-fixed gas price are marked as the reasons for low response in the bidding round including bindings to sale the gas in the domestic market.⁴⁴⁵ Establishment of an independent upstream regulatory authority to be operated under the concerned ministry having no policy function is recommended in the gas sector master plan to overcome these problems.⁴⁴⁶

⁴³⁹Gang Lu et al., *Gas Sector Master Plan 2017*,129.

⁴⁴⁰ The recoverable gas reserve is divided into proven, probable and possible with an addition of yet to find gas reserve. According to geological and engineering data, proven reserve means which can be estimated with reasonable certainty of recovery, the probable reserve denotes those unproven reserve more likely to be recoverable, possible reserve signify those unproven reserve which are less likely to be recoverable than probable reserve. In case of probable reserve, probability of recovery is 50% whereas in case of possible reserve the probability is 10%. These proven, probable and possible reserves are called the 3P. Yet to find gas reserve means which is expected to be recover from existing gas field beyond the 3P, along with upcoming and accelerated future exploration activities. Gang Lu et al., *Gas Sector Master Plan 2017*, 102-12.

⁴⁴¹*Ibid.*,128

⁴⁴²*Ibid.*,39.

⁴⁴³*Ibid.*,185

⁴⁴⁴*Ibid.*,185

⁴⁴⁵*Ibid.*, 185

⁴⁴⁶*Ibid.*, 187

3.3 THE LEGISLATIVE FRAMEWORK

The legislative framework comprises both the laws and policies to develop the petroleum resources and a number of relevant laws and policies are enacted time to time. In the sub-continent, before the beginning of the exploration activities, the petroleum resources were governed by The Petroleum Act 1899, which was repealed by The Petroleum Act 1934,⁴⁴⁷ though the first exploration of petroleum started in 1908.⁴⁴⁸ However all kind of mining activities is run according to the Mines Act 1923.

3.3.1 The Mines Act 1923

The Mines Act 1923 was the first mineral legislation in the country. Government was empowered to appoint chief inspector and inspectors with the responsibility of examining and making inquiry regarding the state and condition of any mine or any part thereof, the ventilation facility and the sufficiency of the by-laws relating to the mine in addition to all other matters concerning the safety of the employees of the mine.⁴⁴⁹ The chief inspector and the inspectors may authorise any person, in order to serve the republic, to enter the mine and survey or measure the mine or any part thereof with a prior notice of 3 days to the manager of the mine.⁴⁵⁰ There is also a mining board consisting of seven members and a committee comprising four members, both having the power of a civil court regarding the production of document, attendance of witness, records of the information of the chief inspector or inspectors or the owner, agents or miners. They can intimate their decision to them and furnish a report regarding this to the Government.⁴⁵¹

Section 9 of this Act confirms the confidentiality of the information, disclosure of which amounts to breach of the official trust, and is subject to punishment. This provision of the colonised period is still present in all types of contracts and agreements in Bangladesh relating to petroleum. Even now, there is no access to information about the terms and contracts of the actual PSCs. The responsibility to conduct the mining activities according to this Act or any Rules, Regulation and Bye-laws made under it is imposed on the manager, agent and owner of the mine.⁴⁵² Some provisions are included regarding the health and safety of the employees, along with the provision of fire controlling measures. Moreover, it is the responsibility of the owner, agent or manager of mine to give notice to proper authorities if

⁴⁴⁷ The Petroleum Rules 1937, s 2.

⁴⁴⁸ Haque, “*Effects of Petroleum Legislation*,” 16.

⁴⁴⁹ The Mines Act 1923, Government of the People’s Republic of Bangladesh, ss. 4 and 6.

⁴⁵⁰ *Ibid.*, s 7.

⁴⁵¹ *Ibid.*, ss 10-12.

⁴⁵² *Ibid.*, s 16.

any loss of life or serious bodily injury or an accidental explosion, ignition, outbreak of fire or eruption of water occurs in or about a mine. Under these circumstances, the Government appoints a duly qualified person to conduct the inquiry and to make a report thereof stating the causes of the accident, circumstances and any other observance made by him.⁴⁵³ It is noticed from the Act that the environment was not a matter of concern of this Act as it was enacted in 1923 and during that period, the concern about the environment was not developed throughout the world. There are number of provisions to avoid the accident and to secure the health and safety matters that are implicitly related to the environmental concern.

3.3.2 The Petroleum Act 1934

The aim of the Act was to consolidate and amend the laws relating to the import, transport, storage, production, refining, blending, or reclaiming by recycling of petroleum and other inflammable substances.⁴⁵⁴ Though the term production was incorporated in the preamble of the Act, there was very little provision regarding the production of the petroleum resources, where the topic of exploration was utterly excluded. Section 5 of the Act provides that

(1) No one shall produce, refine, blend or reclaim by recycling petroleum save in accordance with the rules made under sub- section (2).

(2) The Government may make rules

(a) prescribing the conditions subject to which petroleum may be produced, refined, blended or reclaimed by recycling and

(b) regulating the removal of petroleum from places where it is produced, refined, blended or reclaimed by recycling and preventing the storage therein and removal there from, except as Class I petroleum of any petroleum which has not satisfied the prescribed tests.⁴⁵⁵

Section 13 deals with the provision regarding the inspection of the places, it provides that

Where petroleum is being imported, stored, distributed, produced, refined, blended or reclaimed by recycling or is under transport, and inspect all receptacles, plant and appliances used in connection with petroleum in order to ascertain if they are in accordance with the provisions of this Chapter and the rules made there under.⁴⁵⁶

In fact, the petroleum Act 1934 was the first law in this subcontinent regarding the development of the petroleum resources but it said very little about the production of the petroleum. The focus of the Act was on import, transport and storage of the petroleum

⁴⁵³The Mines Act 1923, ss 20-21.

⁴⁵⁴ The Petroleum Act 1934, Government of the People's Republic of Bangladesh, pmbl. (Repealed in 2016)

⁴⁵⁵Ibid., s 5.

⁴⁵⁶Ibid., s 5.

resources. The reason behind this may be that there was very little upstream activities at that time, especially production.

The term production was mentioned in sections 5, 13 and 14 of the petroleum Act in a very limited way. It was assumed that the details would be found in the Rule that would be made to implement the Act. However, following the Act, a Rule was made thereof named as the Petroleum Rules 1937. Both the Act and the Rule were enacted in this subcontinent during the British period. An interesting matter is that a Petroleum Act was enacted in the United Kingdom with the same title and at same time as The Petroleum (production) Act 1934 where the state ownership over petroleum resources were ensured. Therefore, the Act of UK recognised the exclusive right of the state to search, bore for, and get the petroleum resources as well as to grant the license for the same purpose.⁴⁵⁷ However, such provisions were not incorporated in both in the Petroleum Act 1934 and the Petroleum Rules 1937 in the Indian subcontinent. Finally, this Act is repealed by the Petroleum Act 2016.

3.3.3 The Petroleum Rules 1937

The petroleum Rules 1937 was prescribed to provide a complete guideline to the petroleum Act 1934. Surprisingly neither The Petroleum Act 1934 nor The Petroleum Rule 1937 did provide any definition of production of petroleum resources. Although section 5, 13 and 14 of the Act mentioned the term production and said that the details in this regard would be found in the subsequent rules, not a single provision about the production of petroleum was included in The Petroleum Rules 1937. The main areas that were addressed through Petroleum Rules were the importation, transportation, storage and licensing process of these downstream activities.⁴⁵⁸ Some exploration activities were carried on in a scattered manner during this period, but both the Act and the Rules failed to address this issue. Both the Act and the Rules incorporated no provision regarding the protection of environment during the downstream functions, though some precautionary measures were inserted to prevent accidents. For example, article 91 provided the provision of precautionary measures from fire in case of storage;⁴⁵⁹ section 64 stated that the loading and unloading of petroleum should be conducted at a reasonable distance from the fire and other igniting inflammable substances and vapor;⁴⁶⁰ section 58 stated that the buckets of dry sands had to be placed in the same transport of the petroleum; and section 65 provided the provision of fire extinguishing tools

⁴⁵⁷ The Petroleum (Production) Act 1934, The parliament of United Kingdom, ss 1 & 2.(Repealed in 1999)

⁴⁵⁸ The Petroleum Rules 1937, Government of the People's Republic of Bangladesh.

⁴⁵⁹ Ibid.,s 91.

⁴⁶⁰ Ibid., s 64.

to be carried on during the petroleum transportation.⁴⁶¹ In these provisions, the prevention of accident was implicitly incorporated but it was included under the heading “prevention of accident” in section 24. Another important aspect of this Rule is that though the term environment was not explicitly mentioned, section 25 indirectly represented the environmental aspect. It stated that

“All due precautions shall be taken at a time to prevent any escape of petroleum during transport especially into any drain, sewer, harbour, river or water course.”⁴⁶²

Though petroleum transportation is part of the downstream operation, for the first time consideration was given to the environmental ingredient along with human beings. While environment is the inevitable part of the human life, it was not recognised at that time. Actually, both the Act and the Rules were mainly for the downstream activities. At that time there was no production of petroleum in this region, so this upstream section was less prioritised. After a decade, in 1948, an Act was passed titled as The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948.

3.3.4 The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948

The Act was enacted to regulate the Mines and Oil-fields and to develop the Mineral resources.⁴⁶³ In this Act, there was no specific guideline to conduct the upstream operation of petroleum resources. Section 2 of this Act empowered the Government to make Rules determining the terms and conditions of granting or renewal and refusal or revocation of exploration and prospecting license, mining lease and mining concession. The Act made provision to make Rule for determining tax, royalties and rents payable by the licensees, leasees and the guarantees. In addition to the above mentioned issues, provision to control production, storage and distribution of mineral resources and fixed price to buy and sell these resources supposed to be included in the Rule.⁴⁶⁴ Other parts of the Act were mainly concerned about the downstream activities of petroleum and other mineral resources. Following the Act, a Rule was made in 1949 to elaborate the provisions of the Act and to implement it. This Act was repealed by the Bangladesh Petroleum Act 1974.

⁴⁶¹ The Petroleum Rules 1937, s 64.

⁴⁶² The Petroleum Rules 1937, s 25.

⁴⁶³ The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, Act No.XXIV of 1948, pmbl (1948).(Repealed in 1974).

⁴⁶⁴Ibid., s 2.

3.3.5 The Pakistan Petroleum (Production) Rules 1949

Following the Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948, a Rule was formulated in 1949. The Rule made detailed provision of the Act. Some of the provisions were mainly related to the concept of sustainable development such as the term due diligence was used for licensee during the period of survey and exploration of petroleum.⁴⁶⁵ The oil mining lease was also granted by Government under section 29 and before granting of mining lease, a topographical survey was supposed to be conducted by the Government at its own cost.⁴⁶⁶ According to article 35, lease was bound to act according to good oil field practices. The leasee would consult the petroleum directorate regarding the appointment of local personnel in oil and gas producing activities.⁴⁶⁷ Paragraph 26 of part 2 of second schedule of the Pakistan Petroleum Production Rules 1949 clearly stated that the licensee should perform in proper and professional manner. Some obligations were also imposed on the licensee to prevent the flow and escape of waste of petroleum in the very land where it was found. Provisions were also made to ensure the prevention of damages and entrance of water through boreholes and wells of petroleum bearing strata and to prevent the leakage of petroleum in water-well, spring, stream, river, lake, reservoir, estuary and harbor. Paragraph 26(f) of this schedule affirmed that minimal damage were caused to land, trees, crops, building, structure and other property thereon.⁴⁶⁸ This Rules indirectly reflected the environmental aspect through these provisions.

Paragraph 41 of part III of the second schedule imposed obligation to deliver boreholes and well in good order and Paragraph 43 and 44, included provisions to ensure the health and safety measures of workers and avoid harmful method of working. Paragraph 46 of this part, clearly stated about disposal of wastages in a manner and in such places as not to causes harm to the localities and petroleum producing areas. It is noticeable that though the term environment was used nowhere in the Act and the Rule, a number of environmental aspects likely to be affected from petroleum operation were covered by this Rule. The term sustainable development was not familiar during the formation of this Rule but some of the components of sustainable petroleum operation were reflected in a number of articles of this Rule, for example, little damage to land, crops, building structure and other property, disposal of wastage saving the localities and petroleum producing areas etc.

⁴⁶⁵The Pakistan Petroleum (Production) Rules 1949, cl. 9.

⁴⁶⁶Ibid., cl. 33.

⁴⁶⁷Ibid., cl. 39(c)

⁴⁶⁸Ibid., para. 26.

3.3.6 The Bangladesh Petroleum Act 1974

In Bangladesh the upstream operation of petroleum is governed mainly by this Act. In the year 1973, a comprehensive policy was suggested to introduce a new regulatory framework with a view to accelerating rapid exploration and production to protect the interest of the nation.⁴⁶⁹ In this Act, some guidelines are incorporated to foster the exploration and production activities of petroleum resources for the first time in the history of Bangladesh. In its very beginning, it is stated that The Bangladesh Petroleum Act is

“An Act to provide for the exploration, development, exploitation, production, processing, refining and marketing of petroleum.”⁴⁷⁰

The meaning of petroleum is clearly defined by this Act.⁴⁷¹ Another significant aspect of the Act is that it incorporates the doctrine of “permanent sovereignty over natural resources” which was affirmed by the General Assembly of United Nations in 1962⁴⁷² and reaffirmed in a more comprehensive form in 1966.⁴⁷³ Section 3(1) of this Act provides

The Government shall have, within the territory, continental shelf and economic zone of Bangladesh, exclusive right to explore, develop, exploit, produce, process, refine and market petroleum.⁴⁷⁴

Bangladesh has recognised its sovereignty over natural resources not by this Act only, the Constitution of the people’s republic of Bangladesh also recognises the sovereign rights over mineral resources through article 143. In Bangladesh, like in many countries of the world, this right is incorporated in the Constitution, just as Indonesia in 1945 recognised state’s sovereign rights over natural resources found both in the land and under the water by article 33 of their Constitution.⁴⁷⁵ The ownership of petroleum resources vary from country to country. In some countries, the ownership of petroleum is vested on state, while in some countries it is vested on individuals, i.e. the resource belongs to the owner of the land and in some other countries, it is vested on the people of the state with some restriction not to

⁴⁶⁹Haque, “*Effects of Petroleum Legislation*,” 1.

⁴⁷⁰The Bangladesh Petroleum Act 1974, Act no. LXIX of 1974, Laws of Bangladesh, Government of the People’s Republic of Bangladesh, pmbl.

⁴⁷¹ibid, s 2(c).

⁴⁷²<http://Cil.Nus.Edu.Sg/Rp/II/Pdf/1962%20General%20Assembly%20Resolution%20On%20Permanence%20Sovereignty%20Over%20Natural%20Resources-Pdf.Pdf>

⁴⁷³United Nations Yearbook, 1966.

<http://Untreaty.Un.Org/Cod/Unjuridicalyearbook/Pdfs/English/Byvolume/1966/Chpiii.Pdf> Accessed June 12, 2019.

⁴⁷⁴The Bangladesh Petroleum Act 1974, s 3(1).

⁴⁷⁵Ainna Vilengi Kaundu, “*Analysis of the Legal Framework for State Participation in The Petroleum Industry: A Case of Namibia*,” (LLM Thesis University of Pretoria), 18.

delegate the right of exploration and production to any private person.⁴⁷⁶ However, section 3 of this Act also provides the right to the Government to explore, produce, develop, transmit and distribute petroleum resources.

Bangladesh petroleum Act was enacted in 1974 just after the Stockholm declaration and some provisions were included to address the environmental issues. For example, section 6 states that

- (1) It shall be the duty of any person engaged in any petroleum operation-
 - (a) to ensure that such petroleum operation is carried on in a proper and workmanlike manner and in accordance with good oil-field practice;
 - (b) to carry on petroleum operation in any area in a manner that does not interfere with navigation, fishing, and conservation of resources of the sea and sea-bed;
 - (c) to consider factors connected with the ecology and environment.
- (2) In particular, and without prejudice to the generality of the foregoing provision, a person engaged in any petroleum operation shall, in carrying on such operation in any area,-
 - (a) control the flow, and prevent the waste or escape, in that area of petroleum or water;
 - (b) prevent the escape in that area of any mixture of water or drilling fluid with petroleum or any other matter;
 - (c) prevent damage to petroleum bearing strata in any area, whether adjacent to that area or not;
 - (d) keep separate each petroleum pool discovered in the area;
 - (e) prevent water or any other matter entering a petroleum pool through wells in that area, except when required by, and in accordance with, good oil-field practice.⁴⁷⁷

No guideline is provided regarding the manner in which the Bangladesh Oil, Gas and Mineral Corporation (Petrobangla) will discharge those duties and ensure the compliance of the national and international oil companies, with the above obligation defined by this Act. Section 11 mentions the Rule making power of the Government, but till now no Rule is made under this Act specifying detailed upstream petroleum operation. However, the wide discretionary power is delegated to Petrobangla as there is no detailed elaboration of the Act to implement it. It is noticed that following the petroleum Act of 1934 a Rule was formulated in 1937, thereafter following The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948, a Rule was adopted in 1949. But till now no Rules is prescribed under the Bangladesh petroleum Act which was enacted in 1974.

This Act imposes responsibility on oil companies, engaged in the operation to conduct the petroleum operation in an eco-friendly manner without prejudice to the environment and ecology. Whereas the role of the Government in this regard is not clearly defined, the rights of the state to extract petroleum resources is guaranteed by section 3 of this Act. Actually, inclusion of environmental provision was the reflection of the Stockholm Declaration without

⁴⁷⁶ Kaundu, "Analysis of the Legal Framework," 15.

⁴⁷⁷ The Bangladesh Petroleum Act 1974, s 6.

any compliance mechanism. This is the only law to conduct the upstream operation of the natural gas or the petroleum resources. However, some other laws and regulations need to be considered by the operating companies during the petroleum operation. However, the Bangladesh Petroleum Act, 1974 overlooks some of the crucial points. In it, there is no provision of sustainable extraction to ensure long-term development. The issue of public participation and stakeholder involvement, which is very significant to ensure the sustainable upstream operation of petroleum, is not included in this Act. Effective management of the petroleum resources depends on how the industry regulation, direct indigenous participation and utilisation of petroleum revenues work in their relevant field.⁴⁷⁸ The Act requires the practice of good oil field manner which varies from company to company. In this regard, the national law should outline the rights and responsibilities of the companies engaged in the petroleum operation. When the companies conduct their operation in a country, they are under obligation to comply with the law of the land. Till now, any Rule is not framed under the Act for detailing the rights and liabilities of the Government and the contracting parties conducting the operation. Whereas in Peru the petroleum Act consists of 17 titles and 60 articles and a number of appendices defining technical standards of discharge and emission in every phase of petroleum operation.⁴⁷⁹ This Act of Bangladesh gives the authority a wide discretionary power as there is no detailed elaboration.

The Mines and Mineral Resources (Control and Development) Act 1992, under which The Mines and Mineral Rules 2012 is formulated, can be compared to the Petroleum Act of 1974. This Act is not applicable to petroleum resources as petroleum is governed by the Petroleum Act 1974, but it is mentionable that a detailed Rule is framed to govern the extraction of other mineral resources, which comprises a number of provisions such as the provision of compensation by the license holder where the operator is responsible for destruction of mine, to ensure sustainable extraction. It also ensures the payment of compensation for any damage caused by the operator according to Bangladesh Environment Conservation Act 1995.⁴⁸⁰ It also has a separate provision to protect the environment, which imposes obligation on the operator to act according to existing environmental laws of Bangladesh and to plant trees around the operating areas. Therefore the operator also requires

⁴⁷⁸Subai, "Towards A Functional Petroleum Industry in Nigeria," 28

⁴⁷⁹ Jacqueline L. Weaver, "Sustainable Development in the Petroleum Sector" Energy Law and Sustainable Development" edited by Adrian J. Bradbrook and Richard L. Ottinger, *IUCN Environmental Policy and Law Paper* No. 47, The World Conservation Union (2003), 25

⁴⁸⁰ The Mines and Minerals Rules 2012, Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources, The People's Republic of Bangladesh, art. 18.

to fill up the borehole and if it is not possible to fill up, then to convert it into ponds for pisciculture.⁴⁸¹ Another significant provision is that if any damage occurs to mineral resources due to negligence, lack of supervision or due to carrying out the operation in an unscientific manner, the license holder or leaseholder is responsible to pay compensation for the damage or loss.⁴⁸² By formulating a Rule under the existing laws, extraction of mineral resources other than petroleum is governed in a way that defines in detail the obligation of the operator to conduct the operation in an environment friendly way. But such initiatives are not taken in the extraction of natural gas or petroleum resources in the country.

3.3.7 The Bangladesh Oil, Gas and Mineral Corporation Ordinance 1985

The Bangladesh Oil, Gas and Mineral Corporation, popularly known as Petrobangla,⁴⁸³ was established under this Ordinance. Before this, the Bangladesh Mineral Exploration and Development Corporation was established under the Bangladesh Mineral Exploration and Development Corporation Order, 1972; and Bangladesh Oil and Gas Corporation was established under the Bangladesh Industrial Enterprises (Nationalisation) Order, 1972.⁴⁸⁴ Before 1985 there were two organisations, one was for mineral resources and the other was for oil and gas, i.e. petroleum resources. Both of the organisations were merged and Petrobangla was established in 1985 and it became responsible for development of mineral and petroleum resources. According to this Act, the board of directors are highly empowered as all the affairs and business of the corporation are vested on them.⁴⁸⁵ The function of the Petrobangla is clearly defined by this Act as it states

- (1) The functions of the Corporation shall be-
 - (a) to undertake research in the field of oil, gas and minerals;
 - (b) to prepare and implement programmes for the exploration and development of oil, gas and mineral resources;
 - (c) to produce and sell oil, gas and mineral resources; and
 - (d) to perform such other functions as the Government may, from time to time, assign to the Corporation.
- (2) Without prejudice to the generality of the foregoing provisions, the Corporation shall, in particular, have power-
 - (a) to undertake research for alternative use of natural gas;
 - (b) to carry out geological, geophysical and other surveys for the exploration and development of oil, gas and mineral resources;

⁴⁸¹ The Mines and Minerals Rules 2012 art. 42 and 56.

⁴⁸² The Mines and Minerals Rules 2012, art. 26.

⁴⁸³ The Bangladesh Oil, Gas and Mineral Corporation Ordinance, 1985, s 2.

⁴⁸⁴ Ibid., s 24(c).

⁴⁸⁵ Ibid., s 5.

- (c) to carry out drilling and other prospecting operations to prove and estimate the reserves of oil, gas and mineral resources and collect all data required for adopting the most suitable extraction and mining method;
- (d) to set up mining industries and to continue production and sale of the mined commodities;

All the responsibilities to explore, produce and develop mineral resources including petroleum is vested on Petrobangla. The governance of petroleum in upstream sector of Bangladesh is conferred with Petrobangla and some of the indicators of good governance in petroleum sector are not present in this Ordinance. Provisions of accountability in decision making and performance,⁴⁸⁶ as well as transparency and accuracy of information⁴⁸⁷ of the Petrobangla are not defined. However, during the enactment of this Ordinance, the concept of sustainable development was in developing stage and did not possess any provision to ensure the benefit of the future generation which is one of the requirement of sustainable development of petroleum resources.⁴⁸⁸

Section 18 of the Ordinance states some instruction about the audits and accounts of the corporation, aiming to ensure the economic accountability of the corporation. There is no guideline regarding remedial measures if the auditor finds any irregularity in their account statement and balance sheet. Petrobangla is the only organisation with the responsibilities of exploration, production and development of petroleum resources, alongside which it also performs supervisory and regulatory functions. Its prime responsibility is to facilitate the optimum exploration and extraction of petroleum resources and to increase the state participation in exploration and extraction activities. In every petroleum producing country, there is such an organisation to regulate the exploration and production activities. For example, in Norway the Norwegian Petroleum Directorate (NPD), which plays a vital role to protect national interest in petroleum management, works along with the national oil company Statoil,⁴⁸⁹ and in Brazil the Brazilian Petroleum Industry (BPI), which is solely responsible for petroleum resource management there, works with the national oil company Petrobras.⁴⁹⁰ Participation of a state directly in petroleum operation through an organisation or national oil company is considered an essential step for national development though there

⁴⁸⁶Myeres and Mohammad, "A Short Guide to Parliamentary Oversight."

⁴⁸⁷Ibid.

⁴⁸⁸Myeres and Mohammad, "A Short Guide to Parliamentary Oversight."

⁴⁸⁹ Norwegian Petroleum Directorate, *History* (2005) <http://www.npd.no/en/About-us/Organisation/History/> Accessed October 12, 2018.

⁴⁹⁰ Joao Santos Coelho Neto, "Risk-Bearing Service Contracts in Brazil," *Journal of Energy and Natural Resources Law* 3(1985):114 cited in Kaundu, "Analysis of The Legal Framework for State Participation in The Petroleum Industry," 14

is a threat that the organisation will become “a state within a state” if proper accountability is not ensured.⁴⁹¹ In Bangladesh, Petrobangla is the regulator as well as the participant in petroleum operation, which may lead to lack of accountability.

However, most of the natural gas developing countries in the world suffer from inefficiency of the upstream regulator. For example, India also feels their need to establish an independent upstream regulator like the NPD to conduct their petroleum operation more sustainably.⁴⁹²

This study will try to find out a more balanced way to regulate and ensure state participation in petroleum operation. There is always a faith within the mass people that the national petroleum industry performs its function for the greater interest of the state. This study also tries suggest a more balanced regulatory framework so that this faith of the people is maintained.

3.3.8 The Bangladesh Gas Act 2010

The preamble of this Act states that the Act is enacted to transmit, distribute, sell, supply and storage and to ensure the proper and just utilisation of natural gas and its associated liquid hydrocarbon derived from the whole territory of Bangladesh, specifically seabed, subsoil and exclusive economic zone.⁴⁹³ The Act makes it clear in its very beginning that the objectives of this Act are to address the downstream activities of the natural gas of Bangladesh. It makes some penal provisions for the violation of the terms and conditions of this Act relating to transmission, distribution, sell, supply and storage of the natural gas.⁴⁹⁴

3.3.9 The Speedy supply of Power and Energy (Special Provision) Act 2010

Bangladesh was facing an acute power and energy crisis since 2006,⁴⁹⁵ and this law was enacted in 2010 to meet the crisis within a short time and for quick disposal of contracts of power and energy sector. It was enacted for a period of two years and was subject to

⁴⁹¹ Myeres and Mohammad, “A Short Guide to Parliamentary Oversight .”

⁴⁹² AnmolSoni and Anomitra Chatterjee, “Governance of the Petroleum and Natural Gas Sector in India: A Status Note,” The Energy and Resources Institute, *TERI-NFA Working Paper Series* no. 15, (March 2014), 16 <https://www.teriin.org/projects/nfa/2008-2013/pdf/working-paper-15-Governance-of-the-petroleum-and-natural-gas-sector-in-india-a-status-note.pdf> accessed on May 19, 2018.

⁴⁹³ Bangladesh Gas Act, 2010, Act No. 40 of 2010, Bangladesh gazette, Government of People’s Republic of Bangladesh, pmb. Author herself translated from Bangla, the translation is not authentic. <http://bdlaws.minlaw.gov.bd/act-1052.html> accessed May 12, 2019.

⁴⁹⁴ Bangladesh Gas Act, 2010, s 10.

⁴⁹⁵ M. Azizur Rahman, “Bangladesh Cabinet approves 4-year Extension of Special Law for Energy, Power Projects,” S & P Global Platts, August 27, 2014, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/082714-bangladesh-cabinet-approves-4-year-extension-of-special-law-for-energy-power-projects> accessed on January 9, 2020.

extension or rescission.⁴⁹⁶ The provision of this Act is very controversial and not compatible with the concept of sustainable development. The Government formed a special committee named Proposal Processing Committee comprised of the persons experienced in technical and other issues related to the proposal.⁴⁹⁷ Actually, this committee is formed with top government officials from MoPEM and officials from national power and energy entities.⁴⁹⁸ This Act empowered the committee to conclude a contract by putting out short time newspaper notices, online advertisements even carrying on negotiations through email or letter. One of the non-transparent provisions of this Act is the circulation of tender, which is also allowed by private communication through email or letter with the concerned organisation.⁴⁹⁹ The Act also empowered the special committee to contract with interested parties in power and energy project, through private negotiation. Before presenting the proposal to the cabinet, the committee has all the authority to take any decision regarding the proposal and when the proposal is submitted to the cabinet and financial and government purchase committee of the cabinet for approval, the administrative division shall respond appropriately to implement the proposal. The validity of any act done or deemed to be done under this Act shall not be questioned before any court of law.⁵⁰⁰ No civil or criminal suit can be filed against any officer for any act done or deemed to be done in good faith under this Act.⁵⁰¹ The acts and proceedings taken under this Act shall be continued in a manner as the Act is in operation even after the duration has been expired.

This Act is known as the Indemnity Act to protect officials of the power and energy sector involved in signing contract without any tender.⁵⁰² Professor Anu Muhammad has compared this law with a shield to protect the corrupt officials and policymakers.⁵⁰³ After expiration of two years, it was extended for two years on September 2012, it was further extended for 4 years on August 2014 and finally it was extended for third time up to 2021. Experts of local energy industry have expressed their concern on such extensions as it can encourage corruption and discourage transparency in energy and power sector.⁵⁰⁴ Professor

⁴⁹⁶The Speedy supply of Power and Energy (Special Provision) Act 2010,s 1(2). Translated from Bangla by the researcher. <http://bdlaws.minlaw.gov.bd/act-1059.html> November 13, 2019.

⁴⁹⁷The Speedy supply of Power and Energy (Special Provision) Act 2010, s 5.

⁴⁹⁸Rahman, “Bangladesh Cabinet approves 4-year Extension of Special Law for Energy, Power Projects”

⁴⁹⁹The Speedy supply of Power and Energy (Special Provision) Act 2010, s 6(d).

⁵⁰⁰Ibid., s 9.

⁵⁰¹Ibid., s10.

⁵⁰² Energy Bangla, “Speedy Supply of Power and Energy Act, 4 Years Extension,” July 21, 2014.<https://energybangla.com/speedy-supply-power-energy-act-4-years-extension/> accessed on January 11, 2020.

⁵⁰³ibid.

⁵⁰⁴Rahman, “Bangladesh Cabinet approves 4-year Extension of Special Law for Energy, Power Projects”

M. Tamim is of the opinion that though in 2010 this Act was necessary to address the energy crisis, the country's existing power and energy situation is stable and does not permit further extension of this special Act.⁵⁰⁵ Following the Act, in 2012, Petrobangla entered into a contract with Russian company Gazprom for drilling 10 gas production wells in different fields, of which cost was 193.5 million USD.⁵⁰⁶ Former Director of power cell also expressed his concern and considered that the Act paved the way of corruption by passing tendering process.⁵⁰⁷ This law is considered in violation of the Constitution as the unfettered power conferred by this Act is being used against public interest.⁵⁰⁸ Number of experts opined to revoke the Act, as it may lead inefficiency of power sector.

3.3.10 The Gas Development Fund Policy 2012

The background of the policy states that the dependence on the IOCs is increasing to meet the rising demand of natural gas in Bangladesh. Strengthening the exploration and production activities is necessary to meet the demand, but that requires investment from other sources as the government allotment is not adequate.⁵⁰⁹ The price of gas is increased so that the exploration and production of gas through national oil company is accelerated. The Gas Development Fund was meant to increase financial incentives to BAPEX. In case of success, the company will repay the amount with 2% service charge within 10 years after the commencement of the project at six months interval in 14 installments, but in case of no success the amount will be treated as incentives.⁵¹⁰ It is also mentioned that if the project stops for any force measure, the decision about the remaining installment will be taken by the concerned ministry. The duration of this fund is ten years and after the expiration of this period the Government will decide about the fund and its management. This fund will be for exploration, production, development and transmission of natural gas. It is mentionable that the fund is not be utilised to purchase the car while this can be hired.⁵¹¹ There will be a project selection committee comprising one convener and other five members. After selection of the projects it will be forwarded to the chairman of Petrobangla with recommendation based on which the Petrobangla will made a list of the project and send them both to the

⁵⁰⁵Rahman, “Bangladesh Cabinet approves 4-year Extension of Special Law for Energy, Power Projects”

⁵⁰⁶Rahman, “Bangladesh Cabinet approves,” and Energy Bangla, “Speedy Supply of Power.”

⁵⁰⁷Ibid

⁵⁰⁸ “Thrust On Scrapping Unconstitutional Speedy Energy Supply Law,” *The Business Standard*, July 10, 2020, <https://tbsnews.net/bangladesh/energy/thrust-scrapping-unconstitutional-speedy-energy-supply-law-104563> accessed on October 3, 2020.

⁵⁰⁹ Gas Development Fund Policy 2012, Energy and Mineral Resources Division, Ministry of Power, Energy and Mineral Resources, The Peoples’ Republic of Bangladesh, pmb1, February 1 2012.

⁵¹⁰Ibid. art. 3(2), .

⁵¹¹ Ibid ., art 6.

ministry for approval, with a copy sent to the commission. In case of the projects to be run by the Gas Development Fund no liquidity certificate is necessary from the finance division of Bangladesh.⁵¹²

However, this policy was a very significant initiative of the Government to make the BAPEX self-sufficient and to strengthen their operational skill. It was the need of the hour to expand the exploration and production activities by the national oil company to preserve the interest of the country.

3.3.11 The Petroleum Act 2016

The Act is enacted with a view to making a more suitable law for import, transport, storage, production, refining, blending, or reclaiming by recycling, marketing and distribution of petroleum.⁵¹³ This Act repealed the Petroleum Act 1934. Though the Act is enacted almost after a century, it mainly addresses the downstream activities of the petroleum resources.

Analysis and consideration of the contemporary facts and context reveal that the policy, laws, regulations and institutions of the petroleum sector are not sufficient to ensure the sustainable development of natural gas resources. However, the enactment of such Speedy Transmission of Power and Energy (Special Provision) Act is a matter of great concern for proper management of this valuable sector.

3.4 INSTITUTIONAL STRUCTURE

The sustainable development of the petroleum resources depends on the effective control and supervision of this resources by establishing institution through numerous process. Institutions impose some obligations that are guided by legal, moral and cultural ambit of the society on the operator.⁵¹⁴ The institution is the outcome of formal law that combines the community activities, implements the policies and delivers service to attain the good governance in this sector.⁵¹⁵ Considering the role of the institution to attain the sustainable development, Padilla recognises the institutions as representatives or guardians to protect and respect the intergenerational rights.⁵¹⁶ Institutions are established under the legislation to implement the laws and policy.

Most of the petroleum exploiting countries that started their extraction activities during the second half of the 20th century conferred both their regulatory and the commercial

⁵¹² Gas Development Fund Policy 2012, art 8.

⁵¹³ The Petroleum Act 2016, pmb. Act No 32 of 2016. English translation is made by Author herself, no official English translation is available. <http://bdlaws.minlaw.gov.bd/act-1190.html> accessed July 18, 2018.

⁵¹⁴ Namuyondo, “*Sustainability and Oil Exploration*,” 31

⁵¹⁵ *Ibid.*, 35.

⁵¹⁶ Emilio Padilla, “Intergenerational Equity and Sustainability,” *Ecological Economics* 41 (2002): 69–83. cited in Namuyondo, “*Sustainability and Oil Exploration*”

function to a government organisation under a ministry which conduct their activities through state owned oil companies.⁵¹⁷ However, these national oil companies work as government representatives that perform their function with the assistance of the IOCs for exploration and development of the petroleum resources.⁵¹⁸ Bangladesh also started their extraction activities during the second half of the 20th century and its scenario is almost the same but difference is that the state owned companies act as the subsidiary of the regulatory institution established by law. The energy sector of Bangladesh is under the Ministry of Power, Energy and Mineral Resources (MoPEMR). Moreover, there are number of organisations involved to regulate the petroleum resources. The institutional structure to control and supervise the petroleum operation in Bangladesh is shown in Figure 3.2.

⁵¹⁷ James A Baker III Institute for Public Policy, “The Changing Role of National Oil Companies in International Energy Markets,” *Baker Institute Policy Report*, no. 35 (2007), 17; <http://www.bakerinstitute.org/research/baker-institute-policy-report-35-the-changing-role-of-national-oil-companies-in-international-energy> accessed on December 15, 2019 see also Al-Kasim, *Managing Petroleum Resources*, 174

⁵¹⁸ David G. Victor, David R. Hults and Mark C. Thurber, *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, (Cambridge: Cambridge University Press, 2011), 23.

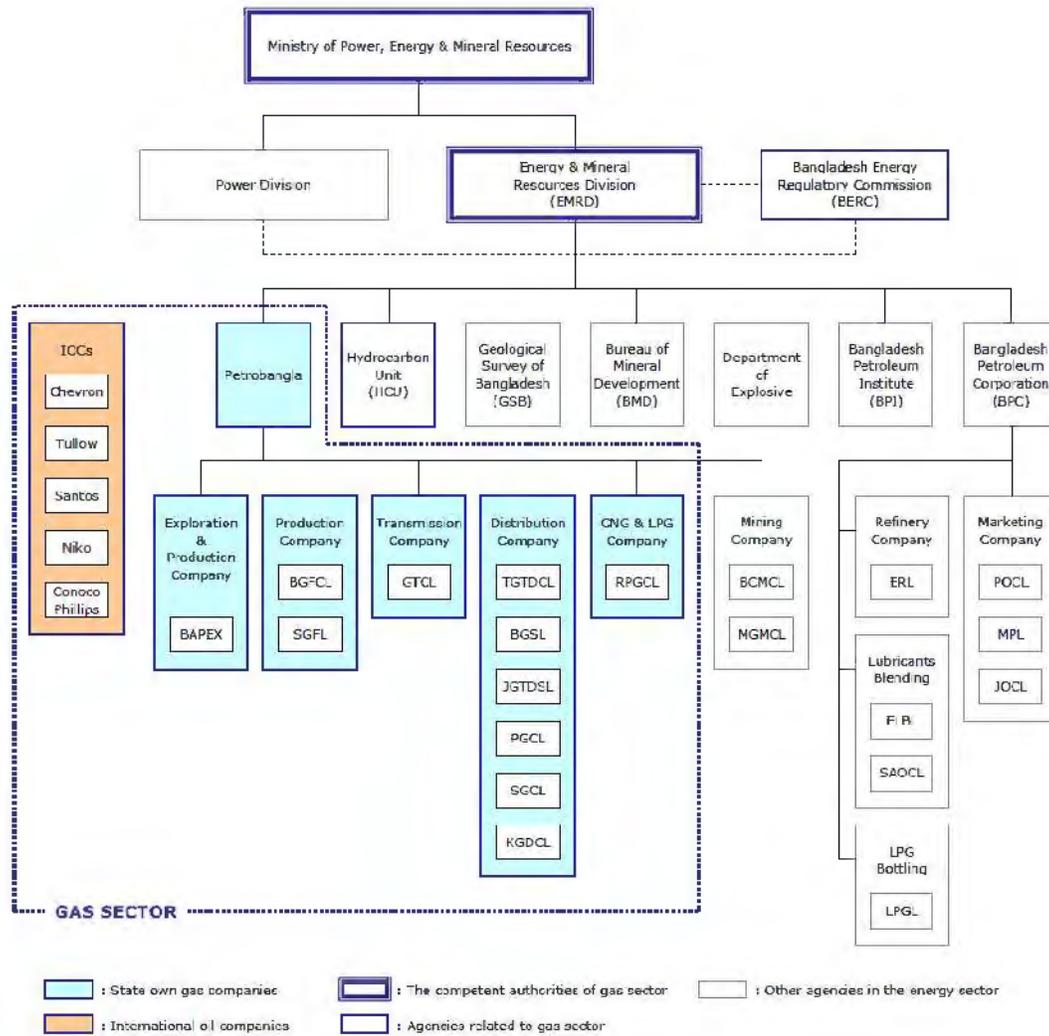


Figure 3.2 Organisational structure of energy sector in Bangladesh⁵¹⁹

3.4.1. Ministry of Power, Energy and Mineral Resources (MoPEMR)

The ministry of power, energy and mineral resources is divided into two divisions namely Power Division, and Energy and Mineral Resources Division. The Power Division is vested to the Bangladesh Energy Regulatory Commission (BERC) and the Energy and Mineral Division is vested to Energy and Mineral Resources Division (EMRD). The downstream regulation of energy and mineral resources is also vested on the BERC. Energy and Mineral resources division conducts its activities with the cooperation of a number of organisations such as the Petrobangla, Hydrocarbon Unit, Geological Survey of Bangladesh, Bureau of

⁵¹⁹Japan International Cooperation Agency (JICA), "Data Collection Survey on Bangladesh Natural Gas Sector," Ministry of Power, Energy and Mineral Resources, The People's Republic of Bangladesh, Final Report, (2012), 8. https://openjicareport.jica.go.jp/pdf/12066122_01.pdf accessed on April 19, 2018.

Mineral Development, Department of Explosive, Bangladesh Petroleum Institute and Bangladesh Petroleum Corporation.⁵²⁰ The functions of the ministry are i) to formulate the policy, Acts and Rules related to oil, natural gas, liquid petroleum products and mineral resources, and ii) to manage, administer and plan all the programmes related to geological survey, *i.e.* the administration and control of the Geological Survey of Bangladesh. The Bureau of Mineral Development, the Department of Explosives, the Bangladesh Petroleum Institute, Petrobangla, Hydrocarbon Unit and the Bangladesh Petroleum Corporation are also under the control of the ministry.⁵²¹

3.4.1.1 Hydrocarbon Unit

The unit started its journey in 1999 in a form of a project with a view to enhancing the technical expertise of the persons in the energy sector with the financial assistance of Norway.⁵²² Considering its importance, the Government of Bangladesh established the hydrocarbon unit as a permanent unit in 2008.⁵²³ The function of this unit is to provide the technical assistance to develop oil, gas and mineral resources of the Energy and Mineral Resources Division (EMRD). It also analyses the gas market and gas management in addition to assessment of gas reserve, production and consumption.⁵²⁴

3.4.1.2 Geological Survey of Bangladesh

This unit starts its journey with the name Geological Survey of India in 1851, set up by the then British Indian Government in the transitional periods during the British and Pakistan regimes. It restarted its function after the independence of Bangladesh in 1971.⁵²⁵ In 1972, this organisation was empowered to carry out the exploration activities for natural resources except oil and gas.⁵²⁶ Finally, it was established as a permanent department of EMRD in 1980.⁵²⁷

⁵²⁰JICA, "Data Collection Survey."

⁵²¹ Energy and Mineral Resources Division, "**Widening Women's Effective Access to General Public Sector Services and Income Generating Activities**," Gender Budgeting Report 2017-2018, ch 34.

⁵²²Bangladesh Hydrocarbon Unit, Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh <https://mpemr.gov.bd/power/details/53> accessed on May 6, 2018.

⁵²³Ibid.

⁵²⁴JICA, "Data Collection Survey."

⁵²⁵Geological Survey of Bangladesh, Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh <https://mpemr.gov.bd/power/details/25> accessed on May 6, 2018.

⁵²⁶Geological Survey of Bangladesh

⁵²⁷Ibid.

3.4.1.3 Bureau of Mineral Development

The bureau was established in 1962 under Industries and Mineral Division which is now working under EMRD of The Ministry of Power, Energy and Mineral Resources.⁵²⁸ This organisation is empowered to grant the license for exploration, mining and quarry leases for all kinds of mineral resources without oil and gas.⁵²⁹

3.4.1.4 Department of Explosive

This department works as a controlling authority of the commercial explosives, flammables and unfired pressure vessels.⁵³⁰ The function of this department is to manage the explosive substances.⁵³¹

3.4.1.5 Bangladesh Petroleum Institute

This institute was established in 1981 with a view to meeting the training of the persons of different organisations involved in exploration, production and distribution of oil, gas and mineral resources.⁵³² It is also responsible for research and development of oil, gas and mineral resources as well as the human resources of EMRD.⁵³³

3.4.1.6 Bangladesh Petroleum Corporation

This organisation was established in 1976 through the Bangladesh petroleum ordinance 1976. It started functioning in 1977.⁵³⁴ This corporation is mainly responsible for the downstream activities of the petroleum resources including the import, storage, marketing and distribution of the petroleum resources.⁵³⁵

3.4.1.7 Bangladesh Oil, Gas and Mineral Corporation (Petrobangla)

Bangladesh Minerals, Oil and Gas Corporation (BMOGC) was established in 1972 by the Presidential Order number 27.⁵³⁶ The operational activities of the corporation were separated in the same year by the Presidential Order number 120 and were vested to a new organisation

⁵²⁸Bureau of Mineral Development, Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh <https://mpemr.gov.bd/power/details/37> accessed May 6, 2018

⁵²⁹JICA, "Data Collection Survey"

⁵³⁰Department of Explosive, Ministry of Power, Energy and Mineral Resources, available at <https://mpemr.gov.bd/power/details/48> Accessed May 6 2018.

⁵³¹JICA, "Data Collection Survey,".

⁵³² Bangladesh petroleum institute, available at <http://www.energysector-bpi.org.bd/about-us.php> Accessed May 6 2018.

⁵³³JICA, "Data Collection Survey,".

⁵³⁴ Bangladesh Petroleum Corporation, available at <https://s3.amazonaws.com/rgi-documents/999714439f97eca614437265b549039665b25b53.pdf> Accessed May 9 2018.

⁵³⁵JICA, "Data Collection Survey,".

⁵³⁶ Bangladesh Oil Gas and Mineral Corporation , BD Yellow Pages, Online Business Directory, <http://bdyellowpages.net/description/BangladeshOilandGasMineralCorporation> accessed on May 6, 2018.

named Bangladesh Mineral Exploration and Development Corporation (BMDC).⁵³⁷ Then it was reconstituted as Bangladesh Oil and Gas Corporation (BOGC) through the Ordinance number 15 of 1974.⁵³⁸ The downstream functions of the petroleum resources including importation, refining and marketing were vested to a newly constructed institution “Bangladesh Petroleum Corporation (BPC)” through the Ordinance number 88 of 1976.⁵³⁹ In 1985, the BMEDC and BOGC were merged into a single entity as Bangladesh Oil, Gas and Mineral Corporation (BOGMC).⁵⁴⁰ The natural gas is under the heading of the Energy and Mineral Resources Division of MoPEMR which is vested on Petrobangla. The management and development of natural gas is under this organisation. Petrobangla conducts its activities with the help of some affiliated companies of which one is responsible for exploration and production, two for only production, one for transmission, six for distribution and one for CNG promotion.⁵⁴¹ There are two more companies to conduct the mining activities, *i.e.* to develop petroleum and other mineral resources, under the control and supervision of Petrobangla.⁵⁴² The upstream activities of natural gas in Bangladesh are conducted through three national companies under Petrobangla; these are Bangladesh Petroleum Exploration and Production Company Limited (BAPEX), Bangladesh Gas Fields Company Limited (BGFCL) and Sylhet Gas Fields Limited (SGFL)⁵⁴³. Among these three companies BAPEX is responsible for both the exploration and production and other two companies BGFCL and SGFL are responsible for production.⁵⁴⁴ At present twenty gas fields are under production out of which four gas fields are operated by IOCs, and these are Bibiyana, Jalalabad, Moulvibazar and Bangora Gas Fields. The first three fields are operated by Chevron and the last one is operated through Tullow/KrisEnergy.⁵⁴⁵ It represent that maximum gas fields are operated by Petrobangla’s affiliated companies which are responsible for the development of natural gas and oil in Bangladesh.

Under the production sharing contract, the national oil companies are working as operator as well as the subsidy of the regulator. There is no separation of power as Petrobangla serves

⁵³⁷ Bangladesh Oil, Gas and Mineral Corporation (Petrobangla), Ministry of Power, Energy and Mineral Resources, https://www.mpemr.gov.bd/public_service/details/4 accessed on March 11, 2017.

⁵³⁸ “A Study on Accounting Systems of Petrobangla” <https://lawaspect.com/study-accounting-systems-petrobangla/> accessed on December 11, 2018.

⁵³⁹ “A Study on Accounting Systems of Petrobangla”

⁵⁴⁰ Ibid.

⁵⁴¹ JICA, “Data Collection Survey,”

⁵⁴² Petrobangla, *Annual Report 2017* (Dhaka: Bangladesh Oil Gas and Mineral Corporation, 2018), 39.

⁵⁴³ Ibid.

⁵⁴⁴ Ibid.

⁵⁴⁵ Petrobangla, *Annual Report 2017*, 36.

commercial purpose and regulatory function at the same time. The fusion of regulatory and commercial function and their delegation to the same entity may be one of the significant barriers towards proper development of petroleum resources.⁵⁴⁶ In case of Bangladesh, Petrobangla negotiates with the IOCs and at the same time carry on their upstream and downstream activities through their affiliated companies and sometimes in cooperation with the IOCs. In this circumstance, it leads to some confusion to the IOCs.⁵⁴⁷ Whereas Norway, which is considered as a model country of petroleum exploitation in the world, ensures the separation of functions among the policy development, industry regulation and commercial operation. In this country, the administration of petroleum is imposed on three different bodies. The National Oil Company engages in commercial petroleum production, the responsibility of policy development lies on the Ministry of Petroleum and Energy, and the Norwegian Petroleum Directorate (NPD) works as a regulatory body.⁵⁴⁸ On the contrary, in Bangladesh the single body Petrobangla is working as a regulatory organisation and simultaneously it performs the exploration and production activities through some affiliated companies. If all the power to control petroleum operation is gathered to a single hand, there is a high susceptibility of collusion which is noticed in most of the developing countries.⁵⁴⁹ As the accountability of Petrobangla is not clear, there are some instances of mismanagement in this organisation, such as collusion between the international oil company and the public officials, corruption or bribery and lack of efficiency at different levels.⁵⁵⁰ As a result, the proper accountability of this organisation is not ensured and that leads to non-transparency, which is one of the criteria for sustainable development of natural gas operation. The state owned organisation like Petrobangla is also present in many other developing countries. In Vietnam the Petrovietnam (Vietnam Oil and Gas Corporation) plays the same role.⁵⁵¹ This system of self-regulatory institution may be beneficial in the early stages of petroleum development of a state but in the long run, it will be beneficial for the country to establish an independent upstream regulating organisation. In this case, the 35 years experience of Petrobangla should properly be taken into consideration. Self-regulation without having an independent regulatory organisation leads to conflict of interest, which may delay the

⁵⁴⁶ Victor, *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, 31.

⁵⁴⁷ Paulson Erot Tadeo, "A Comparative Study of Oil Resource Management in Norway and Nigeria: Lessons for Kenya," (Master Thesis, University of Nairobi, 2016), 50.

⁵⁴⁸ Douglas Tlogane Mailula, "Protection of Petroleum Resources in Africa: A Comparative analysis of Oil and Gas Laws of Selected African States," (PhD diss., University of South Africa, 2013),105

⁵⁴⁹ Gunter, "Mineral Extraction in Bangladesh"

⁵⁵⁰ Ibid.

⁵⁵¹ Gang Lu et al., *Gas Sector Master Plan 2017*, 226.

development of the petroleum sector of the country. The neighboring country India established the Directorate General of Hydrocarbon (DGH) as a technical arm of the concerned ministry having oversight on all contract. National oil companies are completely separated from this controlling authority. Therefore, no conflict of interest between the national oil company (NOC) and IOCs is raised.⁵⁵²

3.5 NATURAL GAS EXTRACTION AND LAWS ON SUSTAINABLE DEVELOPMENT OF BANGLADESH

The discussion on the regulatory framework of natural gas exploration and production (E&P) of Bangladesh reveals that it is regulated by a number of policies, laws and Model Production Sharing Contract (MPSC). The MPSCs are discussed in chapter four. Sustainable natural gas extraction depends on the sound regulatory framework addressing all the aspects relevant to gas operation. In Bangladesh, a number of laws and regulations with some direct or indirect connection to such petroleum activities are adopted from time to time. These are the Water Pollution Control Ordinance 1970, Environmental Pollution Control Ordinance 1977, National Environmental Policy 1992, National Environment Management Plan 1995, Bangladesh Environment Conservation Act (BECA) 1995, Bangladesh Environment Conservation Rules (BECR) 1997, Bangladesh Environment Court Act 2010 and National Environment Policy 2018. Among the numbers of laws the BECA 1995 and the ECR 1997 directly impose some obligations on the corporations, whether national or multinational, operating in the country. In Bangladesh, there are a number of departments involved in ensuring sustainable natural gas extraction, but the laws and regulations concerning the operation are not in an integrated form based on comprehensive approach. There are about 200 laws directly or indirectly related to environment,⁵⁵³ a number of which have to be taken into consideration by the petroleum industry during the operation. DoE is established to coordinate among the different laws that are applicable in different sectors. Petroleum sector is also governed by the same method and various environmental laws are also applied beyond the petroleum related laws and contract. To address petroleum operation there is no comprehensive law or regulation to address the petroleum sector of Bangladesh. This part of this chapter will examine the compliance of different environmental laws and policies that have to be considered in the natural gas operation.

⁵⁵²Gang Lu et al., *Gas Sector Master Plan 2017*, 235

⁵⁵³Faruque, *Environmental Law: Global and Bangladesh Context*, 253

3.5.1 The National Environment Policy 2018

The first environment policy of Bangladesh was formulated in 1992 following which the Bangladesh Environment Conservation Act was enacted in 1995 and the Environment Conservation Rules was formulated in 1997. Still now, these laws and rules are the prime instruments to govern all the environmental issues of Bangladesh. As the methods and extent of the environment pollution is changing considerably from 1992, it was the demand of time to revise the environment policy of 1992 to conserve the environment and ecology. To this end, Government of Bangladesh formulated a new policy titled National Environment Policy 2018. It is declared in the policy that the Government of Bangladesh is determined to protect and conserve the environment along with its economic development as the development of the mankind and the existence of flora and fauna depend on ensuring balance between the environment and sustainable use of natural resources.⁵⁵⁴ One of the reasons behind the formulation of this policy was the obligation of the state to implement the Paris treaty. The policy asserts its importance by stating that it will act as a combination of principles to protect and preserve the environment.⁵⁵⁵ Among twenty-two basic issues of considerations of this policy, one is to meet the demand of present and future generation, and another important one is that the protection of environment will be considered an inalienable part of every development initiatives.⁵⁵⁶ To this end, development activities will be carried on the principle of sustainable production and consumption.⁵⁵⁷ Some other issues of this are (i) carrying out the production and consumption of natural resources and protection of environment in a scientific manner (1.3); (ii) considering all possible hazards and environmental effects entailing the processes of accumulation and utilisation of natural resources (1.4); (iii) evaluation of the economical contributions of natural resources and ecosystem services under the National Development Plan (1.5); (iv) ensuring realisation of compensation from the polluting individuals/organisations with the enforcement of Polluter's Pay Principle (1.10); and (v) prioritising 'preventive measures' over 'curative measures' concerning environmental conservation (1.15).⁵⁵⁸ The policy outlined sixteen objectives, some of which are explicitly or implicitly related with petroleum operation, and they are,

- to find out all kinds of pollutants and destructive activities to the environment, ensure environment friendly development in all spheres,

⁵⁵⁴ National Environment Policy, 2018, Ministry of Environment, Forest and Climate Change, Government of the Peoples Republic of Bangladesh, pmb. (2018). Translated by the researcher.

⁵⁵⁵ Ibid.

⁵⁵⁶ Ibid.

⁵⁵⁷ Ibid.

⁵⁵⁸ Ibid., pmb.

- ensure sustainable, long term and environment friendly consumption of natural resources,
- ensure Environmental Impact Assessment and Strategic Environmental Impact Assessment, strengthen the monitoring programme to proper implementation of environmental laws and rules.

All these provisions of the policy are recommendable to ensure sustainable development of Bangladesh. Formulation of this policy was the urge of the time to improve the quality of the environment. The environment policy 1992 did not reflect on the issue of sustainable development adequately. The major Act to govern the environment of Bangladesh was enacted following that policy and a number of rules were adopted under the BECA 1995. A few Acts were enacted to address specific sectors like air, water, biodiversity, medical waste management etc. The NEP of 2018 specifies the sector-wise policy and almost all the aspects of environment pollution along with specifying the responsible authority to implement those policies are included in it. It comprises twenty areas that are directly or indirectly related with environment pollution including energy and mineral resources. It is recognised that the production and consumption of energy have some negative impact on the environment. It recommends a number of principles to extract the energy and mineral resources in a more environment friendly manner. These principles are related with upstream, midstream and downstream phases. More emphasis was given to the utility and conservation of energy and in developing energy sources other than the fossil fuel. It suggests that before commencing any project of energy and mineral resources extraction, it requires the assessment of environmental impact and the implementation of its mitigation process. It also requires that any negative impact on the local community and environment be compulsorily avoided and extraction of any energy, which is destructive to the environment have to be avoided.⁵⁵⁹ The policy also proposes to take initiatives to review the policy in every five years. There is also a provision to amend the existing laws in the light of international law, convention and protocol which Bangladesh has approved to implement the policy.⁵⁶⁰

This policy also prescribes the compliance method and emphasises the comprehensive approach of environmental development. It works both as principle and direction to other national policies related to environmental activities.⁵⁶¹ The implementation segment in energy and mineral part includes a number of issues. The only mechanism of compliance directly related with the petroleum operation is to take proper measures so that the extraction of energy in no way creates any negative impact on air, water, land, hydrological balance and

⁵⁵⁹ National Environment Policy, 2018, art. 3.16.

⁵⁶⁰ Ibid., art. 4.

⁵⁶¹ Ibid., art 6.

ecosystem.⁵⁶² Actually, it reflects the sustainable extraction of the petroleum resources. It requires a number of initiatives as the institutional capacity, amendment of existing law and enactment of integrated environmental law, human resources development, use of environment friendly technology, effective EIA and Social Impact Assessment (SIA) at all phases of operation and overall an effective monitoring. These ingredients are not properly accommodated in the existing applicable laws on petroleum operation in Bangladesh. The present environmental law that is applicable to the issue of environment pollution needs to be updated based on an integrated approach. At present, the EIA is conducted according to Environment Conservation Rules 1997. However it does not define, whether all the red category industries have to comply with the same requirement, or there is any sector based EIA procedure that is followed in accordance with the nature of the project. Though Strategic environment assessment is emphasised in this policy, it is not clearly defined. In Bangladesh, this policy is the first one that ensures the cost benefit analysis of any economic development along with its environmental degradation. Suggesting to consider the net development by evaluating the economic development and environmental harm, this policy brings the environmental consideration in the mainstream of economic development.

This Environment Policy is a striking instrument, which focuses on full-fledged sustainable development. The implementation of this policy requires the enactment of new petroleum laws or amending the existing laws in the light of the policy guidelines. However, until now initiatives are yet to take in this regard.

3.5.2 The Bangladesh Environment Conservation Act 1995

This Act was enacted for the purpose of conservation of the environment, improvement of the environmental standards, and control and mitigation of environmental pollution.⁵⁶³ To fulfill the purposes of this Act the Department of Environment (DoE) is established and Director General (DG) is appointed in this department by the Government who is responsible for coordination among the various agencies related with the objectives of this Act. The DG is also responsible for preventing the accidents that may cause environmental degradation and pollution, taking safety measures, finding out remedial measures, and issuing direction regarding the accidents.⁵⁶⁴ The DoE also gives advice or issue a direction to the concerned persons regarding environmentally sound use of hazardous substances, collects and publishes

⁵⁶² National Environment Policy, 2018, art. 3.16.7.

⁵⁶³ The Bangladesh Environment Conservation Act 1995, Act No. 1 of 1995, Government of the Peoples Republic of Bangladesh, 153. <http://bdlaws.minlaw.gov.bd/act-791.html> accessed on January 12, 2018.

⁵⁶⁴ The Bangladesh Environment Conservation Act 1995, ss 3 and 4.

information on environmental pollution, and advises Government to avoid such manufacturing process, commodities and substances that cause environmental pollution. Moreover, if the DG considers that particular environmental pollution is likely to cause danger to the public life, then s/he may issue direction in this regard specifying time limit to carry on the direction.⁵⁶⁵ The DG is also empowered to ascertain the compensation, direct the liable person to take corrective measures or pay the compensation or take both, if it appears to DG that the act or omission of the person is causing or have caused direct or indirect injury to the ecosystem, persons or group of persons.⁵⁶⁶ If the directed person fails to comply with the above provision, the DG may file suit for compensation and criminal case for violation of the provision in the competent court under section 7 of this Act. This is a striking provision of this Act, as for the first time in Bangladesh the environmental crime, which is applicable both for individual and corporation, is recognised. Penalty, both the fine and imprisonment, is prescribed in section 15 for the violation or non-compliance with the direction of the DG. However, if the violator is the company then only fine may be imposed according to the provision of section 16(2) of this Act. This Act incorporates all the provisions to make accountable the company or corporation operating in the country.

However, application of such glorious provision is not found in essence. Devastating blowouts happened in Magurchara in 1997 and in Tengretila in 2005, but no initiative has not been taken by the DoE for violating the provisions of this Act. Occidental, the operating company liable for the Magurchara blowout, did not obtain the Environment Clearance Certificate (ECC). They applied for ECC and the DoE prescribed some terms and conditions to fulfill in order to obtain the ECC. Still it started its operation without obtaining the ECC and the DoE was silent about this.⁵⁶⁷ Though section 7 clearly states that failure to comply with the provision of this Act is a crime and both civil suits for compensation and criminal case for non-compliance can be filed. Nevertheless, no case was filed by the DoE either for compensation or for the corporate environmental crime. It is evident from the above mentioned fact that without ensuring proper mechanism, the legislative effort is meaningless. In the case of Tengratila blowout, the role of the DoE was the same. Its role to realise the compensation was not noticeable.

⁵⁶⁵The Bangladesh Environment Conservation Act 1995, ss 4(3) and (4).

⁵⁶⁶*Ibid.*, s 7.

⁵⁶⁷Zakia Afrin, "Foreign Direct Investments and Sustainable Development in the Least-Developed Countries," *Annual Survey of International & Comparative Law* 10, no.1, (2004). <http://digitalcommons.law.ggu.edu/annlsurvey/vol10/iss1/9> accessed March 19, 2019.

The provision of the public hearing is inserted but subject to the application of the person who is affected or likely to be affected by the pollution of the environment. The provision of hearing after receiving the application is a barrier to serve the actual purpose of this Act. Public hearing should be conducted before the initiation of any project without any requirement of application. That can be effective to attain the purpose of this Act. If by accident or for any unforeseen situation, the environmental pollutant discharge exceeds the limit prescribed by the Rules, remedial measures to control and mitigate the pollution should be taken by the liable person. This is the polluter pays principle of international environmental law. The liable person immediately informs DoE about the accident and the DoE takes necessary measures to control and mitigate the pollution. All the expenses are payable by the polluter and in instance of failure, the amount is recoverable as the public demand. Regrettably, application of this provision by the DoE is not found in case of the two massive blowouts of Bangladesh.

Provision of ECC is inserted in section 12 of this Act, which states that without obtaining the ECC from DoE no industrial unit or project can be undertaken or established. Under section 15A, the DG may file suit for compensation for any injury suffered by public due to violation of the provision of this Act or Rule made under this Act. Section 17 of this Act incorporates a provision that bars an individual to claim damage without the written approval of the inspector of the DoE. But if the court is satisfied that the inspector or any person authorised in this behalf did not take any initiatives within 60 days after receiving the complaint from the person, then the court may directly take the cognisance of the claim.⁵⁶⁸ In Gulf of Mexico hundreds of suits were filed against the liable company by national body, local body and individuals but in Bangladesh the inclusion of such provision of written approval from the inspector of the DoE causes difficulty to the innocent people suffering from the environmental harm to take the shelter of law. Though provision of individual suit is permitted but it depends on the satisfaction of the court.

Here the difficulty is that at first the person has to make a complain, then after 60 days if the inspector or the authorised person does not take an action, then the court may directly take the cognisance after giving an opportunity of hearing to the authority. Here the term ‘may’ is used instead of ‘shall’. As when it is proved that after filling the complaint the proper authority has failed to perform their duty, there is no provision to make them liable due to failure to discharge their legal responsibility. Further, the discretion is provided to the

⁵⁶⁸The Bangladesh Environment Conservation Act 1995, s 17.

court whether it takes the cognisance of the suit or not. These are some provisions that may hinder the proper implementation of this Act to make the environment polluter responsible.

3.5.3 The Environment Conservation Rules (ECR) 1997

In 1997, the Government made this Rule under section 20 of the Bangladesh Environment Conservation Act (BECA) 1995. In clause 5 of the Rules it is stated that if any person applies to DG under section 8 of the BECA 1995, the DG shall dispose the matter within 60 days. This Rules divides the industrial unit in 4 categories based on their impact on the environment.⁵⁶⁹ In the ECR (1997), the mining activities including exploration and extraction are considered under the ‘Red’ category that indicates the worst environmental effect.⁵⁷⁰ In case of a red category project or industry, Location Clearance Certificate (LCC) and Environment Clearance Certificate (ECC) from the DG of the DoE are prerequisites.⁵⁷¹ However, the requirement of LCC depends on the discretion of the DG. A Guide to Environment Clearance Certificate (ECC), issued by the DoE under the Ministry of Environment and Forest (MoEF), clearly specifies that LCC is mandatory for any industry of red category and the ECC is issued after the approval of the Environmental Impact Assessment (EIA) report. In such cases, the DG issues an ECC within 60 days. Then the industrial unit undertakes the EIA based on the IEE (Initial Environmental Examination) and submits to the DG with other documents required under this Rule and the DG issues an ECC within 30 days.⁵⁷² However, in 2010, the Ministry of Environment and Forest published ‘A Guide to Environmental Clearance Procedure’ which specifies five steps in the process of obtaining ECC. These are (i) submission of application with supporting documents, (ii) verification of those documents by DoE, (iii) inspection of those documents by an authorised officer, (iv) conducting a meeting of the Environment Clearance Committee, and (v) taking the decision.⁵⁷³ Although the meeting of the environment clearance committee is referred to in the guide, the formation of the committee is not mentioned in either the BECA of 1995 or the ECR of 1997. Another provision is added about/regarding inspection of application and

⁵⁶⁹ The Environment Conservation Rules 1997, Ministry of Environment and Forest, Government of the People’s Republic of Bangladesh, cl. 7 (1997). <https://www.elaw.org/system/files/Bangladesh+-+Environmental+Conservation+Rules,+1997.pdf> accessed on February 16, 2019. For the purpose of granting the ECC the industrial unit or project are divided in four categories these are Green, Orange A, Orange B and Red.

⁵⁷⁰ *Ibid.*, s 1.

⁵⁷¹ *Ibid.*, rule 7(4).

⁵⁷² Department of Environment, “to Environmental Clearance Procedure,” Ministry of Environment and Forests, Government of the People’s Republic of Bangladesh (2010). <http://doe.portal.gov.bd/sites/default/files> accessed on January 7, 2020.

⁵⁷³ Department of Environment, “A Guide to Environment”.

documents, after verification by the authorised officer but who the authorised officer will be is not prescribed. The total discretion is left to the DG of the DoE, and that may pave the way of non-transparency.

India issued the Environmental Impact Assessment Notification 2006 under which, like in Bangladesh, projects on oil and gas are classified under ‘Red’ category. In India, before commencing any activities on oil and gas project, some clearances from the relevant departments are the prerequisites of the operation.⁵⁷⁴ These are:

- (i) Environmental Clearance issued by the Ministry of Environment and Forest (MoEF) after conducting proper screening, scoping, public consultation and EIA with the recommendation of the Expert Appraisal Committee,
- (ii) Forest clearance from the Principal Chief Conservator of Forest (PCCF) approved by the Regional Chief Conservator of Forest (RCCF). The application for this clearance is to be submitted to the Divisional Forest Officer, who along with the Range Forest Officer, will visit the site, scrutinise and process the application, submit a report in this regard to the Conservator of the Forest. The CF will forward it to the CCF, and thereafter it is submitted to the PCCF who recommends it to the RCCF for formal approval of the clearance. The demarcation of areas and the removal of trees are conducted by the divisional forest officer.⁵⁷⁵
- (iii) Consent to Establish from the State Pollution Control Board (SPCB) before commencing the construction activities, it is mandatory to have according to the Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981.
- (iv) Consent to Operate from SPCB. The application is to be submitted with relevant documents and evaluation report of environment management system proposed by Consent to Establish. The Consent to Operate is granted for a certain period subject to renewal.
- (v) Authorisation of hazardous waste from the SPCB specifying elaborately the collecting, handling, transporting and disposal process under the

⁵⁷⁴Pulak Das, “Environmental Management in Oil and Gas Upstream Industry in India,” *Journal of Industrial Pollution Control*, 30(1) (2014): 59-66 available at <http://www.icontrolpollution.com/articles/environmental-management-in-oil-and-gas-upstreamindustry-in-india-.php?aid=45300> accessed on January 9, 2020.

⁵⁷⁵Ibid.

Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2008 of India.⁵⁷⁶

However, the most significant aspect of this notification is the submission of compliance report by the company to the MoEF, SPCB, and Central Pollution Control Board (CPCB) by the industry every sixth month and the data of air, water and noise quality on a monthly basis to SPCB under the requirement of ECC. Moreover, the company is also required to submit a yearly statement on environment to MOEF, SPCB CPCB and monthly compliance reports to the SPCB.⁵⁷⁷ It is noticed here that the coordination among the several departments related to the petroleum operation is prescribed and compliances are also followed up.

The Bangladesh Environment Conservation Act 1995 defines the term environment as “the inter-relationship existing between water, air, soil and physical property and their relationship with human beings, other animals, plants and micro-organisms”.⁵⁷⁸ It is evident that, the protection of environment does not depend only on the BECA 1995 but on a number of laws related to air, water, soil, and their relation with human, animal, plant and micro-organism indicating the biodiversity and ecology. Therefore, the “environment pollutants mean any solid, liquid or gaseous substance that cause harmful effect to the environment and they also include heat, sound and radiation”.⁵⁷⁹ It indicates that the companies or individuals have to comply to other laws related to the protection of air, water, soil, sound, radiation and biodiversity to fulfill the purpose of this Act. Whenever any company or petroleum industry intends to conduct any operation, they have to comply with the domestic environmental legislation though specifically all the laws are not mentioned in the contract. The responsibility of coordination is imposed on DG to ensure that the person or the company has to comply with other laws relevant to their project. The model production sharing contracts also specify that the contractor has to conduct the IEE, EIA and Environment Management Plan (EMP) according to the provisions of the BECA 1995 and ECR 1997.⁵⁸⁰ However, to conduct an environment friendly operation, the company also has to take into consideration the other related domestic laws of Bangladesh.

⁵⁷⁶Das, “Environmental Management in Oil and Gas,” 59-66

⁵⁷⁷Ibid

⁵⁷⁸The Bangladesh Environment Conservation Act 1995, s 2, clause d.

⁵⁷⁹Ibid., s 2, clause e .

⁵⁸⁰Model Product Sharing Contract 2008, art 10.23.

3.5.4 The Water Management Laws

The petroleum operation needs a huge amount of water in their reservoir. These water ultimately turn up on the surface of the earth as waste water.⁵⁸¹ Water is also used as a lubricant and coolant in drilling machines. During the production stage, most of the wastes are produced as contaminated water containing inorganic salt, heavy metals, production chemicals and occasionally Naturally Occurring Radioactive Materials.⁵⁸² Therefore, the accidental oil spills or gas blowout leads to huge underground water contamination.⁵⁸³

There are a number of laws and policies in respect of water management in Bangladesh, such as the Water Pollution Ordinance 1970, which was repealed by the Environment Pollution Control Ordinance 1977. At present, the water pollution of Bangladesh is controlled by the Bangladesh Environment Conservation Act 1995 and the Bangladesh Environment Conservation Rules 1997. The BECA 1995 repealed the Environment Pollution Control Ordinance of 1977. The Government of Bangladesh has adopted the National Water Policy in 1999 with a view to protecting the environment and ensuring sustainable development, because numerous instances of environmental degradation are related with water pollution. The objectives of this policy are efficient water management to ensure available water to all elements of the society, separating institutions for water resources with a view to decentralising of water resources management and a legal and legislative change for sound environmental management and improving the investment climate for the improvement of water development and management by private sectors.⁵⁸⁴ The policy incorporates the provision of participation of mass people and stakeholders in the management of water resources.⁵⁸⁵ Provisions regarding industrial water pollution are also included, defining principle to comply by the industries. For example, the effluents discharge standard in watercourse will be defined by the Water Resources Planning Organisation (WARPO) in consultation with the DoE, and a periodical monitoring system will be available by proper authority. In case of any water pollution beyond the acceptable standard, the polluter pays principle will be applicable.⁵⁸⁶ The policy suggests forming a separate regulatory institution, National Water Resource Council (NWRC), to co-ordinate the various

⁵⁸¹Namuyondo, “*Sustainability and Oil Exploration*”.

⁵⁸²Isaiah K. Okuthe, “Environmental and Social Challenges of Oil and Gas Exploration in Kenya,” *International Journal of Innovation and Scientific Research* 17, no. 1 (August 2015): 164-174.

⁵⁸³Weaver, “Sustainable Development in the Petroleum Sector,” 17.

⁵⁸⁴National Water Policy, Ministry of Water Resources, Government of the People’s Republic of Bangladesh, art. 3 (1999).

⁵⁸⁵*Ibid.*, art. 4.16.

⁵⁸⁶*Ibid.*, art. 4.8.

activities of water management and a National Water Code with facilitating the implementation provision.

Following this policy, a Water Act is passed in Bangladesh in 2013. The Act contains a number of provisions regarding water management in Bangladesh. A National Water Resources Council (NWRC) is constituted comprising 34 members including a number of ministers and secretaries from different ministries along with expert personnel from the field of water management.⁵⁸⁷ This council is responsible “to make policies, and give instructions for integrated development of, proper use of, safe abstraction of, proper distribution of, proper protection of, and proper conservation of water resources.”⁵⁸⁸ The functions of this council are well articulated. Provisions also include formulating new water policy through public hearing and on the opinion of the communities and organisations. However, responsibility of implementing the policy and strategies adopted by the council and the executive committee is imposed on the DG of WARPO. The executive committee of this council is comprised of 23 members from the council. The executive committee is responsible for the publication, monitoring and evaluation of the national water policy and national water resource plan. The provision of issuing compliance order by executive committee is inserted here and when any authority who is not an individual does not comply with the compliance order or violate the provision of ECC issued by the DG, the executive committee recommends the council to take judicial action against the authority after certain formalities.⁵⁸⁹ Sec 14 of this Act incorporates the provision of co-ordination between the DG and the council constituted under this Act. This Act is very significant, as it comprises many aspects of water resources management. However, no separate regulatory institution concerning water resources management is established under the Act from which the petroleum industry will receive some comprehensive guidelines regarding water pollution and compliance during the operation. Moreover, though the policy suggests a comprehensive code regarding water management, the Act is not a comprehensive one, because a number of other laws are also involved in management of water. The composition of the National Water Resources Council and the executive committee includes the representatives from a number of ministries, however neither the Minister nor the Secretary of the Ministry of Power, Energy and Mineral Resources are included though it is evident that the activities of this

⁵⁸⁷The Bangladesh Water Act 2013, s 4(1). Act No. 14 of 2013 Government of the People’s Republic of Bangladesh. <http://bdlaws.minlaw.gov.bd/act-1114.html> accessed on February 15, 2019.

⁵⁸⁸The Bangladesh Water Act 2013, s 5(a).

⁵⁸⁹Ibid., s 12.

ministry are directly related with surface and underground water pollution of the country. Another matter of significance is that before commencing any project regarding the making, undertaking and implementing the water resources development plan, all organisations or appropriate authorities or local Government institutions require to obtain an ECC from the executive council. Beyond water resources development plan, provision of such ECC is not a requirement for commencing any other project including petroleum operation. This Act also does not permit any individual to file suit for the pollution of water against any authority or persons.⁵⁹⁰ Whereas, in India, the consent of the Department of Establishment is mandatory according to the Water (Prevention and Control of Pollution) Act, 1974, before commencing the petroleum operation. India has also prepared Good International Petroleum Industry Practice(GIPIP) by the Ministry of Petroleum and Natural Gas where it is clearly stated that the source of water for fracturing should be determined and approved by the local authority as it requires comparatively fresh water because the effectiveness of fluid additives is decreased by salt and contaminant water.⁵⁹¹ The best practices guided by the GIPIP about the surfaced wastewater are to route them to the evaporation pond, inject into the disposal well, or treat them to meet the standard to dispose in surface water or offshore. Among these methods the best one is chosen according the context of operation whether it in onshore or offshore.⁵⁹² In Bangladesh, the responsibility of preventing water pollution is to be regulated according to BECA 1995. Therefore, though provision is made for the imprisonment and compensation for violation of the direction issued under this Act, no provision of polluter pays principle is included as per Water Policy of 1999. The natural gas is the main source of energy of Bangladesh and a significant amount of wastewater is produced by the petroleum industry but no specific guideline is included addressing this sector. However, the MPSC of Bangladesh accommodates the provision for prevention of pollution of water from the discharge of petroleum wastage.⁵⁹³ In Bangladesh there are a very few laws governing water resource management while their implementation is not effective because of poor institutional measures and lack of proper governance, and ill-defined responsibilities of the institutions responsible for prevention of water pollution.⁵⁹⁴

⁵⁹⁰ The Bangladesh Water Act 2013, s 36.

⁵⁹¹ Good International Petroleum Industry Practices (GIPIP), Directorate General of Hydrocarbons, Ministry of Petroleum and Natural Gas, Government of India (2016), 253.
http://petroleum.nic.in/sites/default/files/GIPIP_Final_approved.pdf accessed on December 11, 2019.

⁵⁹² Ibid.

⁵⁹³ Onshore Production Sharing Contract 2019, art. 10.24.

⁵⁹⁴ Faruque, *Environmental Law: Global and Bangladesh Context*, 295

3.5.5 Waste Management System

The environment is significantly affected due to discharge of huge amount of petroleum-derived hazardous waste like oily and toxic sludge.⁵⁹⁵ There is no provision of environment friendly waste management system neither in the Petroleum Act 1974 nor in the MPSC of Bangladesh. Industrial waste is one of the major sources of environment pollution but there is no separate law regulating the industrial waste management in Bangladesh, though there is a separate law for the treatment of the medical waste in Bangladesh.⁵⁹⁶ This large sector of industrial effluent treatment plan is regulated by the BECA 1995. Considering the importance of industrial waste, the National Environmental Management Action Plan, 1995 (NEMAP) finds out a number of environmental problems relating to waste. These are (a) pollution at various levels of environment generating from industries, (b) almost no measure to control or minimise the pollution from waste, (c) high cost of waste management due to backdated technology instead of available modern technology and (d) no initiative and support from the Government for sound effluent management plan.⁵⁹⁷ All these problems are also evident in the petroleum industry of Bangladesh. Still now, the Government has not formulated any policy, Rule, or regulation regarding the waste management of this sector.

A survey was conducted by the DoE during 2002 to 2005 and it is found that among 524 industrial units of red category, 417 industries established their Effluent Treatment Plan (ETP) by their own initiatives and 105 industries have no ETP at all.⁵⁹⁸ According to the ECR 1997, the petroleum industry is under the red category and it discharges huge amount of wastages during the drilling of the wells. Two types of wastages, drilling fluids (mud) and drillings cuttings are discharged. Veil⁵⁹⁹ pointed a number of options for onshore petroleum waste management such as “land spreading and land farming, evaporation and burial onsite, underground injection, incineration and other thermal treatment, bioremediation and composting and reuse and recycling.”

⁵⁹⁵Iteet. al, “Petroleum Exploration and Production: Past and Present Environmental Issues in the Nigeria’s Niger Delta.” *American Journal of Environmental Protection* 1(4) 2013: 78-90.doi: 10.12691/env-1-4-2.

⁵⁹⁶ In Bangladesh “The Medical Waste (Management and Processing) Rules 2008” was formulated by the Ministry of Environment and Forest, Government of the People’s Republic of Bangladesh under article 20 of The Bangladesh Environment Conservation Act 1995.

⁵⁹⁷National Environmental Management Action Plan, Ministry of Environment and Forest, Government of the People’s Republic of Bangladesh (1995).

⁵⁹⁸Farjana Nasrin, “Waste Management in Bangladesh: Current Situation and Suggestions for Action,” *International Research Journal of Social Sciences* 5, no.10 (2016): 36-42.

⁵⁹⁹ John A Veil, “Drilling Waste Management: Past, Present, and Future,” *SPE Annual Technical Conference and Exhibition*, Society of Petroleum Engineers, 29 September-2 October, 2002, San Antonio, Texas.

In Bangladesh, no industrial waste management rule or regulation exists that can be followed by the petroleum industry to carry out the operations. The only instrument is the BECA 1995 and the Rule made there under, and the only authority to ensure and justify the environmental compliance is the DG of the department of environment whose accountability is not defined.

3.5.6 Noise Pollution Control Mechanism

There is a close relation between noise pollution and industrial development.⁶⁰⁰ Petroleum industries are responsible for various noise pollution also. In petroleum operation, there are four phases causing noise pollution. These are drilling, hydraulic fracturing, completion, and production stages where noise level exceeds the standard permissible limit.⁶⁰¹ Natural gas operation too is involved with various types of noise and vibration during the drilling and extraction. Some of the major sources responsible for continuous noise generation are the turbines, turbo-generators, compressors, pumps, fans, coal handling plant etc.⁶⁰² It is reported that some of the probable consequences of the noise pollution from the petroleum operation are death, reduced growth, impaired hearing and stress.⁶⁰³ There is no provision in the BECA 1995 addressing the noise pollution though section 20 of this Act empowered the Government to make rules on any environmental ingredients. However, subsection 2 of the same section mentions some of the areas for rule making but nowhere in the Act noise pollution is addressed.⁶⁰⁴ Considering its significance, the Government has made a Rule in 2006 titled as Noise Pollution (Control) Rules 2006. This Rules prescribes the acceptable standard of noise in the industrial area. Radtke *et al.*⁶⁰⁵ find out that during drilling, hydraulic fracturing and production period the noise level exceeds the acceptable standard and go up to 80 dBA,⁶⁰⁶ whereas, the Rules prescribe the standard of noise in industrial area as 75 decibel and 70 decibel at day and night respectively.⁶⁰⁷ However, no effective control mechanism is provided by this Rules to comply with the standards prescribed by this Rules. The Rules

⁶⁰⁰ Adamu Saleh Saidu, Piyush, Tomar and Mohammed Sagir Saleh, "Study on the Effect of Noise Pollution in the Oil and Gas Industry," *International Journal for Advanced Biological Science* 7, no. 4, (2017): 813—816.

⁶⁰¹ Cameron Radtke et al., "Noise Characterization of Oil and Gas Operations," *Journal Occupational and Environmental Hygiene* 14, (2017): 659-66.

⁶⁰² Final Report on Environmental Impact Assessment (EIA) of Bibiyana 300- 450 MW Gas based Combined Cycle Power Plant to be Constructed at the Location of Nabiganj, Habiganj, Government of the People's Republic of Bangladesh, Ministry of Power, Energy & Mineral Resources, Power Division Bangladesh Power Development Board (BPDB) (February, 2013), 59.

⁶⁰³ Okuthe, "Environmental and Social Challenges," 164-174

⁶⁰⁴ The Bangladesh Environment Conservation Act 1995.

⁶⁰⁵ Cameron Radtke et al., "Noise Characterization of Oil and Gas Operations," 659-66

⁶⁰⁶ A-weighted decibel used for measuring relative loudness in air

⁶⁰⁷ Noise Pollution (Control) Rule 2006, Ministry of Environment and Forest, Government of the People's Republic of Bangladesh, sch. 1 (2006).

prescribes imprisonment for one month and up to five thousands taka fine as punishment of violating the provision of this Rules for the first time and for the repeated violator the punishment is imprisonment for 6 months and fine up to 10 thousands taka. The stipulated punishment is very nominal. Noise pollution in the natural gas operation can be reduced by implementing some advanced technology such as sound barriers or by diverting the sound wave trajectories. Another very simple way to control the noise is to reduce it from its sources.⁶⁰⁸

3.5.7 Air Pollution in Petroleum Industry

Another very significant aspect of the petroleum operation is air pollution. Air emission associated with the petroleum operation significantly affects the air quality and weakens the visibility.⁶⁰⁹ The reason of such kind of pollution is mixing up of Hydrogen and Carbon, unburned hydrocarbons, Carbon Monoxide, fly ash, Nitrogen Oxides, and sulfur oxides with the Oxygen in air.⁶¹⁰ Gas flaring, venting and purging of gases, combustion of engine, emission from burning sources of well testing and soil disturbance during the construction are some of the vital contributors in derogating air quality.⁶¹¹ It is also a very crucial aspect of industrialisation, including petroleum operation. In addition to legal instrument, the use of realistic and affordable technology may reduce and to some extent eliminate the emission and improve the overall situation.⁶¹²

However, there is no separate law to address the air pollution in Bangladesh. At present, it is maintained under the BECA 1995. An initiative has been taken by the Government in 2018 for drafting the Clean Air Act.⁶¹³ Following that, a draft of Clean Air Act is drafted in 2019 and till now the draft is not enacted as law. At present, such an important sector is controlled under a very general Act, the BECA 1995. The purpose of the draft Act is to mitigate and control air pollution through vigorous control and encouraging clean technology and production process in order to ensure the ambient air quality and sustainable development, public health and life and the right of clean air of the citizens.⁶¹⁴ The implementation and explanation of this draft Act will be directed through the

⁶⁰⁸Pollution Control Technologies for the Oil & Gas Sector.<https://shipandshore.com/pollution-control-technologies-oil-gas-sector/> accessed on December 11, 2019.

⁶⁰⁹EPA, "An Assessment of the Environmental Implications of Oil and Gas Production: A Regional Case Study," Environmental Protection Agency, Working Draft (September, 2008).
<https://archive.epa.gov/sectors/web/pdf/oil-gas-report.pdf> accessed December 20, 2018.

⁶¹⁰Pollution Control Technologies for the Oil & Gas Sector

⁶¹¹Okuthe, "Environmental and Social Challenges," 164-174.

⁶¹²"Pollution Control Technologies for the Oil & Gas Sector"

⁶¹³Aiman R. Khan, "We're all at Risk," *The Dhaka Tribune*, March 15, 2019.

⁶¹⁴Draft Clean Air Act 2019, pmbl. (2019), Translated by the researcher.

precautionary principle of sustainable development and polluter pays principle.⁶¹⁵ The Government shall prepare a list of air pollutants to attain the objectives of this Act and to ensure a complete air pollution management and controlling system; and within one year after enactment, the Government will determine the standards, methods, processes and indicators of air pollutants through promulgation of the official gazette. The Government also has to determine the coordination system among concerned departments and distribute responsibility for implementing this Act.⁶¹⁶ The provision of this Act and Rules prescribed under this Act shall be consistent with the international conventions, protocol and treaties relating to air to which Bangladesh has the obligations.⁶¹⁷ To this end, the Government will define the national emission standards of performance for stationary sources for various industries,⁶¹⁸ but the petroleum industry is not included though this industry is also responsible for emitting wastes in air at different stages of operation. However, it states about national standard of energy and its infrastructures. It is actually not clear whether it indicates the exploration and production period of energy like petroleum resources or not. The law should be clearer in this regard considering its negative impact on the air quality of concerned area. For the management of national standard of air quality various provisions are included in the plan as controlling air pollution, strategic management, institutional infrastructure, sustainable financial support and research on air pollution to find out its impacts. These are some of the very contemporary provisions to protect the air quality. The plan also defines the time limit to implement those initiatives and the plan will be reviewed every five years.⁶¹⁹ However, the draft is not enacted as law still now to address such an important environmental aspect though the air quality of Bangladesh is degrading day by day.

If examples from different countries are considered, it is seen that Norway considers the environment and climate change issues as the integral part of their petroleum policy.⁶²⁰ In this respect to control the emission in the air during the petroleum operation a number of legal instruments such as, the Carbon Tax Act, Greenhouse Gas Emission Trading Act 2005 along with the Petroleum Act, the CO₂ Tax Act on Petroleum Activities, the Sales Tax Act are adopted by them. In fact, Norway is the first country in the world, which levied tax on

⁶¹⁵Draft Clean Air Act 2019s 3. Translated by the researcher

⁶¹⁶ Ibid., s 5.

⁶¹⁷ Ibid., s 4(2).

⁶¹⁸ Ibid., s 5 (3)(a)

⁶¹⁹ Ibid., s 6.

⁶²⁰“Pollution Control Technologies for the Oil & Gas Sector,” *Ship and Shore Environmental Inc.* <https://shipandshore.com/pollution-control-technologies-oil-gas-sector/> accessed March 07, 2018.

Carbon emission in 1991. Moreover, in 2007, Norway introduced a tax on Oxides of Nitrogen emissions to encourage cost-effective emission cuts.

3.5.8 Conservation of Biodiversity

All species of plants, animals, microorganisms and the ecosystem including ecological process are parts of biodiversity.⁶²¹ Exploration and production activities of petroleum have significant impacts on biodiversity, as the operation involves surveying, clearing of seismic lines and extensive use of dynamites for geological excavation.⁶²² The biodiversity is affected by all the phases of the petroleum operation, as the habitats are disturbed from such kind of operations, and that leads to negative impact on wild life and change the feeding, nesting, breeding, predator protection patterns and migration routes. Though, the environmental assessment and impact is evaluated, the output is not published publicly and national Government rarely takes any rigorous protocol to control the negative impact on the biodiversity.⁶²³ A number of international instruments are directly related to the conservation of biodiversity, such as the Convention on the Protection of the World Cultural and Natural Heritage 1972, Convention on International Trade on Endanger Species of Wild Fauna and Flora (CITES) 1973, Convention on the Conservation of Migratory Species of the Wild Animals (CMS) 1979 and the Convention on Biological Diversity (CBD) adopted in Rio De Janeiro, in the United Nations Conference on Environment and Development in 1992. The preamble of the CBD assures the sustainable use of biodiversity to ensure its potential to meet the needs of present and future generation. The objectives of this convention, stated in article 1, are to conserve the biological diversity, sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilisation of genetic resources. That can be achieved ensuring appropriate access to genetic resources and appropriate transfer of relevant technologies, taking into account all rights over those resources, technologies and appropriate funding.⁶²⁴

Bangladesh is a signatory of this convention and ratified it in 1992. Under article 6 of this convention, the state parties are under an obligation to develop and update their national strategies, plan, programmes to reflect the measures set in this convention for the purpose of conservation and sustainable use of biological diversity. To fulfill this obligation, Bangladesh

⁶²¹Faruque, *Environmental Law: Global and Bangladesh Context*, 78.

⁶²² Collins N C Ugochukwu and Jürgen Ertel, "Negative Impacts of Oil Exploration on Biodiversity Management in the Niger Delta Area of Nigeria," *Impact Assessment and Project Appraisal*, 26, no.2 (June 2008): 139–147. <http://www.ingentaconnect.com/content/beechn/iapa> accessed on December 12, 2019.

⁶²³ Jessica L. Deichmanna et al. "Sound scape Analysis and Acoustic Monitoring Document Impacts of Natural Gas Exploration on Biodiversity in a Tropical Forest," *Ecological Indicators* 74 (2017): 39–48.

⁶²⁴Faruque, *Environmental Law: Global and Bangladesh Context*, 78

has adopted the National Biodiversity Strategy and Action Plan (NBSAP) 2004. The NBSAP recognises that in Bangladesh biodiversity is the key to livelihood of a large part of population as they completely depend on natural resources.⁶²⁵ The major objectives of the NBSAP are to:

- conserve, and restore the biodiversity of the country for wellbeing of the present and future generations;
- ensure that long-term food, water, health and nutritional securities of the people are met through conservation of biological diversity;
- maintain and improve environmental stability for ecosystems;
- ensure preservation of the unique biological heritage of the nation for the benefit of the present and future generations;
- guarantee the safe passage and conservation of globally endangered migratory species, especially birds and mammals in the country; and
- stop introduction of invasive alien species, genetically modified organisms and living modified organisms.

To fulfill these objectives, NBSAP outlines 16 strategies that will be implemented on short term, medium term and long term basis. All of these 16 strategies are focused on sustainable management, conservation, and restoration of biodiversity for current and future generations. The implementation of the strategies will be conducted under the coordination of the Ministry of Environment and Forest along with other relevant ministries, division, government agencies, institutions, non-government organisations, academic institutions, and communities. It is also acknowledged that there are lack of communication and proper coordination, and the responsibilities of the relevant departments are not properly defined.⁶²⁶

This instrument has found out some of the root causes for the loss of biodiversity. These are over exploitation of resources, deforestation, polluted water and priority of development over biodiversity conservation.⁶²⁷ All of these are directly related to extraction of natural gas. Another significant finding of this NBSAP is the long-standing focus on production in expense of conservation and sustainable management.⁶²⁸ This document is called the “living document” as it is responsive, flexible and practical with the changing circumstances and there is a provision incorporated for revision of this instrument on a regular interval of six years.⁶²⁹ In this instrument, the Government outlines sixteen policy guidelines to ensure the conservation and sustainable use of biodiversity, where the strategy

⁶²⁵ National Biodiversity Strategy and Action Plan for Bangladesh, Ministry of Environment and Forests, Government of the People’s Republic of Bangladesh , (August 2004), v
<https://drive.google.com/file/d/0B6XjGVIRbmt0aUIBTGYyeEhGZmc/view> accessed on October 13, 2019.

⁶²⁶ *Ibid.*, 23.

⁶²⁷ *Ibid.*, 4.

⁶²⁸ *Ibid.*, v.

⁶²⁹ *Ibid.*, vii.

will be implemented in short term (0-3years), medium term (4-7 years), and long term (8-10 years). Though in strategy 2, the short-term implementation indicators include the provision for integrating the biodiversity concern in the EIA and SEA(Social Environment Assessment) process, it is not clear how far it is included in the IEE, EIA and SEA process of the natural gas operation. Another significant medium term action plan for the implementation of the strategy 6 of the NBSAP is to strengthen existing capacity of Department of Environment to address the Environmental Clearance Certificate more efficiently. Strategy 6 indicates that the DoE is not equipped enough to address ECC. It is not pragmatic to include this strategy in the medium term action plan, because without self sufficiency of the DoE, implementation of the attempt to protect the environment may not be possible due to the responsibility of coordination among the several departments being imposed on the DoE. A long time has passed after the adoption of the National Biodiversity Strategy and Action Plan in 2004. It is now time to evaluate whether the DoE is strong enough to implement the biodiversity strategy to issue the ECC. This document is focused on the participatory method for implementing the action plan and ensuring proper co-ordination among the different departments including stakeholders. As it is a living instrument, attention is paid to the periodical review. The instrument is very important for the conservation of national biodiversity of Bangladesh but the integration of these strategies and action plan with the policy of the concerned department responsible for the protection of environment is the urge of time. The natural gas operation has a negative impact on the environment and the biodiversity concern may be duly considered during granting ECC by the DoE.

The Bangladesh Biodiversity Act was enacted in 2017. Considering the importance of the conservation of biodiversity, the Act comprises a number of issues of which most important is the involvement of the local authority and the community with traditional knowledge to find out the impact of any project or activity on biodiversity and to make those informed and consult to their superior authority. To this end a National Committee of Biodiversity, City Corporation Biodiversity Management and Supervision Committee, District Biodiversity Management and Supervision Committee, Pourashova Biodiversity Management and Supervision Committee, Upazila Biodiversity Management and Supervision Committee, Union Biodiversity Management Committee will be constituted under this Act, and they will be empowered to form necessary committees at the grass root

level.⁶³⁰ This is very significant, as the local communities are well aware of the biodiversity of the concerned area. Therefore, if any change takes place on the biodiversity, they will notice it first. Actually, if this Act is implemented properly, then it will be very effective to implement the community consultation and involvement of local community in decision making. The Act also has inserted the provision of technical committee by the concerned ministry of any project to evaluate the impact and to act under the instruction of national committee.⁶³¹ In case of petroleum operation, if it negatively affects the biodiversity then to measure the actual impact these communities will play very significant role to present the real scenario of the field and surroundings. This Act enables the Government to distribute the responsibility among the government and non-government organisations for protecting the biodiversity. The Act also ensures the punishment in case of non-compliance with the provision of this Act or Rules formulated under this Act. If any organisation is liable for violation, then the decision maker also is subject to punishment.⁶³²

3.5.9 The Wetland Management System of Bangladesh

The Ramsar Convention (1971), defined wetlands as – “Areas of marsh, fen, peat land, or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters.”⁶³³ In Bangladesh, 50% of the land surface is occupied by the wetlands.⁶³⁴ The natural gas operation has some negative impacts on the wetlands too. The petroleum operation requires explosion of dynamite in aquatic environments that results in narcotic effects and mortality of fish and other faunal organisms.⁶³⁵ Though the wetland of Bangladesh is significantly affected by natural gas operation, no specific law or policy is adopted to address this crucial environmental ingredient. Moreover, the term wetland is not used in BECA 1995 as it is simply categorised under environmentally critical areas.⁶³⁶ The

⁶³⁰ Bangladesh Biodiversity Act, 2017, Act No. 2 of 2017 Government of the People’s Republic of Bangladesh, ss 8,13, 16, 19, 22, 25, 28. <http://bdlaws.minlaw.gov.bd/act-1203.html> accessed on November 25, 2019.

⁶³¹ Bangladesh Biodiversity Act, 2017, s 11.

⁶³² *Ibid.*, s 47.

⁶³³ International Conference on the Wetlands and Waterfowl, Ramsar, Iran, February 2, 1971, art 1. available at https://www.ramsar.org/sites/default/files/documents/library/original_1971_convention_e.pdf

⁶³⁴ Mizanur Rahman Bhuiyan, “Wetland Management in Bangladesh,” *Nature Study Society of Bangladesh* (2013). available at <http://www.naturestudysociety.org/wetland-management-in-bangladesh/> accessed on January 14, 2020.

⁶³⁵ Ugochukwu and Ertel, “Negative Impacts of Oil Exploration on Management in the Niger Delta Area of Nigeria,” 139–147..

⁶³⁶ Tahmina Haq, “A Violent Threat to Conservation of Wetlands and The Existing Laws of Bangladesh: A Critical Analysis,” *Philosophy and Progress: 53-54* (January-June, July-December, 2013): 113-126.

NBSAP 2004, has included strategy 10 to protect the wetlands of Bangladesh, and it recognises that the maximum ecosystem of the country is wetland which is under threat and requires community based wetland and aquatic resource management system.⁶³⁷ Bangladesh has ratified the Ramsar Convention of 1971, therefore, it is under the obligation to preserve the wetland according to this convention. In water management system it is not addressed separately to make a balance between human needs and wetland conservation, though a community based approach is taken by the Government which is not adequate to protect the degradation of the wetland.⁶³⁸ A comprehensive policy should be introduced to protect the wetland, which should be followed by the petroleum industry during the operation to conduct it in a sustainable way.

3.5.10 Soil Pollution Management

In petroleum operation, land is the ultimate sink of various solid petroleum wastes and hydrocarbon contamination in land is a matter of global concern.⁶³⁹ Petroleum operation is associated with the land contamination in a number of ways, especially in the development and production stages. A significant amount of hydrocarbon is dumped on agricultural land.⁶⁴⁰ Numerous disturbances occur on the land resources in various ways including construction, deforestation, contamination, discharge of solid waste, oil and gas spill etc.⁶⁴¹ The oil and gas spills contaminate the soil, destroy the crops and reduce the fertility cultivable land.⁶⁴² If controlling measures are not adopted, the compactness of soil is lost and erosion results in reshaping the land with loss of its visual beauty dramatically.⁶⁴³

There is no comprehensive law to regulate the natural gas exploration and production in Bangladesh. There is a numbers of laws directly or indirectly related to the operation of this resource and lack of coordination concerning this issue is common among several departments. Most of the oil and gas producing countries follow the complex and uncoordinated pattern of legislation to regulate this sector⁶⁴⁴ and Bangladesh is no exception.

3.6 CONCLUSION

For the betterment of Bangladesh, proper management of natural gas is a dire need, and it depends on sound policy and legal and institutional framework. Therefore, a number of

⁶³⁷ National Biodiversity Strategy and Action Plan for Bangladesh, 57

⁶³⁸ M. Shamsur Rahman, "Wetlands: Nature's Boon for Bangladesh," *The Independent*, February 24, 2019.

⁶³⁹ Ite et.al, "Petroleum Exploration and Production," 78-90.

⁶⁴⁰ Ibid.

⁶⁴¹ Okuthe, "Environmental and Social Challenges," 164-174.

⁶⁴² Ibid.

⁶⁴³ Weaver, "Sustainable Development in the Petroleum Sector," 17.

⁶⁴⁴ Ibid.

instruments have been adopted from time to time to foster the exploration and production of the petroleum resources as well as the natural gas in Bangladesh. However review of the existing policies, and legal and institutional frameworks of Bangladesh, it reveals that the existing laws, policy and institutional frameworks are not adequate to ensure sustainable development of petroleum resources. The policy is very significant to accelerate exploration and production activities and attain the sustainable development of the petroleum resources since it identifies the goal of the Government and the methods and principles to achieve that goal leading to the enactment of new legislation.⁶⁴⁵ However, in Bangladesh there is only one independent petroleum policy formulated in 1993, and after that, no independent policy is formulated though the energy policy is revised, incorporating a part as petroleum policy. Changing circumstances and facts urge for updating the existing petroleum policy.

The study identifies a number of loopholes in the Bangladesh Petroleum Act 1974, the only governing law in case of upstream petroleum operation. It also reveals that the provision of accountability and transparency of the authorised institution is unclear. Absence of any stipulation for the sustainable petroleum operation may be due to the fact that the very concept was in a developing stage during the enactment of the Bangladesh Petroleum Act 1974. However, there is a lack of effort to incorporate sustainable development through amendments. The Petroleum Policy 1993 and the Energy Policy of 2004 suggest enactment of new law and amendment of existing laws to implement the provisions of these policies. However, these suggestions are also yet to be implemented. The Rules under the Bangladesh Petroleum Act may be promulgated for detailing the rights and duties of the Government, Petrobangla and the operating companies.

The National Environment Policy 2018 focuses on the sustainable development and all the existing laws need to be amended according to this policy.

The power and responsibility of Petrobangla should be decentralised to ensure the transparency and accountability of this institution. Norwegian petroleum model, where the policymaking authority is vested on the concerned Ministry, Norwegian Petroleum Directorate works as regulator and the national oil company works as an independent entity, may be followed to overcome this issue. The State has to develop such a policy and regulatory framework that makes it possible to integrate the petroleum operation in a balanced and sustainable manner along with its economic development. The effective

⁶⁴⁵ ETU, “The Policy and Law Making Process,” Education and Training for Democracy & Development. <https://www.etu.org.za/toolbox/docs/govern/policy.html> accessed on July 10, 2019.

sustainable upstream operation of natural gas depends on harmonising policies, laws and institutional framework. Scrutiny of the legal, regulatory and institutional frameworks related to oil and natural gas reveals that the relevant elements are in scattered form. There is a need for a better and well organised legal and institutional framework to reap sustainable benefit from petroleum resources.

There should be clear policy objectives to ensure sustainable development in the exploration and production of natural gas in Bangladesh, following which the legislative and institutional framework will be developed. Finally, a model production sharing contract will be formulated, guided by the policy and law, and the institution will implement the MPSC and make the actual contract with the petroleum producing companies.

As the sustainable extraction of natural gas does not depend only on the petroleum-related laws and regulation, some other laws also have to be taken into consideration in a proper co-ordinated way, the lack of which is shown in the above discussion. This situation can be overcome through enactment of a comprehensive law regarding the petroleum operation in Bangladesh. Moreover, the enactment of laws like the Speedy Power and Energy Transmission (Special Provision) Act 2010, may not be encouraged to ensure a transparent and accountable management of the natural gas sector.

CHAPTER FOUR

MODEL PRODUCTION SHARING CONTRACT: A CASE STUDY OF BANGLADESH

The aim of this chapter is to present different types of contractual agreement in the petroleum sector, to critically analyse the MPSCs of Bangladesh and to represent comparison between MPSC and actual contracts.

4.1 INTRODUCTION

Due to the lack of experts and technical support as well as financial capability, the petroleum producing countries throughout the world have to seek the assistance of the International Oil Companies (IOC).⁶⁴⁶ To reap the benefit of petroleum resources, negotiation of the right contract is crucial. In this regard, the Government has three options. Firstly, it can create a national company for exploration and production which is done by Iran, Oman, Saudi Arabia, Mexico and Venezuela. Secondly, it can invite private investment which is followed in Canada, United States, United Kingdom and Russia. Thirdly, it can use a combination of the above two systems.⁶⁴⁷ Whether there will be a regulatory authority to enforce economic, environmental, health and other standards is to be determined by the terms of the contract.⁶⁴⁸ The parameters of investment are established through the contract for ensuring maximum benefit from the extraction of its petroleum resources⁶⁴⁹ and the petroleum-rich developing countries face a challenge to negotiate with the major oil companies as the Government wants to protect the public interest. The terms and conditions of any contract involving a huge investment are not published and it may lead to corruption. Therefore, the scope of corruption increases when government officials become the regulator.⁶⁵⁰ There are mainly three types of agreements or contracts between the state and oil-producing companies. These are the concession, production sharing contract and service contract. In addition to these, another two

⁶⁴⁶Douglas Tlogane Mailula, “*Protection of Petroleum Resources in Africa: A Comparative Analysis of Oil and Gas Laws of Selected African States*,” (Phd Thesis, University of South Africa, 2013), 74.

⁶⁴⁷Jenik Radon, “The ABCs of Petroleum Contracts: License-Concession Agreements, Joint Ventures, and Production-sharing Agreements,” in *Covering Oil: A Report Guide to Energy and Development* eds. S. Tsalik and A. Schiffrin (Open Society, 2005) available at <https://www.gmec-ee.com/wp-content/uploads/2013/08/The-ABCs-of-Petroleum-Contracts....pdf>. accessed on November, 1 2018.

⁶⁴⁸ Radon, *The ABCs of Petroleum Contracts*.

⁶⁴⁹ John J. Beardsworth and Mathew.A., “StuartPetroleum Legislative Frameworks and Contracts in a Federation: Issues for Constitutions, Petroleum Laws, Regulations, and Contracts,” 2019, https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1384-9_ch3 accessed on July 24, 2020.

⁶⁵⁰Radon, *The ABCs of Petroleum Contracts*.

types of agreement or contract, *i.e.* joint venture and hybrid system, are derived from the main three categories.⁶⁵¹ The contracts are associated with a high level of uncertainty,⁶⁵² and they require very skilled handling to find out a reasonable balance to protect the interest of both the company and the state.⁶⁵³ However, all types of the contract have some positive and negative sides, and the country has to choose the right contract considering its socio-economic condition.

4.1.1 Concession

Among the petroleum agreements, the concession system is the most primitive one. This type of agreement was introduced in 1901 in the Middle East by granting a concession to an Englishman named William Knox D’Arcy by the then Persian government for a period of six decades subject to the entitlement of the Government’s bonus at only 16% of Arcy’s profit.⁶⁵⁴ However, the earlier concession system was very much IOC’s interest friendly and detrimental to the interest of the host country.⁶⁵⁵ At present, the concession system refers to a permission granted by a host country to a national or international oil company for exploration and production of petroleum in condition of payment of cash or produced oil or gas and sometimes the combination of both.⁶⁵⁶ In a concessionary system, the IOCs control all the aspects of the exploration and production under the condition of payment of nominal royalty to the host government, and the Government has very little to interfere in their operation.⁶⁵⁷ In the beginning, concession agreements were granted for a very long term, but gradually it has been reduced to 15 years with the condition of extension.⁶⁵⁸ In modern concession system, the host government approving the concession supervises the budget, work programme and development plan.⁶⁵⁹

⁶⁵¹Faruque, *Petroleum Contract*, 8

⁶⁵²Uncertainty is raised because the success rate is on average one of ten drillings and depends upon on how much reserve in the field and the market price. For more details please see Jenik Radon, *The ABCs of Petroleum Contracts: License-Concession Agreements, Joint Ventures, and Production-sharing Agreements*.

⁶⁵³Radon, *The ABCs of Petroleum Contracts*.

⁶⁵⁴Cattan H, *The Evolution of Oil Concessions in the Middle East and North Africa*, *Parker School of Foreign and Comparative Law*. 1967 p 1.cited in Douglas Tlogane Mailula *Protection of Petroleum Resources in Africa: A Comparative Analysis of Oil and Gas Laws of Selected African States*, Phd Thesis, 2013, p 70.

⁶⁵⁵Mailula, “*Protection of Petroleum Resources in Africa*,” 69.

⁶⁵⁶*Ibid.*

⁶⁵⁷Faruque, *Petroleum Contract*, 8.

⁶⁵⁸*Ibid.*

⁶⁵⁹Mailula, “*Protection of Petroleum Resources in Africa*,” 73.

4.1.2 Production Sharing Contract

Production Sharing Contract (PSC) is essentially a process to involve the national or international private organisations in the upstream activities of the petroleum resources.⁶⁶⁰ Indonesia is the pioneer of the production sharing contract in the world, and it was introduced in 1966 in the agricultural sector to share the agricultural crops.⁶⁶¹ The emergence of the doctrine of permanent sovereignty over natural resources introduced the modification of the traditional concession system, and the production sharing contract or agreement appeared as a new way to make an agreement with the oil-producing companies.⁶⁶² In this contract, three elements, i.e. the cost recovery, profit oil or gas, and tax are essential. In a PSC, the produced petroleum is divided as a part of cost recovery and profit. The profit petroleum is shared between the host government and the operating company. All the risk and the cost are borne by the operating companies, and the cost is only recoverable after the production. In such cases, the payment is made to the owner of the resources (host government) after the successful production.⁶⁶³

At present, PSC is the most familiar petroleum agreement among the developing countries; however, there is no uniform model of it. That is why it varies from country to country.⁶⁶⁴ It is more acceptable than the concession system of agreement, as in this agreement, the host country exercises its authority over the exploration and production cycle. Therefore, it is preferable not only to the host country but also to the operating companies because of its flexible nature; and the contract itself regulates the operation period of the petroleum.⁶⁶⁵ PSC is popular throughout the world especially in the developing countries because petroleum operation is highly risky and on an average, 9 out of 10 explorations are unsuccessful. The operating companies recover their cost only after a successful production under full control and management of the host country.⁶⁶⁶ Moreover, it requires a huge amount of investment. National oil companies and Government now take about 80% of the

⁶⁶⁰ Adnan Al Wahid and Nadia Rawshan, "Exploration Activities in Bangladesh Gas," *BRAC University Journal*, 1, no.1 (2004): 33-40.

⁶⁶¹ Gustavson Associates, "Monitoring and Supervision Procedures for Exploration and Development Activities – Final Report," Hydrocarbon Unit, Energy and Mineral Resources Division, Government of the People's Republic of Bangladesh, (May 6, 2011), 10.

⁶⁶² Faruque, *Petroleum Contract*, 8.

⁶⁶³ Production Sharing Agreements: Theory and Practical Applications, *Kazakhstan International Business Magazine* No. 3,(2003). www.investkz.com accessed on January 9, 2019.

⁶⁶⁴ Taverne B, *An Introduction to the Regulation of the Petroleum Industry: Laws, Contracts and Conventions*, (Kluwer Law International, 1994).

⁶⁶⁵ Faruque, *Petroleum Contract*, 11.

⁶⁶⁶ Kiluange Tiny, The JDZ Model PSC: A Legal Analysis, *JuriSTEP*, August 2005 . Available at <https://resourcegovernance.org/sites/default/files/JDZ%20model%20K.pdf> accessed on October 10, 2020.

profits from oil and gas production, leaving 20% for the private MNCs (Multi-National Corporation).⁶⁶⁷ With the growing popularity of the production sharing contract, a number of developing countries have adopted the Model Production Sharing Contract (MPSC). Unfortunately, these MPSCs are substantially changed or sometimes ignored during the negotiation of an actual contract.⁶⁶⁸

4.1.3 Service Contract

In this type of agreement, the host country pays the operating companies for their exploration and production activities either in the form of cash or product.⁶⁶⁹ The sole ownership of petroleum, whether produced or *in situ*, is retained by the host state. The service contracts are of two kinds, risk service contract and pure service contract. In the former case all the risks associated with the exploration and production are carried out by the operating company and it is compensated after a successful production, and in the latter case all the risks are borne by the host state, and the activities of the company are hired by fee either fixed or variable under circumstances.⁶⁷⁰

4.1.4 Joint Venture

In a joint venture agreement, generally, more than one company jointly conduct their exploration, and production activities and the risk and output are distributed among them proportionately.⁶⁷¹ At present, the joint venture represents the involvement of the national oil company with a foreign one, in the upstream operation of the petroleum activities with the condition of rational risk and benefit distribution.⁶⁷² Most of the oil and gas producing countries now prefer the joint venture to develop their expertise and capacity.

4.2 CONTRACTUAL AGREEMENT IN BANGLADESH

Bangladesh inherited the concession system from Pakistan after independence.⁶⁷³ After the independence of Bangladesh, the Government of Bangladesh and Petrobangla negotiated with the IOCs for the exploration and production of natural gas. Petrobangla enjoyed some discretionary authority to negotiate without any specific guidelines.⁶⁷⁴ Considering the

⁶⁶⁷Weaver, "Sustainable Development in the Petroleum Sector," 45-77.

⁶⁶⁸ Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector," 15-20, 39-40.

⁶⁶⁹Mailula, "*Protection of Petroleum Resources in Africa*," 76.

⁶⁷⁰Faruque, *Petroleum Contract*, 11.

⁶⁷¹Kiluange Tiny, *The JDZ Model PSC*, .

⁶⁷²Mailula, "*Protection of Petroleum Resources in Africa*," 77.

⁶⁷³ Gustavson Associates, "Monitoring and Supervision Procedures".

⁶⁷⁴ The World Bank, "Performance Audit Report," People's Republic of Bangladesh Petroleum Exploration Promotion Project, Report No. 12114 (June 30, 1993).<http://documents1.worldbank.org/curated/en/394831468914755654/pdf/12114-PPAR-REVISED-PUBLIC.pdf> accessed on May 10, 2019.

necessity of the guidelines to conduct the agreement, several exercises were held, and two legal consultants were hired to prepare a model contract. The International Development Association (IDA) also amended the draft contract. Finally, the then energy ministry and the cabinets approved it.⁶⁷⁵ Therefore, the first model PSC of Bangladesh was adopted in 1988, which acted as a guideline to Petrobangla regarding negotiation.

Petrobangla is authorised to conduct petroleum agreements with any national or international oil companies for the purpose of any petroleum operation. Onshore and offshore areas of Bangladesh are divided into several blocks to facilitate negotiation with the companies. The old block map is shown in Figure 4.1.⁶⁷⁶ The first bidding for near offshore blocks was held in 1974. Bidding was limited to near offshore areas and six of the then seven offshore blocks were awarded to six different IOCs. The IOCs conducted gravity, magnetic and marine seismic surveys in 31,069 line kilometre areas, drilled 7 wells and discovered the Kutubdia Gas Field in 1977.⁶⁷⁷

The first bidding under model PSC was in 1993, and 8 blocks were awarded to 4 companies. Occidental was awarded three onshore blocks (blocks 12, 13 and 14). Later, Occidental transferred them to Unocal and Unocal transferred them to Chevron which is producing gas from Bibiyana, Jalalabad and Moulvibazar. Cairn Energy of UK was awarded one onshore block (block 15) and one offshore block (block 16). Cairn Energy discovered Sangu gas field in 1996 which produced gas until 2013. Blocks 15 and 16 have now been relinquished, except for the ring-fenced offshore Magnama structure which was transferred to Santos.⁶⁷⁸ Oakland-Rexwood was awarded two offshore blocks (blocks 17 and 18), and United Meridian Corporation was awarded onshore block 22. These blocks were relinquished later.⁶⁷⁹

⁶⁷⁵The World Bank, "Performance Audit Report".

⁶⁷⁶ Petrobangla, "Annual Report 2013," Bangladesh Oil, Gas and Mineral Corporation (BOGMC) (2014).

⁶⁷⁷ Petrobangla, "Annual Report 2015".

⁶⁷⁸ Petrobangla, "Annual Report 2015".

⁶⁷⁹Ibid.

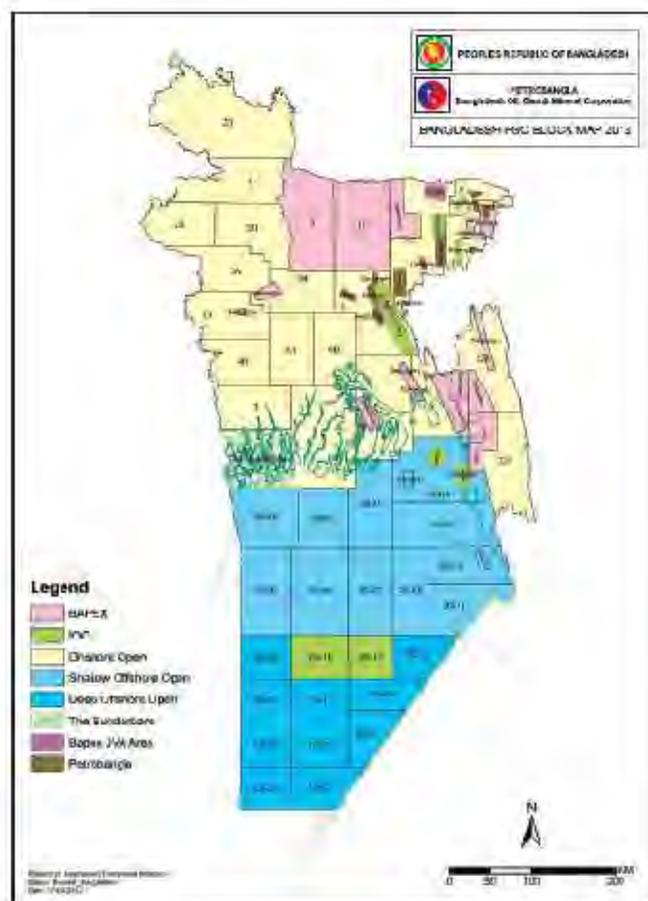


Figure 4.1 PSC block map of Bangladesh⁶⁸⁰

Bangladesh adopted another Model Production Sharing Contract after the formulation of the National Energy Policy in 1995. Under this PSC, Bangladesh was divided into 23 exploration blocks. The first bidding under this PSC was in 1997, and the provision for a mandatory 10% carried interest⁶⁸¹ for BAPEX was ensured during this bidding round. Four blocks (Blocks 5, 7, 9 and 10) were awarded in joint venture contract with BAPEX. As a result, Bangura Gas Field was discovered.⁶⁸²

In 2008, there was another bidding round which was limited to newly formed deep-sea blocks. Bidding of 2008 was hampered due to the maritime dispute with Myanmar. ConocoPhillips was awarded two blocks, DS-10 and DS-11. ConocoPhillips conducted 5,750

⁶⁸⁰Petrobangla, “Annual Report 2013”.

⁶⁸¹ Carried interest is a method where the state has option to participate in the E&P activities without taking the risk of failure from the exploration and appraisal well. The state receives the equity interest if there is commercially viable discovery. See also Peter A. Nolan & Mark C. Thurber, “On the State's Choice of Oil Company: Risk Management and the Frontier of the Petroleum Industry,” in *Oil and Governance: State-Owned Enterprises and the World Energy Supply* D. Victor, D. Hulst, & M. Thurber (Eds.), (Cambridge: Cambridge University Press, 2010), 121-170.

⁶⁸²Petrobangla, “Annual Report 2015”.

lkm (line kilometer) of 2D seismic survey in 2012 and 2013. ConocoPhillips relinquished the blocks in 2014 without drilling any exploratory well though there were few prospects identified.⁶⁸³ After the bidding round in 2008, Bangladesh sought the International Tribunal's opinion for the Law of the Sea (ITLOS) and got the verdict in March 2012. Petrobangla reshaped the blocks after the delimitation of the maritime boundary between Bangladesh and Myanmar. The revised block map is shown in Figure 4.2.

The Bangladesh Offshore Bidding Round 2012 was announced in December 2012 and 3 shallow water PSCs was signed with ONGC Videsh, Oil India & BAPEX for blocks SS-04 and SS-09 and Santos, Kris Energy and BAPEX for block SS-11. No PSC was signed for any deep-sea block under this bidding round though three proposals were received for blocks DS-12, DS-16 and DS-21. However, there was some negotiation with the Norwegian oil exploration company Stat-Oil.⁶⁸⁴ The summary of these bidding rounds is shown in Table 4.1.⁶⁸⁵

Bangladesh has modified its model PSC especially to attract foreign investment. Several PSCs have been signed, and all of the onshore PSCs have matured from the exploration phase to the production phase and major areas of the blocks have been relinquished.⁶⁸⁶ However, Chevron is producing gas in blocks 12, 13 and 14 with Bibiyana, Jalalabad and Moulvibazar Gas Fields and Tullow is producing in block 9 with Bangura Gas Field under the PSCs.⁶⁸⁷

⁶⁸³ Petrobangla, "Annual Report2015".

⁶⁸⁴ Ibid

⁶⁸⁵ Ibid

⁶⁸⁶ Ibid

⁶⁸⁷ Ibid

Table 4.1 Summary of the bidding of gas blocks in Bangladesh

Bidding Round	Awarded IOCs and blocks	Remarks
1974 Offshore Bidding Round	Atlantic Richfield (ARCO) Ashland Oil Union Oil Canadian Superior BODC (JNOC/JAPEX JV) Naftaplin (Yugoslav Oil Company INA)	Bidding was limited to near offshore areas and 6 of the then 7 offshore blocks. IOCs conducted 31,069 km of marine seismic surveys, drilled 7 wells, discovered the Kutubdia Gas Field in 1977.
PSCs in the 1980s	Shell Oil Company for Chittagong Hill Tracts (later block 22) and North West Bangladesh (later block 23).	Shell Oil conducted seismic surveys, and drilled 2 wells at Sitapahar and Salbanhat without any success, and relinquished their concessions.
	Scimitar Exploration for the Surma basin (later Block 13)	Scimitar discovered and relinquished Jalalabad gas field
1993 Bidding Round ⁶⁸⁸ Exploration ring-fenced of block 16 (Magnama ring-fence) is operated by Santos. Drilling operation is scheduled to take place in 2015.	Occidental (OXY) for blocks 12, 13 and 14 (Onshore)	Later transferred to Chevron which is producing from Bibiyana, Jalalabad and Moulvibazar fields
	Cairn Energy for blocks 15 (Onshore) and 16 (Offshore);	Cairn Energy discovered Sangu gas field in 1996 which produced until 2013. Blocks 15 and 16 have now been relinquished, except for the ring-fenced offshore Magnama structure which was transferred to Santos
	Oakland-Rexwood for blocks 17 and 18 (Offshore); United Meridian Corporation (UMC) for block 22 (Onshore)	Transferred to CFP Total which has relinquished both blocks relinquished;
1997 Bidding Round ⁶⁸⁹	Tullow/Chevron/Texaco/BAPEX for block 9 (Onshore);	
	Shell/Cairn/BAPEX for blocks 5 and 10	Relinquished in totality

⁶⁸⁸ 23 onshore and offshore blocks were offered in this bidding round and 8 blocks were awarded to 4 IOCs.

⁶⁸⁹ Provision for a mandatory 10% carried interest for BAPEX was introduced and implemented for all blocks during this bidding round.

Bidding Round	Awarded IOCs and blocks	Remarks
	(Onshore); Unocal/BAPEX for Block 7 (Onshore);	Relinquished in totality
2008 Bidding Round ⁶⁹⁰	ConocoPhillips for DS-10 and DS-11.	ConocoPhillips conducted total 5,750 lkm of 2D seismic survey in 2012 and 2013. Though a few prospects were identified, ConocoPhillips relinquished the blocks considering their investment not feasible.
2012 Offshore Bidding Round ⁶⁹¹	ONGC Videsh, Oil India and BAPEX for blocks SS-4 and SS-9	Initial exploration activities have started. ONGC has completed 3,000 lkm of 2D seismic survey data acquisition.
	Santos, KrisEnergy and BAPEX for block SS-11.	Conducted 3,050 lkm of 2D seismic survey in 2014 interpretation and integration of the data sets have been completed and submitted the report to Petrobangla in 2016.

⁶⁹⁰ Ensuing maritime boundary dispute with Myanmar in most of the blocks created a stalemate. Some IOCs participated in the bid.

⁶⁹¹ Petrobangla reshaped the blocks after the delimitation of the maritime boundary between Bangladesh and Myanmar by ITLOS in March, 2012. No PSC was signed for any deep sea block under this bidding round though three proposals were received for blocks DS-12, 16 and 21. However, there was some negotiation with the lone bidder, Norwegian oil exploration company, Stat-Oil.

Petrobangla reshaped the blocks after the delimitation of the maritime boundary between Bangladesh and Myanmar by ITLOS in March, 2012.

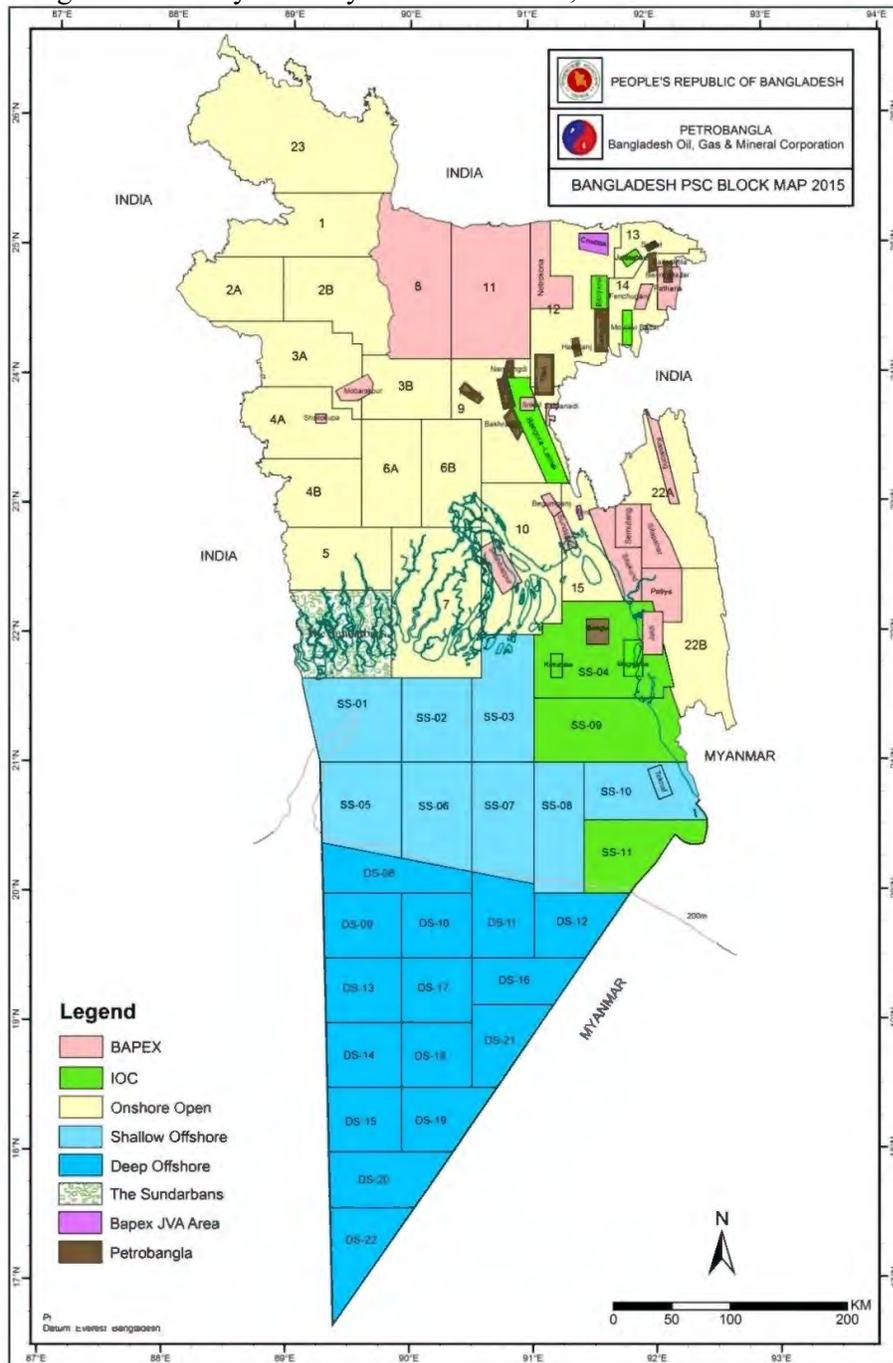


Figure 4.2 Current petroleum block map of Bangladesh⁶⁹²

⁶⁹² Petrobangla, "Annual Report 2015".

In the first stage under the new arrangement, eight blocks were awarded to 4 companies under PSC. Exploration and development activities in these blocks were rather limited and most of the blocks were moderately covered by seismic surveys. A total of 11 exploration wells were drilled, and three gas fields were discovered in these blocks. These fields are Moulvibazar, Sangu (Offshore) and Bibiyana. These three fields along with Jalalabad gas field discovered by Scimitar Exploration Ltd. were developed under PSC and are currently in production.

4.3 MODEL PRODUCTION SHARING CONTRACTS IN BANGLADESH

The first production sharing contract was signed in the 1980s with Shell, and the second was signed with Scimitar.⁶⁹³ At that time Bangladesh did not have any model production sharing contract and these contracts were signed between the Government of Bangladesh and the contractor based on negotiation. The first model production sharing contract in Bangladesh was the MPSC of 1988. It was revised in 1997; thereafter it was revised subsequently in 2008 and 2012. Lastly in 2019, a different MPSC was adopted for onshore and offshore. These MPSCs are analysed under different headings for better understanding of the revision of the MPSCs and the deviation of these MPSCs in actual contact.

In this chapter, the researcher analyses the different model production sharing contracts adopted at different times and examines the deviation in the actual contract. Actual contracts were obtained from the contract division of Petrobangla. Two massive blowouts took place in Bangladesh during the natural gas operation. The facts and consequence of these blowouts and the role of the IOCs and the regulatory bodies are also critically analysed in this chapter. Three actual contracts including one offshore one are analysed in this study. To make the study convenient, the contracts are renamed as A, B and C and listed in Table 4.2. Contracts A and B were signed with the same company. As a result the terms and condition of these contracts are almost same.

In contract C, SSFL, KEAL and BAPEX are combinedly conducting their function as contractor. As the contract was signed on March 12, 2014, it was based on MPSC of 2012. In this contract SSFL poses 45%, KEAL poses 45% and BAPEX poses 10% rights and interest respectively.⁶⁹⁴ After the bidding round of 1997 no onshore contract was signed. Only offshore contract was signed in bidding round of 2008 and 2012. Though the MPSC of 1988 has been updated in 1997 and thereafter 2008, and 2012, no new onshore contract was signed

⁶⁹³Gang Lu et al., *Gas Sector Master Plan 2017*, 243

⁶⁹⁴ Annex F of contract C.

according to the MPSCs of 2008 and 2012. However, the contract with Niko was signed for the abandoned and marginal field development but the full text of this contract was not availed by the researcher due to confidentiality. For this reason, the researcher has chosen an offshore contract to examine its compliance with the updated MPSC, though the offshore operation is not within the ambit of this study.

Table 4.2 Description of the studied contracts

Designation	Description of contract
Contract A	The parties were Government of The People's Republic of Bangladesh and Bangladesh Oil, Gas and Mineral Corporation (Petrobangla) and Occidental Exploration of Bangladesh Ltd. It was signed in 1994 for block 12.
Contract B	The parties were Government of The People's Republic of Bangladesh and Bangladesh Oil, Gas and Mineral Corporation and Occidental Bangladesh Ltd. It was signed in 1994 for blocks 13 and 14.
Draft Contract C	The parties are the Government of The People's Republic of Bangladesh and Bangladesh Oil, Gas and Mineral Corporation (Petrobangla) and Santos Sangu Field Ltd. (SSFL) and KrisEnergy (Asia) Ltd. (KEAL) and Bangladesh Petroleum Exploration and Production Company Limited (BAPEX) . It was signed in 2014 for block 11.

4.3.1 Interest of the State

Paragraph 4 of the preamble of MPSC 1988 clearly stated that all the power of the Government will be exercised by Petrobangla and acceleration of exploration and discovery of petroleum resources will be carried out for overall interest of the People's Republic of Bangladesh.⁶⁹⁵

Provision of gas export

In this contract, contractor was allowed to export the natural gas through pipeline as well as liquefied natural gas (LNG) under article 14.4 and 14.9. Though the MPSC permitted the export of gas through pipeline, both the contracts A and B did not incorporate the provision of gas export through pipeline. It was a very positive side considering the energy needs of Bangladesh and if the export was allowed then it would have been harmful for the overall

⁶⁹⁵Model Production Sharing Contract 1988, pmb1, Bangladesh Oil , Gas and Mineral Corporation, MoPEMR, Bangladesh.

development of the country. In the MPSC of 1997, the export was allowed only through LNG which continued in the provision of 2008.

Selling gas in domestic market

In the MPSC of 2008 the contractor was allowed to sell its natural gas in the domestic market subject to first refusal of Petrobangla. In the MPSC of 2012, a provision has been added ensuring the contractor's right to sell up to 50% of its share of the natural gas from the deep sea block in the domestic market without Petrobangla's first refusal. In other cases the first refusal of Petrobangla is required.⁶⁹⁶ In the MPSC of 2012, when the contractor sells its share gas in the domestic market, 4% of its total natural gas measured at the measurement point was to be paid to Petrobangla. This provision is very innovative to preserve the interest of the country.

Price of gas

Calculation of price also differed, as in the MPSC of 2008 the price of the gas from the offshore was 100% of the market value whereas in the MPSC of 2012 it was increased to 130% of the market value. Therefore, the yearly increment of gas price as 2% was also included in the revised MPSC of 2012.⁶⁹⁷ The addition of this provision was the demand of time as the same price for a long term of 25 to 30 years or even sometimes longer is not adaptable in the competitive market to attract the IOCs.

Administering fee

Under article 19 of the MPSC of 1988, the contractor shall pay to BOGMC an administering fee of 100 US dollars for per square kilometre of the contract area. The contractor will also pay an amount of USD in figure of million, subject to negotiation, within 30 days after the declaration of the commercial discovery.⁶⁹⁸ However, the provision of administering fee was abolished in the revised MPSC of 1997. The abolition of administering fee was suggested by the Petroleum Policy 1993. The term administering fee is also used as signature bonus in some petroleum production countries, e.g. Kazakhstan.⁶⁹⁹ This fee is payable without any initial exploration and on uncertainty of successful discovery,⁷⁰⁰ however it may reduce the

⁶⁹⁶Model Production Sharing Contract 2008, art.15.6(c) and Model Production Sharing Contract 2012 art.15.6(c) Bangladesh Oil, Gas and Mineral Corporation, MoPEM, Bangladesh.

⁶⁹⁷Model Production Sharing Contract 2008, art. 15.7(I)(d) and Model Production Sharing Contract 2012 art. 15.7(I).

⁶⁹⁸Model Production Sharing Contract 1988, art 19.

⁶⁹⁹“How to scrutinise a Production Sharing Agreement: A guide for the oil and gas sector based on experience from the Caspian Region,” Soros foundation Kazakhstan, p 40, available at <https://pubs.iied.org/pdfs/16031IIED.pdf> accessed on 02.12 2020

⁷⁰⁰“How to scrutinise a Production Sharing Agreement,” Soros foundation Kazakhstan, p 40,

interest of the IOCs. This abolition may be useful to increase the interest of the IOCs to invest in upstream operation.

Use of natural resources by charge

One of the very significant provisions of the MPSC of 1988 is the use of sands, gravel and water on payment by the operator,⁷⁰¹ and it is continuing through all the MPSCs till 2019. However, the use of these resources is free in most of the petroleum producing developing countries.⁷⁰² The PSCs A and B were signed in 1994 according to this MPSC.

Inclusion of good economic practice

Some deviations from the MPSC of 1988 are noticed in the actual contracts A and B. Article 2.4 of the contracts stated, “In performing Petroleum operations, contractor shall provide all financial requirements and employ the advanced scientific methods, procedures, technologies and equipment generally accepted in the international Petroleum industry and consistent with good economic practices.” The noticeable matter is that MPSC of 1988 imposed obligation to comply with standard that is acceptable to international petroleum industry while the actual contracts additionally included ‘consistent with good economic practices’. However, it may be appreciated as it would be beneficial to pave the way of sustainable development of natural gas extraction in Bangladesh.

Replace of the term ‘supervision’ with the term ‘approval’

The term ‘supervision’ is omitted and replaced with ‘approval’ in both the actual contracts though article 2.3 of MPSC of 1988 specifies that the work of the contractor is subject to the supervision and review by Petrobangla. The ambit of the term ‘supervision’ is to look after the entire period of operation including after or before the approval. Here the word ‘approval’ may limit the jurisdiction of Petrobangla.

The fixed quantity is replaced by ‘significant discovery’

The MPSC of 1988 declared that the estimated recoverable natural gas should be at least 500 Bcf for drilling appraisal well and developing infrastructure and market. Article 4.5 of contracts A and B use the phrase ‘significant discovery’ instead of ‘500 Bcf’, and it may allow the contractors with some discretion because ‘Significant discovery’ is a vague term as its amount may differ from person to person according to time, place and situation.

⁷⁰¹ Model Production Sharing Contract 1988, art. 9.2.

⁷⁰² Tienhaara, “Foreign Investment Contracts in the Oil & Gas Sector,” 15-20, 39-40.

Flexibility

In article 4, the MPSC of 1988 imposes an obligation of bank guarantee for the extension of exploration period whereas the actual contracts do not harbor the provision of bank guarantee but merely the commitment to provide the bank guarantee. So, inspite of the MPSC's aim to guide the contract, it is noticed that the concerned parties' have a tendency to deviate from that guideline. Flexibility is also found in article 4.7 of the contracts where it is found that if extension of period is required to complete the production, contractor should request Petrobangla by a notice 180 days prior to the end of such term which is fixed as 1 year in the MPSC. The MPSC of 1988 says that the contractor shall relinquish 25% of the original contract area at the end of the 3rd contract year, where the contract A incorporated it with the provision of relinquishing just by the end of the 2nd contract year.⁷⁰³ In the previous chapter, it is mentioned that there is a relation between the rate of recovery and the maximum recovery.⁷⁰⁴ High recovery rate may collapse the internal structure of the field which may result in less total yield from the field. Article 4.1 of the MPSC has allowed initial exploration period of 3 (three) years whereas in contract A, the parties have agreed for 2 years of initial exploration period. The duration of drilling well is reduced to 2 years whereas it was 3 years in the MPSC.⁷⁰⁵ It is one of the positive changes as the companies will be under an obligation to fulfill their contractual responsibilities by utilising the time period of the operation properly.

In all of the above cases the aim of the Government to increase the production and the target of the oil companies to maximise profit is noticeable.

Leaving the field beyond the production

Article 5.4 of the actual contracts state that it is the obligation of the contractor, on the request of Petrobangla (the then BOGMC), to relinquish the contract area, when the production is stopped for more than 1 year not on the ground of force measure, but in the MPSC of 1988 the duration was for 180 days. It is to be noted that 6 months more is allowed to the contractor to leave the field beyond production. Had it been 6 months according to the provision of MPSC, it would have been better for the sustainable natural gas production in Bangladesh.

⁷⁰³ Article 5.1 (a) of contract A.

⁷⁰⁴ Weaver, "Sustainable Development in the Petroleum Sector," 45-77

⁷⁰⁵ Article 5.2 of contract A.

Relinquishment of contract area

In article 6.5 of the MPSC of 1988 it is stated that the contractor is bound to perform its minimum work obligation timely but the phrase ‘on a timely basis’ is not present in the actual contracts. As a result the contractor gets maximum time to perform its work obligation. In part 6 of this contract, two new sub-articles are added stating that if the contractor abandoned any exploration well due to its technical reasons, it will be considered the fulfillment of the exploration obligation under this contract.⁷⁰⁶ Another new addition is that if the contractor relinquishes the entire area without completing its obligation under this contract, then the contractor will pay Petrobangla the proposed value of the work program deducting the cost that is incurred by the contractor and will be adjusted from bank guarantee.⁷⁰⁷ No such provision existed in MPSC of 1988. It seems that there is an opportunity for the companies to profit even from their non-fulfillment of the required obligation. If the contractor does not fulfill its obligation without any reasonable cause as the technical reason is not defined, then the contractor should not be allowed to deduct the cost that has already been spent.

Deviation of duration

Some deviation from the MPSC of 1988 are noticeable regarding the evaluation of petroleum potentiality of the contract area, where it is 90 days in the MPSC of 1988 but 120 days in the actual contracts.⁷⁰⁸ In case of preparation of work programme and budget, the contracts allow it 60 days in place of 30 days, which is reasonable, because time is needed to prepare the work programme and budget appropriately with careful scrutiny of its pros and cons.

In both the contracts A and B it is mentioned that the contractor shall notify Petrobangla within 90 days to show their interest if they find petroleum in any appraisal well, whereas, the time limitation is 30 days in the MPSC of 1988.⁷⁰⁹ An extension of 60 days in favor of the contractor is noticed here. The MPSC required the progress report monthly whereas the contract incorporated the provision of quarterly progress report.⁷¹⁰ Moreover, in case of submitting data to Petrobangla there is no provision to retain the data by the contractor in the MPSC but both the actual contracts A and B recognised such right through article 10.9.

⁷⁰⁶ Article 6.13 of contract B.

⁷⁰⁷ Article 6.14 of contract B

⁷⁰⁸ Article 6.7 of contract B

⁷⁰⁹ Model Production Sharing Contract 1988, art 8.1

⁷¹⁰ Model Production Sharing Contract 1988, art 10.11

Replacement of 'all individual' petroleum operation by 'major' petroleum operation

Another technical avoidance is also noticed in article 10.10 of contracts A and B where, the contractor is under an obligation to inform Petrobangla about 'all individual' petroleum operation but the contract replaced the phrase 'all individual' with 'major' and the contractor here has the opportunity to conduct operations which are not 'major' without the knowledge of Petrobangla. However, neither the contracts nor the MPSC define the term 'major operation'.

Responsibility of the parent company

Article 7.6 of the MPSC of 1988 is about the responsibility of the parent company to supply the financial and technical assistance to its assignee, as the assignee is required to fulfill the obligations of the contractor. This provision is included neither in contract A, nor in contract B. This provision is very important because the parent company should provide financial and technical assistance so that the assignee or the transferee could continue their function properly, complying with the terms and condition of this contract. The contract is made with the parent company, not with the assignee, keeping in consideration the former's capability to perform and ultimate liability should be borne by the parent company. Non inclusion of the provision of financial and technical assistance by the parent company may pave the way for the parent company to escape from their obligation and transfer the liabilities to the subsidiary without any obligation.⁷¹¹

Decision of the joint management company

In the contracts A and B another deviation from the MPSC of 1988 is that the decision of the Joint Management Committee (JMC) is to be decided unanimously. In the MPSC of 1988 it is said to be decided by the vote of the majority.⁷¹² The JMC is one of the significant bodies comprising of a Chairman and five members, and the Chairman and two members are from Bangladeshi nationals. Most of the major decisions are taken by this committee. Both the contracts A and B state that if the committee fails to reach an unanimous decision then it shall be referred to the secretary of the Ministry of Energy and Mineral Resources Division. The secretary has no casting vote to decide the matter, he can only offer assistance to reach an unanimous decision.

In 1997, the MPSC was revised but all the provisions of MPSC of 1988 that had an impact on the interest of the state have remained almost the same. Some modification is

⁷¹¹Model Production Sharing Contract 1988.art 7.6 .

⁷¹²Article 12.2 of Contract B.

noticed in the formation of JMC which comprises eight members and states that the decision of the JMC will be unanimous and if failed then the Secretary of the Ministry of Energy and Mineral Resources Division will try to reach an unanimous decision. This provision is also continued in the revised MPSC of 2008, 2012 and in the latest onshore MPSC of 2019.⁷¹³ It is worth mentioning that this revised provision was already incorporated in the contracts A and B, both signed in 1994.

In the MPSC of 2008, for the first time the gas block was divided into block A and block B where block A referred to onshore and block B referred to offshore blocks. In this model contract estimated recoverable gas is mentioned as at least 250 Bcf in the onshore and 125 Bcf for offshore. However, the MPSC of 2012 uses the term ‘the significant amount’ without specifying any certain amount. This provision was first inserted in the actual contracts of 1994 and finally was included in the revised MPSC of the 2012.⁷¹⁴

Provision of compensation

Provision was added to ensure the responsibility of the contractor to indemnify the Petrobangla and the Government for any loss or damage to third parties resulting from the negligence or wrongful act or omission of the contractor or sub contractor or their employees.⁷¹⁵ In the MPSC of 2008, the provision of compensation is added for damage and expenses resulting from the careless activities. But a new addition in the MPSC of 2012 is that the operator is liable to compensate for blowout and environmental damage.⁷¹⁶ It is noticeable that the term ‘shall’ is not used in the MPSC of 1997 to ensure the liability of the operator but it is included in the MPSC of 2008, 2012 and 2019. Though there is the provision that the operating company will bear the liability of the damages, no suit against the operating companies was filed by any individual directly affected from the blowouts of Magurchara and Tengratilla.

In the MPSC of 2012, initial estimated amount for development programme is not defined. Article 10.4 incorporates some provisions to ensure the sustainable extraction and the optimum recovery, minimising the loss and wastage. A considerable change is made in the MPSC of 2012 where the power of approval regarding the budget and work plan is vested on the Joint Management Committee, whereas in the former MPSCs Petrobangla held that

⁷¹³ Model Production Sharing Contract 2012, art 12.2.4.

⁷¹⁴ Ibid., art 8.7.

⁷¹⁵ Model Production Sharing Contracts of 1997, 2008 and 2012, art 10.21.

⁷¹⁶ Model Production Contracts of 2008 and 2012, art 10.27.

power.⁷¹⁷ Moreover, for unitisation, Article 33 was incorporated in the MPSC of 2008, which ensured the maximum recovery from the field and avoided unnecessary drilling.

To attract the IOCs in exploration and production activities, the Government has taken initiatives to make separate MPSC for onshore and offshore gas blocks. As a result, an onshore MPSC has been adopted in 2019. Article 4.2 of this MPSC specifies the obligation of the exploring company to drill a minimum number of wells before commencing the subsequent exploration within the extended period after the expiration of the initial exploration period. It is one of the significant improvements from the earlier MPSC as there was no obligation or specific condition on the companies to extend the exploration period.⁷¹⁸

Obligation to drill the exploration well

In the draft contract C it is mentioned that only one well is to be drilled by the contractor under the mandatory exploration programme in the initial exploration period. According to this draft, the contractor even can escape drilling any well in the minimum exploration programme because the negotiation is set to drill zero exploration well in this period. Therefore the contractor is allowed to conduct zero sq kilometer 3D and 2D seismic survey and to drill zero exploration well within the subsequent exploration period.⁷¹⁹ During this extension period, the contractor is not bound to drill even a single exploration well. The draft reveals that during the extension period, the contractor may exercise their discretion regarding time limit as there is no mandatory obligation, though the MPSC defines the time limit. It can be assumed that, these provisions were subject to negotiation at the time preparing the draft contract and Petrobangla could have paid more attention to the clauses of this draft.

According to the MPSC of 2012, the total exploration period for offshore block is 8 years including the extension, but the draft says that within this period the contractor is bound to drill only one exploration well. The exploration is emphasised to meet the rising demand of natural gas of Bangladesh, but the draft allows the contractor to work according to their wishes. Though the number of wells and the area under survey are biddable, the draft contract incorporates zero (0) in a number of these provisions. The MPSC of 2012 empowered the contractor to terminate the contract subject to payment of damage for failure to complete their above obligations. In contract C as the obligation of the contractor is only to drill one

⁷¹⁷Model Production Contracts of 2008 and 2012art 13.5.

⁷¹⁸ Onshore Model Production Sharing Contract 2019, Bangladesh Oil, Gas and Mineral Corporation, MoPEMR, Bangladesh, art 4.2.

⁷¹⁹Article 6.2.2 of Contract C.

exploration well, then quitting the contract after 8 years does not impose much difficulty to the contractor while the country becomes deprived for a long time for non-exploration as there is a rising demand of natural gas for the nation.

Joint operating agreement

There is no annexure for the joint operating agreement in the MPSC of 2012 though the draft contract C incorporates annex F to determine the terms and conditions for a joint operation agreement among the three operating companies. In this draft contract, BAPEX is a 10% carried interest partner and is not entitled to any cost recovery. BAPEX is also not responsible to bear any cost during the exploration and appraisal period.⁷²⁰ There is a provision of transferring the interest of the operating company, *i.e.* the company with majority share, to any assignee of its choice without any obligation to the other companies that are operating jointly.⁷²¹ In such cases, as the operating companies know very well about the block from the very beginning of the operation, in case of transfer there could have been a preference of the other companies operating jointly. Another matter of consideration is that if the transfer is made after the commercial discovery, provision may be added to transfer to a third party after refusal by the national company. However, no such provision is included in the draft. During the carried period the BAPEX has no voting rights and that will be exercised by the operator, and in this draft contract the operator is SSFL.⁷²²

Duration of petroleum contract

The production periods for oil field and gas field are 20 and 25 years respectively but MPSC of 2019 introduces the extension of production period by 10 years which was 5 years in the earlier MPSCs, though the terms and conditions of the extension are left to Petrobangla's discretion.⁷²³ This change is necessary, because production from the gas fields can continue even after 25 years. Titas gas field, which started production in 1968 and is still producing natural gas, is the practical example.⁷²⁴

Governing law of the joint operating contract

Article 29 of the MPSC of 2012 states that, the validity, interpretation and implementation of contracts shall be governed by the law of Bangladesh. One of the deviations of the draft contract C is that paragraph 7 of the annexure clearly states that the joint agreement contract will be governed by the law of England. This application of foreign law has been made

⁷²⁰ Annex F of contract C.

⁷²¹ Annex F of contract C, para 5.

⁷²² Annex F of contract C para 4 and 6.1(ii).

⁷²³ Onshore Model Production Sharing Contract 2019, art.7.2, art. 4.6.

⁷²⁴ <https://www.titasgas.org.bd/Pages/titas-at-a-glance/2/> accessed on July 10 2019.

possible under the provision of Private International Law. However, it could have been better to govern the contract by law of Bangladesh as it is also permissible by the private international law because article 29 of the MPSC of 2012 states that “the validity, interpretation and implementation of the contract shall be governed by the law of the Peoples’ Republic of Bangladesh”,⁷²⁵

The MPSC of 2019 introduces separate bank guarantees for seismic programme and drilling programme.⁷²⁶ This MPSC is updated to adjust with the changing circumstances, but the provision of article 8.9, continued from the early MPSCs states that the contractor will proceed for development stage after completion of the appraisal programme, promptly (without defining any certain period) which, may facilitates a scope for the contractor to utilise their discretion to develop according to their own need. The objective of the new MPSC is to accelerate production to meet the rising demand. In such cases, it would have been better to have a specific time limit within which the contractor has to come into operation.

Payment of income tax

A positive change incorporated in this MPSC is that before adoption of this MPSC the income tax on the profit-gas of the contractor was paid by Petrobangla but the new provision ensures the payment of income tax by the concerned contractor or contractors.

Before MPSC of 2019, no previous MPSC used the term joint venture while the joint venture activities have already been carried out for a long time under article 10.22 of the model contract where the term used is ‘contractor comprised more than one entity’. The new MPSC specifies the status of BAPEX as the carried partner.⁷²⁷ The annex F of onshore MPSC of 2019 specifies that BAPEX holds 10% of the carried interest.⁷²⁸

4.3.2 Environmental Management

In 1988, the environmental concern was not a significant issue, so it was not explicitly included in the MPSC of 1988. There was also no specific environmental legislation in Bangladesh at that time. In article 8.10 of the MPSC of 1988, the provision of submitting of the development plan to BOGMC was included; development plan included an evaluation report, which was mainly focused on the commercial discovery, but no report on environmental aspect was required in the plan, in the period of either operation or

⁷²⁵ Model Production Sharing Contract 2012, art 29

⁷²⁶ Onshore Model Production Sharing Contract 2019, art. 7.2.

⁷²⁷ Onshore Model Production Sharing Contract 2019, art. 10.22.

⁷²⁸ Ibid., Annex F.

emergencies. The development plan did not include any environmental aspect of the operation though article 10.6 confirmed the obligation of the contractor to conduct operation with the necessary measures required for the protection and preservation of life, property and environment.⁷²⁹

It is stated in article 5.6 of contracts A and B that the contractor is obliged to pay an amount to Petrobangla, for voluntary relinquishing of the right to petroleum operation of entire contract area without fulfilling their all accrued obligations. There was no provision for payment for environment pollution as there was no specific legislation in Bangladesh in this regard. MPSC of 1997 also did not provide any protection for the environment during relinquishment but paid attention to take necessary action preventing hazards to human life and property, though there was definite legislation regarding protection of the environment.⁷³⁰ In both contract A and B the valuation of relinquishment is determined according to the size of the contract area.⁷³¹ However, no environmental consideration is there and only economic aspect is highlighted, which does not make the natural gas operation sustainable. In the model contract of 1988, there was no provision of abandonment, but a provision was added to remove the facilities, equipments and installation at the time of relinquishment in order to restore the area to its former condition as much as possible.⁷³² Both the contracts state that prior to relinquishment the contractor shall take necessary action to prevent the hazard to human life and property as the joint review committee or the joint management committee considers reasonable.⁷³³ The consideration of the joint review committee or the joint management committee is a new addition to the actual contracts as it was absent in MPSC of 1988. As the three members of the joint review committee are selected from the company personnel and three from nationals, so what is reasonable to the company's personnel may not seem so to the national members. It could have been better left to the discretion of Petrobangla. Restoration of the area to its previous form, required by article 5.9 (a) in the MPSC of 1988 is not included in contracts A and B. However, restoring the area to its previous condition is one of the crucial elements to rehabilitate the inhabitants of that very area. There is also the case of the ethnic groups living in the area. The state is constitutionally obligated to protect their rights, though it was not in the Constitution during

⁷²⁹Model Production Sharing Contract 1988,art 10.6.

⁷³⁰ Model Production Sharing Contract 1997,art 5.9(c), by this time the Bangladesh environment conservation act 1995 and Bangladesh Environment Conservation Rules 1997 has been enacted.

⁷³¹ Article 6.14.of both the Contracts A and B.

⁷³² Model Production Sharing Contract 1988,art 5.9 (a).

⁷³³ Article 5.9(iii) of both the Contracts A and B.

the signature of the contracts. Only the economic aspect was prioritised in this provision. In both Contracts A and B, the cost of emergency dealings is subject to cost recovery but if any emergency situation arises due to the negligence of the contractor then the liability of the contractor is not defined.⁷³⁴ Unfortunately, the Magurchara blowout occurred in block 14 under contract B.

Ambiguity also exists in article 9.7 of contracts A and B, where it is stated that in case of changing or enacting laws and regulations that affect the cost of the contractor, the cost will be subject to cost recovery. But if Rules were framed under Petroleum Act 1974 to ensure inspection of petroleum operation, regulation of the good oil field practice, and conservation of natural resources, then the increased cost would not be within the domain of the cost recovery. Both the contracts were signed in 1994 and the Bangladesh Environment Conservation Act was passed in 1995. The relevant question is whether this Act of 1995 is taken into consideration to ensure the above mentioned purposes or not. As the protection of environment is one of the essential aspects of the good oil field practice.

Annex D of the contracts A and B enumerate that the contractor should submit quarterly and annual reports to Petrobangla along with other reports on survey, drilling and production of the petroleum. In context of geological survey report should be submitted within 90 days after completion of the test but the contracts have changed the time to 120 days. Another matter of significance is that no report on environment is required under annex D. Though the amount of gas flared is to be reported daily, the impact of the petroleum operation on environment is not subject to reporting or even testing.

It is noticeable that there are many changes regarding the time frame in different provisions, though it should have been better considered regarding how far these changes contributed towards sustainable development of natural gas in Bangladesh. Environmental obligation was not well-articulated, just the provision of good international petroleum industry practice was mentioned to be followed. It is to be noted that there is no universal good international petroleum industry practice, as stated in the previous chapter.

The term “necessary precaution” of the MPSC of 1988 is replaced by the term “reasonable precaution” in the contracts. In both the contracts the word ‘reasonable’ is used in article 10.6.6 which provides the contractors with the opportunity to technically avoid the contractual obligation under the veil of the “reasonable precaution” instead of “necessary precaution”. It is stated in contracts A and B that while conducting petroleum operation, the

⁷³⁴Article 6.12 of Contract B.

company will take necessary steps to conserve and protect the environment by taking all reasonable precautions to prevent pollution of or damage to the environment. The Contracts do not emphasise environment and its related issues, as nowhere in article 10.6 of the MPSCs the term ‘shall’, which prescribes the obligations of the contractor, is used. However, it seems that with the use of the phrase ‘reasonable precaution’ the environmental obligation was subject to the discretion of the contractor.⁷³⁵

4.3.2.1 Magurchara Blowout

On 14 June 1997, a massive blowout occurred in block 14, at Magurchara, in Kamalganj Upazila of Moulavibazaar.⁷³⁶ It is found in contract B that the block was operated by Occidental, a US company. This blowout caused a huge amount of damage. 96 acres of the adjoining Louwachara forest was completely burnt. Besides, a Teak timber garden that was established during 1944-1950, a bamboo garden planted between 1993 and 1995 and a strip of plantation planted in 1994 suffered enormous damage.⁷³⁷ Moreover, 50% of the forest resources on 111.15 acres land, and 30% of reserve forest on 106.21 acres were also damaged due to this blowout.⁷³⁸ Following the blowout, two committees were formed by the Government, one was for the assessment of loss and another investigation committee to survey the area. According to the report submitted by these committees, the entire loss for the destruction of the forest amounted to BDT 9858 crore. Moreover, 29 tea gardens were also affected for which the loss is an amount of BDT 46.07 crore. Apart from the above losses the railway department suffered the loss of BDT 21 crore, the Jalalabad gas company BDT 13 crore for destroying their pipeline, the electricity department BDT 1.35 crore and the Khasia community BDT 18 lack for the damage of their betel leaf.⁷³⁹ 200 Bcf gas worth 500 million US dollar was wasted due to the blowout, and the total loss is estimated at about BDT 9000 to 14000 crore.⁷⁴⁰ Lack of supervision and coordination has been found as the reason for the blowout.⁷⁴¹ The committee also opined that the loss done to the ecology was not possible to restore within 50 years. The affected forest land was a safe habitat for many animals and

⁷³⁵ Article 10.6.4, 10.6.5 and 10.6.6 of Contract B.

⁷³⁶ Moulvibazar Correspondent, “No Compensation of Blowout in 19 Years,” *The New Nation*, June 14, 2016.

⁷³⁷ *Ibid.*

⁷³⁸ *Ibid.*

⁷³⁹ *Ibid.*

⁷⁴⁰ Tribune Desk, “Compensation Still Lacking 22 Years on from Magurchara Tragedy” *Dhaka Tribune* June 14, 2019. <https://www.dhakatribune.com/bangladesh/nation/2019/06/14/compensation-still-lacking-22-years-on-from-magurchara-tragedy>, accessed on 23-11-2019.

⁷⁴¹ Zakia Afrin, “Foreign Direct Investments and Sustainable Development in the Least-Developed Countries,” *Annual Survey of International & Comparative Law* 10, no.1 (2004): <http://digitalcommons.law.ggu.edu/annlsurvey/vol10/iss1/9>

organisms and experts said that the damage done to flora and fauna was not recoverable.⁷⁴² To describe the impact of the blowout on the environment, it was reported that “The soil has not only lost its fertility but has also become inappropriate for construction of any heavy structure. The gas fire denuded the surrounding 700-acre reserved forest, rich in flora and fauna. The land will not be good for trees, tea and crops and vegetables for 50 years, according to soil scientists”.⁷⁴³ The environmentalists opined that the loss on the environment was multiplied due to continuation of blowout for a long time for which the area would face extinction of some wild species and green cover.⁷⁴⁴

Twenty-three years have already passed and there is no compensation. The investigation committee pointed out 15-16 faults of the company as the reasons for the blowout but the company raised objection regarding 2-3 faults.⁷⁴⁵ It means that the company admitted its other faults. Despite the acknowledgment, without paying any compensation Occidental signed a supplementary contract with Petrobangla in 1998.⁷⁴⁶ Occidental refused to pay compensation denying its responsibility and claimed an inquiry by third party to determine the damage resulted from the blowout and UNEP was agreed to act to this end.⁷⁴⁷

Thereafter, Occidental handed over the exploration and production right to another US company Unocal and Unocal further transferred to Chevron, another US company, which is now in operation. Neither Occidental nor Unocal and Chevron can deny their liability as they are under the obligation to comply with law of the host country.⁷⁴⁸ Moreover, Occidental also violated the requirement of DoE. Any project operating in Bangladesh must obtain an ECC from the DoE. Occidental also applied for ECC and DoE further asked to fulfill some terms and conditions as the requirement of granting the ECC. The company did not return to the DoE though they started operation in the field.⁷⁴⁹ No information regarding any initiative taken from DoE to file a suit for violating the law to which the company was bound to comply as mandatory requirement of the DoE is available, which indicates that no such case may have been filed. Rather, Chevron filed a suit in 2007 before the ICSID (International

⁷⁴²Tribune Desk, “Compensation Still Lacking 22 Years on from Magurchara Tragedy,” *The Dhaka Tribune*, June 14, 2019. <https://www.dhakatribune.com/bangladesh/nation/2019/06/14/compensation-still-lacking-22-years-on-from-magurchara-tragedy> accessed on May 23, 2020.

⁷⁴³ Report by Well Flow Dynamics describing the Damage in Magurchara Gas Tragedy cited in Afrin, “Foreign Direct Investments and Sustainable Development in the Least-Developed Countries”

⁷⁴⁴Afrin, “Foreign Direct Investments”

⁷⁴⁵ Tribune Desk, “Compensation Still Lacking”.

⁷⁴⁶Afrin, “Foreign Direct Investments”

⁷⁴⁷Afrin, “Foreign Direct Investments”

⁷⁴⁸ Ibid.

⁷⁴⁹ Ibid.

Centre for Settlement of Investment Dispute) against Bangladesh to refund an amount of US\$ 240 million. This amount was deducted according to the provision of the contract as Chevron used Petrobangla's pipeline for transmission.⁷⁵⁰ It was stipulated in article 13.7.3 of contract B that "The transmission company shall be entitled to receive four percent (4%) of contractor's total natural gas measured at the measurement point during a calendar year under a delivery schedule to be agreed upon between contractor and the transmission company to cover tariffs and losses incurred when contractor uses a pipeline operated by the transmission company to supply natural gas to the Bangladesh domestic market."

Though, in the end, the ICSID delivered its verdict in favour of Bangladesh which not only ensured the amount of 240 million US dollars but also paved the way to secure 4% tariff for using the transmission system of Petrobangla until completion of the operation,⁷⁵¹ this incident leads one to question the efficiency of the regulatory body in the petroleum sector of Bangladesh. Though the country lost millions of dollar due to the accident for which the company was liable, without paying any compensation, the transferee of the liable company filed a suit against Bangladesh to recover the amount that was legally paid to Petrobangla.

Although as a transferee, Chevron is legally bound to compensate for the blowout, it has not happened yet. It shows that when the investor gets inside the boundary of the host state, it is quite tough to implement the national environmental laws on them due to poor infrastructural structure or for the apprehension of losing further investment.⁷⁵² All these reveal that there is weakness in the legal and regulatory framework for the petroleum activities in the country and it is resulting in inefficient dealings that causes hazardous blowout.

Article 8.5 and 8.6 of the MPSC 1997 state about an evaluation report of the appraisal programme, but it does not include environmental evaluation report, abandonment plan and emergency dealings in spite of having environmental legislation. After the Rio Declaration the concept of sustainable development was recognised worldwide but no clause reflecting this concept was inserted in the development plan to ensure the sustainable development of petroleum resources. A very significant change was the incorporation of article 10.23, which made the contractor bound to comply with the laws, rules, regulations, decree and ordinance of Bangladesh and ensure protection of air, water, land and ecology. Therefore, the contractor

⁷⁵⁰ Zafar Sobhan, "Re: Incompetent Lawyers Costing Country Dear," *Daily Online Alochona*, May 31, 2011. <https://dailyalochona.blogspot.com/2011/05/alochona-re-incompetent-lawyers-costing.html> accessed on October 29, 2019.

⁷⁵¹ Sobhan, "Re: Incompetent Lawyers"

⁷⁵² Afrin, "Foreign Direct Investments"

is also under the obligation to conduct the Environmental Impact Assessment (EIA) according to Environment Conservation Act 1995 subject to the clearance of the ministry of Environment and Forest.⁷⁵³

The MPSC of 2008 provides a very significant definition of the petroleum operation. “Petroleum Operations” means the Exploration, the Appraisal, the Development, the Production and Abandonment related operations along with other activities including environmental considerations (IEE and EIA) and Environmental Management Plan (EMP) related to those operations carried out under the Contract.⁷⁵⁴ By this time, two devastating blowouts have occurred but no separate part concerning the protection of the environment is incorporated in the revised MPSC of 2008. Article 8.11 of this MPSC describes some of the provisions in the development plan, which include the incorporation of the safety measures, emergency dealings, anticipation of the negative environmental impact and its minimisation method as well as protection of the general environment.⁷⁵⁵ However, this provisions are generalised in nature. Article 10.23 incorporates the provision of EIA, Initial Environmental Examination (IEE) and Environment Management Plan (EMP) required by Environmental Conservation Act of 1995 and Rules of 1997. Nevertheless the provision of the social environmental impact assessment is not inserted either in the former or in the latter MPSC though it is one of the essential ingredients for sustainable petroleum extraction.⁷⁵⁶ Therefore, provision without proper monitoring may become less effective but no monitoring process is described in this model contract.

Article 10.19 of the MPSC of 1997 mentions the insurance coverage of some issues, including environment pollution occurring during the operation. No provision of insurance coverage is included for environmental damage resulting from accidents during the petroleum operation. Article 10.19 of MPSC 2008 states that the insurance of the petroleum operation which includes the loss, damages and injury caused by pollution during the operation along with the cost of removing the wreck and debris of the accident and cleaning up the pollutants resulting out of the accident.⁷⁵⁷ The MPSC was revised after 11 years of the Magurchara accident and 3 years after the Tengatilla accident but no provision was added for insurance coverage of environmental damage resulting from the accident. Environmental damage is an inevitable consequence of the accident of petroleum operation and it was evident in the

⁷⁵³Model Production Sharing Contract 1997 art. 10.23.

⁷⁵⁴Model Production Sharing Contract, 2008, art. 1.65.

⁷⁵⁵Model Production Sharing Contract, 2008, art 8.11(g) .

⁷⁵⁶United Nations, “Berlin II Guidelines”.

⁷⁵⁷Model Production Sharing Contract 2008, art. 10.19.

Magurchara of Moulovibazar (1997) and Tangratila of Sylhet (2005).⁷⁵⁸ Provision of insurance coverage was made for the removal of pollutants, wreck and debris of the accidents but not to recover environmental damage and the cost of the gas lost caused as a result of blowout.⁷⁵⁹ The term ‘loss of property’ is mentioned in this article but it is a matter of confusion whether the gas lost as a consequence of the blowout will be included in the property or not. It should have been more specific. The insurance coverage assured the recovery of financial damages but the accident of petroleum operation resulted in a huge environmental hazard on which no consideration was shown at all.

The development plan required to submit under article 8.11 inserted the remedial measures to be taken by the contractor during the emergencies but no provision was included about the quick response in case of emergencies and accidents and the remedial measures of failure to respond by the contractor in such emergencies and accident.⁷⁶⁰ In case of abandonment there is a provision for the abandonment fund but in environmental perspective no such requirement of fund, which will be supportive to restoration of the environment in its earlier state as far as possible, is mentioned. This MPSC also did not deal with process of dumping, as the operation discharged significant amount of cuttings, effluents, fluids etc but no specific way is provided to deal with these substances.

The natural gas operation is associated with the gas flaring which is very common in almost every petroleum operation. All the MPSCs from 1988 to 2019 have empowered the contractors to flare the associated gas in case of Petrobangla’s refusal to recover it, which will be offered to Petrobangla by the contractors on the ground that it is not economically viable for them to extract it. Such flaring is to be included in the development plan that is submitted according to article 8.10 of the MPSC. Although priority is given to recover the gas through the state owned enterprise, no provision is added to re-inject the gas as to avoid flaring. It seems that economic interest is prioritised over environmental consideration, as it significantly affects the air quality of the concerned region. However, a considerable amount of gas flaring is usually found in developing and under developed countries of which regulatory institution as well as the infrastructure is weak.⁷⁶¹ Chevron, now operating in Bangladesh, re-injects the water in the gas field without dumping it in the ground water

⁷⁵⁸Islam and Raihan, “Natural Gas Management: A Bangladesh Perspective,”

⁷⁵⁹Onshore Model Production Sharing Contract 2019, art. 10.19.

⁷⁶⁰Model Production Sharing Contract 2008, art. 8.11.

⁷⁶¹Tienhaara, “Foreign Investment Contracts in the Oil & Gas Sector,” 15-20, 39-40.

bodies.⁷⁶² It could have been better if the provision of re- injection of gas that is subject to flare had been introduced by environmental cost benefit analysis to make it a more sustainable operation.

The MPSC of 2012 has added a separate chapter regarding the protection of environment. It has included that any expenses and damages resulting from the environmental damage and blowouts are not subject to cost recovery, if the reason is the carelessness or negligence of the contractor. In such circumstances, the contractor is under the obligation to compensate for such loss and damages.⁷⁶³ Actually, inclusion of such provision was the urge of time, as Bangladesh faces a number of obstacles to recover the compensation of Magurchara and Tengratilla blowouts resulting from the negligence of the operators.

In the same MPSC, priority has been given to the preservation of natural resources and minimising the damage to the people and property, but natural heritage of specific areas are not considered as significant environmental ingredient.⁷⁶⁴ Another matter of consideration is that the biodiversity and whether it will be considered as the property or natural resources is not mentioned in the MPSC of 2012. The generally accepted environmental practice of the international petroleum industry requires that when the contract areas are within the nationally reserved areas then contractor will take necessary measures to minimise the negative impact on that area.⁷⁶⁵ However, in the onshore MPSC of 2019 the protection of environment is ensured through article 36 of the MPSC and a new term “prevention of biodiversity loss” is incorporated along with the environmental damages. It indicates the good will of the Government to protect the biodiversity during the petroleum operation. In the starting of this article, the negative impact on the environment is recognised by both the Government and the contractor.

4.3.2.2 Tengratila Blowout

Niko, a Canadian company, constituted according to the laws of Barbados, finalised a Joint Venture Agreement (JVA) with the BAPEX to develop the abandoned and marginal gas fields.⁷⁶⁶ Niko initially evaluated three marginal and abandoned gas fields of Bangladesh Chattak, Feny and Kamta and finally decided to develop two of them as prospective fields:

⁷⁶²Sharier Khan, “Bibiyana Field Much Larger than Thought,” *The Daily Star*, January 19, 2013.

⁷⁶³Model Product Sharing Contract, 2012, art. 10.27.

⁷⁶⁴Model Production Sharing Contract, 2012, art. 36.2.

⁷⁶⁵Tienhaara, “Foreign Investment Contracts in the Oil & Gas Sector,” 15-20, 39-40..

⁷⁶⁶Kamal Uddin Bhuiyan and Md. Jahangir Alam, “Niko Case and the Prospect of Foreign Investment in Bangladesh,” *The Daily Star*, November 17, 2014.

one is Chattak 2 in Tengratila and another is in Feny. During the drilling in the Chattak gas field, a blowout occurred on January 7, 2005 and subsequently another blowout occurred on June 24, 2005 at the same field.⁷⁶⁷ The fire rose up about 60 meters, and mud and rocks were spewed out,⁷⁶⁸ which forced thousands of villagers from nearby villages to leave their homes due to safety reason. These two blowouts have caused massive damages as the gas field is abandoned for near about 20 years,⁷⁶⁹ while some of the geologists opined that these two blowouts have damaged the underground reserve in such a way that the gas field has become unfit for further operation.⁷⁷⁰ The government investigator found that Niko was responsible for the January blowout which caused loss of 280 million cubic meters of gas worth US\$ 2.5 million.⁷⁷¹ Surprisingly, the Government claimed compensation only for the damage of 9 Bcf gas and total claim for environmental damage was BDT 84 crore whereas the Economic Association of Bangladesh estimated an amount of at least BDT 3175 crore for environmental harm and gas lost.⁷⁷² It is alleged by a number of energy observers that the claim of the Government was based on the report that was unduly influenced by the IOC. It showed that for the individual benefit of some of the government high officials, the valuable asset of the impoverished nation is robbed.⁷⁷³

Writ Petition

Following two successive blowouts, an NGO, Bangladesh Environmental Lawyers Association (BELA) in Bangladesh, working on the environmental issues, filed a writ petition as public interest litigation in 2005. This petition was filed against Ministry of Power, Energy and Mineral Resources, Ministry of Environment and Forest Department, Petrobangla and BAPEx, Director General of the Department of Environment and Niko Resources Bangladesh Ltd. and Niko Resources Canada. The writ petition was on the ground that the joint venture agreement between Niko and the BAPEx is without lawful authority and of no legal effect, for restraining payment to Niko regarding the gas supply from the Feni gas field and to seek direction of the court to direct the Ministry of Power, Energy and Mineral Resources, Ministry of Environment and Forest Department, Petrobangla and BAPEx to take

⁷⁶⁷Bhuiyan and Alam, "Niko Case and the Prospect."

⁷⁶⁸The Age, "Villagers Flee Fire at Bangladesh Gas Field," *The Age* June 26, 2005. <https://www.theage.com.au/world/villagers-flee-fire-at-bangladesh-gas-field-20050626-ge0et8.html> accessed on January 10, 2020.

⁷⁶⁹Ibid.

⁷⁷⁰Badrul Imam, "Contemplating Loss of a Gas Field: Tengratila Case Study," *The Daily Star*, 23 July, 2007. <http://archive.thedailystar.net/2007/07/23/d707231501127.htm> accessed on November 23, 2019.

⁷⁷¹The Age, "Villagers Flee Fire"

⁷⁷²Imam, "Contemplating Loss of a Gas Field: Tengratila Case Study"

⁷⁷³Ibid.

immediate effective measures in order to ensure the full compensation for the damage to natural gas, environment and property resulted from those blowouts.⁷⁷⁴ It was stated by the petitioner that during the submission of the offer letter by Niko it was stated that operators would develop the fields according to the internationally prevailing terms regarding the development of the marginal field, act in safe and environmentally responsible manner as it never had a blowout.⁷⁷⁵ It was alleged by the petitioner that the joint venture agreement was signed regarding the Feni, Kamta and Chattak gas fields. The Chattak gas field was divided as Chatak East and Chattak West. Chattak East was an exploration prospect field and was not included at first within the marginal and abandoned field. Subsequently it was included within the marginal and abandoned field due to the undue influence of the Niko Resources Bangladesh Ltd. based on the legal report obtained from M/S Moudud Ahmed and Associates. There were also arguments regarding the study jointly carried out by BAPEX and Niko Resources Ltd titled “Bangladesh Marginal Field Evaluation Chattak, Kamta and Feni” where Chattak West was described as discovered field and Chattak East was mentioned as an exploration prospective field. Therefore, the title “Procedure for Development of Marginal/Abandoned Gas Field” was developed by the Ministry of Power, Energy and Mineral Resources Division of which, clause 3 clearly pointed to the formation of a technical committee to evaluate the geological, geophysical and engineering data, production history, cost effectiveness, size, remaining reserve, cost of production and other concerns regarding the field. In that procedure the Chattak East was not included as marginal field. However, due to the persistent influence of Niko Resources Bangladesh Ltd, Chattak East was inserted as the marginal field in clause 12 of the same development procedure.⁷⁷⁶

Finally, the court concluded that the joint venture agreement was not procured on a defective way but the two successive blowouts caused massive loss and damage to the life, property and the people of the adjoining area. The court also held that a number of committees were formed after the blowout and all the reports concluded similarly that Niko was liable for the blowouts and it could be avoided if Niko was diligent to discharge their duties. The committee no.1 submitted report stating that the Niko Resources Bangladesh Ltd. may be directed to pay an amount of BDT 1,13,27,000 to the victims of the blowouts as

⁷⁷⁴The Judgment of writ petition No. 6911 of 2005, High Court Division, Supreme Court of Bangladesh.

⁷⁷⁵The Judgment of writ petition No. 6911 of 2005.

⁷⁷⁶Ibid.

compensation.⁷⁷⁷ All the committees recommended to realise the compensation from Niko. Moreover, the court also held that there was no denial of the fact that the successive blowouts caused huge damage to life, property, cattle, fisheries and trees of that area and Niko must compensate for this loss adequately. Though the judgment did not use the term environmental damage but the above sentence referred to the same meaning. However, during the judgment of this petition a money suit for compensation of an amount of BDT 746,50,83,973.00 against Niko was pending in the Joint District Judge Court. The Honourable Bench decided that Niko must compensate for the loss resulted from the blowouts and issued an injunction to refrain the Government from making any payment in respect of supplied gas from the Feni gas field until the decision of the lower court regarding the pending suit or before amicable settlement which one is earlier. Niko was also directed to pay the compensation as per the decision of the pending suit.

Following the judgment of the High Court division, the Niko Resources Ltd. filed a suit in ICSID in April 2010 challenging its liability for the blowouts of Tengratilla. Thereafter another suit was filed by Niko in the same forum contesting the decision of the Supreme Court of Bangladesh regarding the postponement of payment for the gas supplied from the Feni gas field.⁷⁷⁸ Niko's suit regarding the liability for blowout was dismissed in august 2013 and the second suit was stayed in the next year until the compensation issue on the Tengratilla blowout is resolved.⁷⁷⁹ On September 14, 2015 the ICSID ordered that "(1) Petrobangla shall pay to Niko forthwith and free of any restrictions USD 25,312,747 and BDT 139,988,337, plus interest (a) in the amounts of USD 5,932,833 and BDT 49,849,961 and (b) as from September 12, 2014 at the rate of six month LIBOR +2% for the U.S. Dollar amounts and at 5% for the amounts in BDT, compounded annually",⁷⁸⁰. The Tribunal was silent about the issue of compensation but said that without the order of the Government of Bangladesh, Niko cannot sale their property. Following this Bangladesh claim an amount of over 1 billion USD for the loss of the government and BAPEX, a subsidiary of

⁷⁷⁷The Judgment of writ petition No. 6911 of 2005.

⁷⁷⁸ Sobhan, "Re: Incompetent Lawyers Costing Country Dear".

⁷⁷⁹Staff Correspondent, "Bangladesh Wins Compensation From Niko Over 2005 Gas Field Blowouts," bdnews24.com, May 3, 2020. [https://bdnews24.com/business/2020/05/03/bangladesh-wins-compensation-from-niko-over-2005-gas-field-blowouts#:~:text=An%20international%20tribunal%20has%20ordered,in%20Sunamganj's%20Chhatak%20in%202005.accessed on June 20, 2020.](https://bdnews24.com/business/2020/05/03/bangladesh-wins-compensation-from-niko-over-2005-gas-field-blowouts#:~:text=An%20international%20tribunal%20has%20ordered,in%20Sunamganj's%20Chhatak%20in%202005.accessed%20on%20June%2020,2020)

⁷⁸⁰Tasmiah Nuhiya Ahmed, "ICSID Tribunal Verdict: Dhaka wins compensation case against oil giant Niko, State Minister for Power: "B'desh may get \$1bn compensation," available at <http://www.ourtimebd.com/beta/2020/05/04/icsid-tribunal-verdict-dhaka-wins-compensation-case-against-oil-giant-niko-state-minister-for-power-bdesh-may-get-1bn-compensation>. accessed on July 7, 2020.

Petrobangla.⁷⁸¹ On February 28, 2020 the Tribunal delivered its verdict in favour of Bangladesh and stated that Niko is liable for the blowouts because of its failure to comply with the standards of international petroleum industry and to conduct the operation diligently.⁷⁸²

The Tribunal also directed the Government to ascertain the damage to environment and health resulting from the blowouts, and to determine the amount of compensation at the next phase of the pending suit.⁷⁸³ It should be pondered upon that the Tribunal had to tell the State to claim their rights. The environment, which was drastically affected and the people who had to leave their houses were not adequately addressed in the international forum as Barrister Moin stated that Bangladesh will claim additional compensation for the damage to environment and health of the people of the surrounding areas of the gas field.⁷⁸⁴ The amount was claimed for BAPEX, Petrobangla and the Government but not for the community who were adversely affected by the blowout. On the contrary, in the blowout of the Gulf of Mexico the damage for the environment was determined at an amount of 7.1 billion for the violation of Oil Pollution Act and 5.5 billion for violation of Clean Water Act.⁷⁸⁵ However, in Bangladesh no such compensation has been claimed under any specific environmental legislation. This is because of the contractual obligation where the compliance with the national environmental legislation and the consequence for failure to comply is not clearly defined.

Another writ petition was filed in the high court division of the supreme court of Bangladesh by Professor Shamsul Alam an energy expert against the Government of The People's Republic of Bangladesh represented by the Secretary of Power, Energy and Mineral Resources Division, Petrobangla, BAPEX, Niko Resources Bangladesh Ltd. and Niko Resources Ltd. The petition was on the ground that the respondent no. 1, 2, and 3 did not act in accordance with the constitution because (1) the JVA and Gas Purchase and Sale Agreement (GPSA) were not treated as *void ab initio* having evidence that it was procured through bribery, fraud and corrupt means, (2) the *mala fide* and continuing failure to claim adequate compensation for two successive blowouts that happened due to failure by Niko to

⁷⁸¹ "Tengratila Blowout: Bangladesh Wins Case Against Niko" *UNB news*, May 3, 2020, available at <https://unb.com.bd/category/Bangladesh/tangratila-blowout-bangladesh-wins-case-against-niko/51008>.

⁷⁸² Tuhin Shubhra Adhikary and Rezaul Karim Byron, "Tengratila Blowouts: Niko Liable, Must Pay Damages," *The Daily Star*, May 4, 2020.

⁷⁸³ Adhikary and Byron, "Tengratila Blowouts".

⁷⁸⁴ "Tengratila Blowout: Bangladesh Wins Case Against Niko"

⁷⁸⁵ Bill Chappell, "U.S. Settles Claims Against BP Over Deepwater Horizon Spill For \$20 Billion," October 5, 2015 <https://www.npr.org/sections/thetwo-way/2015/10/05/445983039/u-s-resolves-claims-against-bp-over-deepwater-horizon-spill> accessed on June 11, 2020.

act in a proper and workman like manner and compliance with good oil field practice, (3) the continuing payment to Niko in violation of the injunction of writ petition no. 6911 filed by BELA and (4) the act and omission of Petrobangla and BAPEX in two arbitration before the International Centre for Settlement of Investment Dispute (ICSID) with an intention to provide undue advantage to Niko and against the public interest of Bangladesh.

A bench of the justice Naima Haider and justice Abu Taher Md. Saifur Rahman held that it was alleged by the petitioner that the NIKO Bangladesh was the least qualified bidder both technically and financially among the seven bidders that participated in that bidding round.⁷⁸⁶ The petitioner alleged that though the Chatak East field was considered a virgin gas field according to the study carried out by the Niko Bangladesh Ltd. under the financing of the Canadian International Development Agency, it was declared abandoned without any further study. It was an exploration targeted field according to the report of 2000 but subsequently was declared as the marginal or the abandoned gas field.⁷⁸⁷ The blowout held in the Tengratilla gas field of Chatak 2 on January 07, 2005 continued for one week. The consequence of the blowout caused the villagers to leave the place and a school was not usable.⁷⁸⁸ The second blowout occurred on June 24, 2005. These two massive blowouts caused extensive damage to the gas field, environment and the health of the local people. As a compensation for the blowouts, the Niko Canada, agreed to pay 94,99,0000.00 Canadian dollars. However, it was acknowledged by Niko Resources Ltd. that they agreed to pay with a view to influencing the then Energy Minister about GPSA as well as to ensure the fairness of the company but still now no compensation is paid for the damage.⁷⁸⁹ Moreover, violating the interim order dated May 09, 2016 the subsidiary of the Niko Bangladesh continued the petroleum operation.⁷⁹⁰ It was acknowledged by the then Country President of Niko Bangladesh Ltd., that the bribe was given to the then State Minister for Energy and Mineral Resources Division during the petroleum operation by that company in Bangladesh.⁷⁹¹ In a plea bargain in the Canadian Crown Prosecution, it is also admitted that ‘Niko Canada directly and indirectly provided improper advantages to Bangladeshi public official in order to further the business objectives of Niko Canada and its subsidiaries’.

⁷⁸⁶ Paragraph 4 of the judgment of the writ petition No. 5673 of 2016, High Court Division, Supreme Court of Bangladesh.

⁷⁸⁷ Ibid. Para 5.

⁷⁸⁸ Ibid. Para 10.

⁷⁸⁹ Ibid.

⁷⁹⁰ Ibid. Para 11.

⁷⁹¹ Ibid. Para 10.

Without paying any compensation, Niko Bangladesh was able to conduct the GPSA on December 27, 2006 through corruption and filed two arbitration cases to ICSID against Petrobangla and BAPEX for the payment of gas supplied from Feni gas field. Declaration also seeks for the non-liability of Niko Bangladesh for the blowouts happened in Tengratilla. The number of arbitration cases were arb/10/11 and arb/10/18. It is noticed that the counsel of the Petrobangla and of BAPEX did not submit any proof of corruption before the ICSID, which is against the public interest of Bangladesh with an intention to provide undue advantages to the Niko Resources Bangladesh Ltd.⁷⁹²

Another matter of significance is that Niko Canada has continued to receive payment from block 9 and owns 60% interest operated through Tullow Bangladesh Ltd. in violation of the injunction order of the court though compensation was not paid for the previous blowouts.⁷⁹³ It has been proved that the JVA and the GPSA were conducted through bribery and corruption. It has been shown in the report of investigation conducted jointly by the Royal Canadian Mounted Police (RCMP), Federal Bureau of Investigation (FBI) of America and Anti Corruption Commission (ACC) of Bangladesh.⁷⁹⁴ It was also argued by the Attorney General, Mahbubey Alam, that payment was also made to the then Minister of Law, Justice and Parliamentary Affairs, who beside being a Minister was working as an adviser to the Niko Bangladesh Ltd at the same time and opined that Chatak East was an abandoned filed upon which the JVA was signed.⁷⁹⁵ It proves that the conflict of interest has occurred in that contract.

It was also decided by the court that “it is clear and admitted in the agreed statement that Niko Canada (respondent no. 5) made the payment to the Bangladeshi State Minister of energy to exercise his influence to ensure that the respondent no.4 (Niko Bangladesh) was able to secure a Gas Purchase and Sale Agreement (GPSA) acceptable to Niko as well as to show that Niko was dealt fairly in relation to claims of compensation for blowouts”.⁷⁹⁶ It is worth mentioning here that following the declaration of payment, the GPSA was signed in 2006 after the blowouts. Furthermore, the judgment uttered that “there is no need to show as the respondent no.4 argues that the bribe paid to the then state minister actually influenced his decision to act in favour of Niko”.⁷⁹⁷ Thereafter, the court held that the two blowouts caused

⁷⁹² Writ petition number 5673 of 2016 para 16 and 17

⁷⁹³ Ibid., Para 18

⁷⁹⁴ Ibid Para 23

⁷⁹⁵ Ibid Para 27.

⁷⁹⁶ Ibid Para 60.

⁷⁹⁷ Ibid., 61.

damage of more than 1 billion US dollars for which Niko Resources Bangladesh and Niko Resources Ltd. had not yet paid.

The court observed that the respondent no.5, that is Niko Resources Ltd., should be deprived of its resources in Bangladesh acquired through corruption and bribery. The decision was guided by the provision of article 31 on the United Nations Convention on Anti Corruption (UNCAC). Therefore, all their assets in Bangladesh derived directly and indirectly from the JVA, GPSA and under block 9 are subject to seizure and confiscation.⁷⁹⁸ The assets of Niko Canada and its subsidiaries acquired from 2003 to 2006 are treated as the output of corruption which will be attached and seized and be vested on the State to retribute the damage.

It was also alleged by the petitioner that another consultancy agreement was held between the respondent no. 4 and a consultancy firm *Nationwide*, owned by Bangladeshi national Mr. Salim Bhuiyan and it was admitted by Niko Resources Ltd. that the services provided by this firm was to obtain and arrange meeting with particular personnel of Petrobangla, BAPEX and Ministry of Energy and to gain favour of the politically influential persons.⁷⁹⁹

The court held that “The consultancy contract is the clear evidence that a corrupt scheme was set up by which regular payment were being made by respondent no. 5 to Bangladeshi officials and politically influenced people for the business benefits of its subsidiaries in Bangladesh.”⁸⁰⁰ The court also declared that the Government exercising *ultra vires* authority does not have any legal effect and any resultant contract procured through illegal means such as corruption is void.⁸⁰¹

The Ministry of Power, Energy and Mineral Resources , Petrobangla and BAPEX were directed to claim adequate compensation for the 2005 blowouts and to ensure recover any proceeds of crime back that have already been taken away out of Bangladesh by Niko Resources Bangladesh Ltd. and Niko Resources Ltd..⁸⁰²

The court also directed the ministry to cancel all the exploration rights that were obtained during the period of 2003 to 2006 through corrupt means and to develop these

⁷⁹⁸Writ petition number 5673 of 2016,.Para 78

⁷⁹⁹ Ibid para 8 and 9

⁸⁰⁰ Ibid. Para 79.

⁸⁰¹ Ibid. Para 84 .

⁸⁰² Ibid. Para 87.

fields either by themselves (through national oil company) or by another competent company through a fair, transparent and competitive open bidding method.⁸⁰³

From the above observations, the court came to the conclusion that the JVA signed between Niko Resources Bangladesh and BAPEX on October 16, 2003 for the development and production from Chattak and Feni abandoned fields, and the GPSA conducted between Petrobangla and Niko Bangladesh Ltd. and BAPEX on December 27, 2006 were obtained through corruption and rendered as *void ab initio*. The court also concluded that the rights and assets of Niko Resources Ltd. and Niko Resources Bangladesh, including their shareholding in Tullow Bangladesh Ltd., acquired from the PSC of block 9 for which Niko Resources Ltd. was the least qualified bidder in 1997, were also gained through corrupt practices and they were to be seized as the proceeds of crime and to provide the compensation for the 2005 blowouts.⁸⁰⁴

From the above discussion, it is seen that though several blowouts have occurred in Bangladesh during the petroleum operation in no case the compensation is realised. On the contrary the operating companies obtained undue advantages even after the blowouts in spite of their liability and negligence behind such blowouts. The role of the regulating authority and its associates involved is surprising. The court had to direct the authority to claim their damage. This is the situation of the country having weak framework and inefficient control over the operating companies operating in the country. On the contrary, following the blowouts in the Gulf of Mexico in April 2010, more than hundreds of suits were filed in the Federal and State Court of America by the early December of 2010 and the Government of USA conducted investigation both for the civil and criminal involvement of the operating companies.⁸⁰⁵ The criminal investigation was held to find out whether there was any unjustified relation between the corporate officials and the federal regulator that led to the accident and the breaches of environmental law.⁸⁰⁶ The civil suit was filed by the Justice Department of USA against the British Petroleum (BP), Anadarko, Transocean, MOEX (part of Mitsui Oil Exploration) and the insurer of the rig QBE Underwriting /Lloyd's Syndicate 1036 (part of Lloyds of London) on 15 December 2010. A ruling was issued in Federal Multidistrict Litigation Proceedings where the BP was found guilty for gross negligence and

⁸⁰³Writ petition number 5673 of 2016. Para 88.

⁸⁰⁴ Ibid. Para 88-90.

⁸⁰⁵Lawsuits, "US Deepwater Horizon Explosion & Oil Spill Lawsuits," Business and Human Rights Resource Centre, April 25, 2010. <https://www.business-humanrights.org/en/us-deepwater-horizon-explosion-oil-spill-lawsuits> accessed on May 25, 2020.

⁸⁰⁶Ibid.

willful misconduct.⁸⁰⁷ Finally, the claim of the Federal Government and State Government against BP was dissolved for an amount of more than 20 billion US dollars of which 7.1 billion for the damage of natural resources claim under the Oil Pollution Act, 5.5 billion for the violation of Clean Water Act, 4.9 billion for five Gulf of Mexico States, 1 billion that is already paid for the restoration work and up to 1 billion to the Local Government.⁸⁰⁸ Before the settlement of dispute, BP also agreed to plead guilty for 14 criminal charges brought against it and agreed to pay an amount of 1.26 billion US dollar to the Department of Justice as penalty. It is noticed that before that settlement of the dispute BP had to pay an amount of 1 billion for restoration work.

On the other hand, in Bangladesh, two massive blowouts, one in 1997 at Magurchara and another in 2005 at Tengratilla occurred, but no compensation is paid yet by the liable companies. In the USA more than hundreds of suits were filed by Federal government, State Government and the individuals for the compensation for their sufferings that resulted from the blowout; but in Bangladesh the individuals are not aware of their rights while the provision of BECA 1995 also creates obstacles to file suit by individuals for their sufferings for environmental derogation resulting from the blowout. Some corrupt government officials also tried to act in favor the operating companies who are responsible for the loss of billions for the country. These instances raise the issue of the weakness in the existing legal and regulatory framework of the country, where it is possible to abandon a gas field without proper field study and the Minister of the Law, Justice and Parliamentary Affairs also works as a consultant to an IOC while holding office. However, two or three civil suits were filed by the Government, NGOs and individuals for the blowout but no information regarding criminal cases filed against those companies for the violation of environmental laws of the country is available.

These multinational corporations play controversial role both in home and host states because of their economic and political influence and the complex nature of their operation.⁸⁰⁹ The role of the regulating authority of the host country is also liable in continuing the environmental degradation by these companies as the host countries propose lowest possible environmental protection laws to attract the investment.⁸¹⁰ In Bangladesh the protection of the environment and the standard of operation are left to the company according

⁸⁰⁷Lawsuits, "US Deepwater Horizon Explosion & Oil Spill Lawsuits,"

⁸⁰⁸Chappell, "U.S. Settles Claims Against BP Over Deepwater Horizon Spill For \$20 Billion"

⁸⁰⁹ Afrin, "Foreign Direct Investments"

⁸¹⁰Ibid

to good international oil field practice without any specification. It creates a room for the company to comply according to their wishes as there is no specific guideline. Whereas the Government of India prepared Good International Petroleum Industry Practice(GIPIP) prescribing sector wise standard and best practice under the heading of exploration, discovery, appraisal, declaration of commerciality, field development, production, testing and analysis–reservoir and production, health, safety, environment(HSE), procurement procedure and others.⁸¹¹ The operating companies have to follow these standards at every phase of the operation while operating in India. However, in Bangladesh such standard is not prescribed till now though several devastating blowouts happened due to the failure to conduct the operation according to expected standard under good international oil field practice. This creates opportunity for the operating companies to deny its liability of compliance.

4.3.2.3 Abandonment

In the first MPSC of 1988, there is no provision regarding the abandonment of the operation, though it is one of the prior conditions of sustainable petroleum operation. It is well established that without sound abandonment of the petroleum operation it is not possible to restore the area to its earlier form. Environmental aspect was not prioritised in this MPSC.

The MPSC of 1988 was updated in 1997 after the enactment of the Bangladesh Environment Conservation Act 1995. Definition of abandonment and abandonment cost are not mentioned in this MPSC. This MPSC also does not include any provision regarding the abandonment and restoration of the operating area.

The definition of abandonment and abandonment cost appeared for the first time in the MPSC of 2008. In it, there is a separate chapter concerning the abandonment of the facilities and others utilities after the termination of the contract or at any time of the operation when it is necessary.⁸¹² It specifies that the contractor must comply with the law of Bangladesh and in case of absence of such law, the abandonment obligation will be discharged according to good and modern international practice.⁸¹³ This part describes in detail the abandonment plan, abandonment cost which is subject to cost recovery, and creation of an abandonment fund. The contractor is under an obligation to make payment into the abandonment fund in the first anniversary of the commercial production.⁸¹⁴ It is mentioned in this MPSC that if the contract is terminated early, the contractor has to pay in

⁸¹¹ Good International Petroleum Industry Practices.

⁸¹² Model Product Sharing Contract, 2008, art. 34.

⁸¹³ Ibid., art. 34.1.

⁸¹⁴ Model Product Sharing Contract, 2008, art. 34.4.1.

the abandonment fund within three months before the termination of the contract,⁸¹⁵ and in case of failure to make payment in the abandonment fund, Petrobangla reserves the right to terminate the contract.⁸¹⁶

In case of failure to comply with the abandonment provision, the liability of the contractor extends even after the termination of the contract for any cost, damage, claim and expenses.⁸¹⁷ However, mechanism is not prescribed to ensure the accountability of the operator after the termination of the contract as at that time the operator will no longer be present in the country. It is evident from the Magurchara and Tengratilla blowouts that even when the operating companies are within the national jurisdiction they can escape their liability for the huge environmental disaster. The onshore MPSC of 2019, includes a new provision regarding the abandonment that the proposal of abandonment plan and site restoration are required to be submitted before the Joint Management Committee.⁸¹⁸ This concept is compatible with the idea of sustainable natural gas operation.

Consideration was also given to minimise the gas wastage and to ensure the optimum recovery,⁸¹⁹ which is one of the primary conditions of sustainable petroleum operation. As petroleum is a non-renewable resource, its sustainability can be ensured through maximum recovery without leaving it under the ground.

4.3.3 Employment, Training and Transfer of Technology

Employment of nationals is one of the important phenomena to ensure the sustainable natural gas development. In article 10.13 of the MPSC of 1988 a provision to maximise the number of those nationals qualified and experienced in petroleum operation is added, but no provision of technology transfer is there. In article 24, provisions are added to arrange a planned, systematic and phased manner training of Bangladeshi personnel to improve the skill and knowledge in all aspects of petroleum operation and the cost is subject to cost recovery.

In both the contracts A and B, it is noticed that though the contractor is under an obligation to conduct the training programme of Bangladeshi personnel in all aspects of petroleum operation, the actual contract replaces the phrase “Bangladeshi personnel” by “contractor’s People’s Republic of Bangladesh personnel” that the Bangladeshi nationals who are the appointee of the contractor.⁸²⁰ At that period, the petroleum operation was at the

⁸¹⁵Model Product Sharing Contract, 2008, art. 34.4.2.

⁸¹⁶Ibid., art. 34.4.4.

⁸¹⁷Ibid., art. 34.2.1.

⁸¹⁸Onshore Model Production Sharing Contract 2019, art. 12.2.5.

⁸¹⁹Ibid., art.8.11(k & n).

⁸²⁰Article 24.1 of Contract B

beginning stage in Bangladesh, and it was not expected that any Bangladeshi person would be employed at the higher posts of the company. Training only the employee of the contractor may not actually ensure the technology transfer aspect of the contract. Without the provision of transfer of technology, sustainable development of natural gas may not be possible. Similar to the MPSC of 1988, in the actual contracts A and B, there was provision of employment of foreign personnel without any condition.⁸²¹

In revised MPSC of 1997 employment of Bangladeshi nationals is specified with fixed proportion. For initial exploration period it is not below 20%, for extended exploration period not below 50%, in the production stage for first five years not below 60%, and for next five years not below 75%, and for a period over ten years not below 90%.⁸²² In this model contract, the provision of transfer of technology is inserted as an obligation of the contractor and to enhance the skill of Petrobangla personnel.⁸²³ It also clearly emphasises the involvement of the Petrobangla personnel in all sectors of the operation to make Petrobangla capable to conduct the exploration and production activities though all these are subject to cost recovery.

In the MPSC of 2008 a notable addition with the prior provision is the written approval of Petrobangla in case of appointing any expatriate at various responsible posts.⁸²⁴ The special requirement for appointing Bangladeshi personnel is included and it is said that the expatriate will be appointed where it is not possible to fulfill the position by the nationals. Training in abroad is also approved for Bangladeshi personnel.

In the MPSC of 2012 it is stated that “To the extent practicable, contractor shall engage personnel from Petrobangla on secondment in all major Petroleum Operations with a view to impart transfer of technology. Petrobangla and Contractor shall mutually determine the number, discipline and tenure of secondment”. This provision of transfer of technology is not included in the draft contract C.⁸²⁵ It is very crucial, as in the case of onshore petroleum operation, BAPEX is now able to explore and the other two production companies along with BAPEX conduct the production. However, in case of offshore petroleum operation, the transfer of technology is very significant to make the national companies self-sufficient but such a provision is absent in the draft contract. Though the traditional provision of transfer of technology is incorporated in article 24 of this contract similar to the MPSC of 2012, the

⁸²¹ Article 9.3 of contract B.

⁸²² Model Product Sharing Contract 1997, art. 10.13.

⁸²³ Ibid., art. 24.1..

⁸²⁴ Model Production Sharing Contract 2008, art. 10.13.

⁸²⁵ Model Production Sharing Contract 2012, art.10.29(b).

provision to participate as secondment is absent in contract C. Article 25 of the onshore MPSC 2019 incorporates a new provision of prohibiting the training of the expatriate personnel.⁸²⁶

4.3.4 Confidentiality

Article 25 of MPSC of 1988 provides the provision of confidentiality as only the authorised representatives and employees have the full and complete access to the recorded data and assets of the petroleum operation. Access to information by public is ignored here. Article 25.1 states that contractor shall prepare and maintain the data and information of operation during contract period in conformity with law or requirement of BOGMC and submit them to BOGMC. In fact, there was no authority except BOGMC to examine the compliance as nobody but the appointee of BOGMC had access. In this regard, the law and interest of the country are of prior importance and the public could have had access to the said data and information without unreasonable restriction. Article 26.7 provides the right to disclose the information to its employees, affiliates, consultants, sub-contractors or others to the extent necessary to conduct petroleum operation efficiently. However, there is no provision to disclose the information to the public. The people of the operating area are well aware of the region, however no provision is found in the MPSCs of 1988 and 1997 about consulting the inhabitants of that area. Article 25.7 of the MPSC of 1997 includes the term ‘others’ which does not make clear sense whether the stakeholders or the inhabitants of the area will be within the ambit of ‘others’. It is evident from the statement that other persons to whom the information is to be disclosed are directly participating in the operation of the natural gas, but the inhabitants of the very region where the operation will take place are not in the same rank of others. It is clear from article 25.10 that the public are excluded from the domain of ‘others’ as it states that without prior approval of the Petrobangla the contractor is not allowed to announce or make statement of any data or information in public. Actually, in this MPSC, the opportunity of public participation in the decision making process as well as to share their experience with the decision makers regarding the regional environment as well as the biological diversity of that area is restricted. Article 25.9 implies that all data and information are strictly confidential for a period of 8 years even after the termination of contract.

Like the previous MPSC of 1988, the MPSC of 1997 also does not permit the access to information, however, the duration of confidentiality is decreased from eight years to five

⁸²⁶ Onshore Model Production Sharing Contract 2019, art.25.2(b).

years. In the MPSC of 2008, the same provision remains regarding the confidentiality. The confidentiality clause continues even in the latest revised onshore MPSC of 2019 and it may create an obstacle to ensure the transparency of Petrobangla and the IOCs.

Article 23 of this contract deals with the matter of audit of the accounting procedures as well as the profit and loss of the contractor. Petrobangla is authorised to audit and inspect the compliance with the financial terms and conditions by the operating company.⁸²⁷ However, no provision of audit by the government audit department is included to ensure the transparency of expenditure of the IOCs. Even audit report is not published in public which could have assured the transparency of Petrobangla and the contractor.

4.3.5 Cost Recovery

In MPSC of 1988 the percentage of cost recovery is subject to negotiation and is limited within maximum 50%.⁸²⁸ The contractor has to assure that it has the financial and technical capacity to carry out the exploration, development and other petroleum operation⁸²⁹ However, article 9.5 of both the contracts A and B present a different scenario in that aspect. It is stated in both the contracts that in case of borrowing money from intercompany or any third party, 50% of the interest is subject to cost recovery. There is no such provision regarding the cost recovery of loan in the MPSC of 1988, according to which the contracts are signed, but both the contracts include such provisions. Article 9.5 of contracts A and B makes one think that Petrobangla's role in incorporating such terms and conditions should have been wiser. The last paragraph of the same article mentions the provision that "Petrobangla shall not unreasonably withhold the loan agreement." The term "unreasonable" is an unclear term, which may vary from person to person and from time to time. It may create undue pressure on Petrobangla to approve the loan agreement within the soonest possible time.

Some deviations are also found in the case of cost recovery where the MPSC allows 10% cost recovery for pre commercial expenses per calendar year but both the contracts have fixed it at the rate of 25% per calendar year.⁸³⁰ The audit and adjustment provision ensures the inspection of the cost submitted by the contractor, though the duration for raising objection in case of expenses is reduced from 2 years to 1 year and in the instance

⁸²⁷Model Product Sharing Contract 2012, art.23.6.

⁸²⁸Model Product Sharing Contract 1988, art. 13.3.

⁸²⁹Ibid., pmb1.

⁸³⁰Article 13.4 (d) of Contract A.

of cost recovery, the duration is reduced from six months to 3 months.⁸³¹ It is noticeable that the time limit in the contract varies from that mentioned in the MPSC of 1988. Petrobangla should have been more prudent in determining the time limits while negotiating with the operators.

In case of the contractor's failure to make payment or fulfill the obligation under the contract or comply with the arbitration award or to declare the commercial discovery within the time limit by the contractor, the Government has the right to terminate the contract and to take all kinds of property situated onshore or offshore of Bangladesh.⁸³² But both the contracts A and B have added a new condition that "the right of Government is applicable regarding only those properties, which are subject to cost recovery."⁸³³ It provides the contractor with an opportunity to escape without completing the obligation required by the contract, as they are subject to lose only those property which are subject to cost recovery. According to the contracts, handing over the title of immovable, fixed and movable property to Petrobangla is possible after the approval of cost recovery, though the MPSC of 1988 claims it to be after "completion of purchase".⁸³⁴ Compared to Petrobangla, the contractors were more conscious about protecting their interest.

Therefore, Article 25.7 of contracts A and B was included as an additional provision that the cost of maintaining the data and records of petroleum operation is subject to cost recovery though there was no such provision in the MPSC of 1988.

In MPSC of 1997, the cost recovery was subject to negotiation to maximum 50% and 55% respectively for oil and natural gas.⁸³⁵ In the MPSC of 2008 the same provision of MPSC of 1997 is continued and cost recovery was up to 55% per calendar year for all kind of petroleum. In this MPSC, gas blocks were separated as offshore and onshore blocks, but no different provision was introduced as to the cost recovery for offshore and onshore petroleum operations. In case of pre commercial cost recovery, in the MPSC of 1997 it is 10% per calendar year whereas in 2008 it is revised as 25%. It is noticed that the pre commercial cost recovery has deviated from 10% to 25% in both the contracts A and B which was finally inserted in the revised MPSC of 2008.

In the MPSC 2012, separate rate of cost recovery is recognised as for the onshore up to 55% but in case of offshore it is up to 70% per calendar year. In the MPSC of 1988, there

⁸³¹Model Production Sharing Contract 1988, art 13 of annex B.

⁸³²Ibid., art 27.1.

⁸³³Article 24.1 of Contract B.

⁸³⁴Model Production Sharing Contract 1988, art 20.1.

⁸³⁵Model Product Sharing Contract 1997, art. 13.3.

is no provision regarding the interest of the loan and the MPSC of 1997 states that the interest of loan at development and appraisal stage is not subject to cost recovery⁸³⁶, but the MPSC of 2008 clearly states that if the amount of loan does not exceed 50% of the development cost, the full interest is cost recoverable but if it exceeds 50%, then 50% interest will be cost recoverable.⁸³⁷ This provision continues till now in the latest onshore MPSC of 2019.

4.3.6 Codes of conduct

Article 10 of MPSC 1988 states that the petroleum operation should be conducted in a diligent, conscientious and workman like manner. These terms are very vague and in fact do not impose any explicit obligation. Provisions have been also made to follow the international standard of petroleum industry for safe and efficient operation and to ensure the ultimate economic recovery from the contract area.⁸³⁸ This term is to some extent related to the concept of sustainable development, as the ultimate economic recovery is only possible when the maximum recovery of petroleum is possible. As the concept of sustainable development was in developing stage at that time, no provisions were added in development plan to minimise the waste and maximising the recovery of petroleum. In contract A and B it is mentioned that in case of bearing loss and damages caused by negligence or wrongful act on the contractor's side, the contractor will indemnify to Government or Petrobangla in accordance with applicable laws. It is not made clear whether the applicable laws are the domestic laws of the host country or international laws or the laws followed by the contractor.

Article 9 of the revised MPSC of 1997 incorporates that the operation of petroleum and production from the field will be consistent with sound international petroleum industry practices and good conservation economic practices.⁸³⁹ Article 10.4 adds the provisions of prevention of waste and loss of petroleum above and under the surface, which is very much consistent with the concept of sustainable development. The contractor is permitted to produce annually 7.5% of the proven recoverable reserve of every gas field according to good reservoir management practice but the standard of the term "proven" is not defined.⁸⁴⁰ Later, in the revision of 2008, the standard of proven recoverable reserve has been stipulated as approved and defined by the Society of Petroleum Engineers and the World Petroleum Congress in 1997 or as subsequently amended. This MPSC also allows to produce even

⁸³⁶Model Production Sharing Contract 1997art.2(n) of annex B.

⁸³⁷Model Production Sharing Contract 2008, art.3(n) of annex B.

⁸³⁸Model Product Sharing Contract 1988art. 10.4.

⁸³⁹Model Production Sharing Contract 1997art. 9.6 and 9.7.

⁸⁴⁰Ibid.art. 14.5.

greater than the 7.5% in case of offshore if agreed between Petrobangla and the contractor. In the MPSC of 2012 this provision has become applicable to both offshore and onshore production and the term 'proven' has been replaced with 'proven and probable' reserve. The proven reserve is almost certain but the certainty of probable reserve is 50%.⁸⁴¹ As it is not recoverable with reasonable certainty, so the production on the basis of probable reserve may not be sustainable for the gas field. It may cause harm to the reservoir and result in quick depletion. The onshore MPSC of 2019 also continues the same provision. The matter of significance is that there is no provision to determine the amount of maximum recovery per day, which is very essential, as there is a relation between the rate of recovery and the maximum recovery of the gas field.⁸⁴² In most of the cases petroleum reservoirs have maximum efficient rate of recovery, if it is exceeded, a significant amount of petroleum may be left behind underground. For example, in the USA, in an oil field, 95% of the oil was left in the reservoir due to uncontrolled and competitive drilling and production.⁸⁴³ In Bangladesh at present the production rate from the Bibiyana, the largest gas field is 11.66%, higher than the specified amount of production per day that ultimately may lead to destruction of the field.⁸⁴⁴ Actually the provision of 7.5% yearly production of the 'initial natural gas in place' was included in contract B of 1994⁸⁴⁵. It was inserted in the MPSC of 1997 as 'proven natural gas'. The provision of increasing the production on consensus between Petrobangla and the contractor was also in contract B. Actually the IOCs are in a position to exceed the yearly maximum production so that they can recover the cost in soonest possible time.

The revised MPSC of 2008 comprises the same provision like the MPSC of 1988 and 1997 about the codes of conduct. In this MPSC also Article 10.4 describes the obligation of the contractor using similar vague terms: Conduct all Petroleum Operations in a diligent, conscientious and workmanlike manner, in accordance with the applicable laws and this Contract, and generally accepted standards of the international Petroleum industry.⁸⁴⁶

⁸⁴¹ Proven reserves are those quantities of petroleum which, by analysis of geological and engineering data, can be estimated with reasonable certainty to be commercially recoverable, from a given date forward, from known reservoirs and under current economic conditions, operating methods, and government regulations. Probable reserves are those unproved reserves which analysis of geological and engineering data suggests are more likely than not to be recoverable. In this context, when probabilistic methods are used, there should be at least a 50% probability that the quantities actually recovered will equal or exceed the sum of estimated proved plus probable reserves. Gang Lu et al., *Gas Sector Master Plan 2013*, 3.

⁸⁴² Weaver, "Sustainable Development in the Petroleum Sector," 45-77.

⁸⁴³ Ibid.

⁸⁴⁴ M. Azizur Rahman, "Bibiyana Gas-Field Overproducing Due to 'Govt Pressure,'" *The Financial Express*, August 07, 2018.

⁸⁴⁵ Article 14.5 of Contract B.

⁸⁴⁶ Model Production Sharing Contract, 2008 art. 10.4.

However, there is no universal standard of the petroleum industry and it varies from company to company and country to country.⁸⁴⁷ In this case, it is very difficult to bring the contractor within the obligation as they are not clear about their responsibility with which they have to comply. The environmental obligation of the oil producing companies are comprised in article 10.6 of the MPSC of 2008 which states that companies will comply with the good international petroleum industry practice for the protection and preservation of the environment. There are variations among oil and gas producing countries in referring to specific environmental regulation. While some countries refer to the domestic law, others refer to the international industry law and in some cases some countries refer to combination of both. To a very limited extent, some countries refer the international environmental law.⁸⁴⁸ Bangladesh applies only the good international petroleum industry practice, which is not clear in absence of specific well-recognised good petroleum industry practice accepted by the IOCs. As a result, the environmental consideration is completely left to the well wishes of the petroleum producing companies. For example, in Nigeria the Nigerian Mineral Oil (Safety) Regulation states that where there is no specific provision, the drilling, production and any other operation related to petroleum production and subsequent handling shall comply with good oil field practice. For this regulation the good oil field practice will be properly covered by the appropriate current Institute of Petroleum Safety Codes, the American Petroleum Institute's Codes or the American Society of Mechanical Engineers Codes.⁸⁴⁹

Article 29 of the MPSC of 2008, states that the validity, interpretation and implementation of this contract shall be governed by the law of The People's Republic of Bangladesh. Conflict may arise due to the fact that different provisions of the MPSC have used the terms 'good and modern oil and gas field practice' (sec 10.24), 'good petroleum industry practice' (sec 10.6), 'standard of the international petroleum industry' (sec 10.4). The confusion may arise, when the international oil field standard or practice is inconsistent with the domestic law, which one will prevail, as there is no clarification in this regard. However, article 10.25 states that Petrobangla and the contractor regularly will consult on the good oil field practice. Petrobangla emphasised on the maximum ultimate recovery of the

⁸⁴⁷Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector," 15-20, 39-40.

⁸⁴⁸Ibid.

⁸⁴⁹Eghosa Osa Ekhaton, "Public Regulation of the Oil and Gas Industry in Nigeria: An Evaluation," *Annual Survey of International & Comparative Law*: 21, no. 1 (2016). <http://digitalcommons.law.ggu.edu/anlsurvey/vol21/iss1/6> accessed on April 8, 2020.

petroleum resources in order to ensure the national interest.⁸⁵⁰ It is compatible with the concept of sustainable development to some extent as the researcher thinks that the maximum recovery is one of the preconditions for sustainable natural gas extraction.

MPSC of 2012 emphasises the protection and preservation of the environment and where environmental pollution is inevitable, and obligates the contractor to minimise the impact on the property and people, and in this case the contractor shall follow the modern oilfield and petroleum industry standard,⁸⁵¹ but article 10.3 of this MPSC states about the compliance with The Bangladesh Environment Conservation Act 1995 and The Environment Conservation Rules 1997. No specific guideline is provided in case of any contradiction raised. Later in article 36.2(iii) it is stated that the contractor has to comply with the reasonable and applicable law of the Government and article 29 states that the contract will be interpreted according to the law of the People's Republic of Bangladesh.

4.3.7 Bonuses and Fees

In the MPSC of 1988 the provision of administering fees and discovery bonus was payable to the then BOGMC within 30 days from the date of effectiveness and after the date of discovery respectively. This administering fee is abolished in the revised MPSC of 1997.⁸⁵² Provision was also included in the MPSC of 1988 regarding the additional production bonus if the production reached a certain level per day for a period of 30 days.⁸⁵³ In actual contracts A and B the term was deviated as it states that the bonus will be available if the production reaches a certain level and is sustained for a period of 180 days.⁸⁵⁴ The provision is changed in the contract so that Petrobangla does not get any bonus easily, because the continuation of production at rate of same amount for a period of six months is difficult compared to one month. However, surprisingly, the regulating authority agreed with the term ignoring as the possibility that the extraction of a large amount of petroleum over a long period of time may not sustainable. Moreover, in this case maximum recovery may also not be possible and a large amount of petroleum may remain left in the reservoir in abandoned form. It is a great hindrance in the way of sustainable petroleum operation in Bangladesh.

Some new provisions, that were absent in the MPSC of 1988, were incorporated in contracts A and B. In article 14.7.3 of the actual contract it is incorporated that the contractor

⁸⁵⁰Model Production Sharing Contract 2008, art. 33.1 and Model Product Sharing Contract 2012, art. 34.1.

⁸⁵¹Model Production Sharing Contract 2012, art. 36.1 and 36.2.

⁸⁵²Model Production Sharing Contract 1988, art.19.1 and 19.2.

⁸⁵³Ibid. art. 19.3.

⁸⁵⁴Ibid.,art 19.

will pay 4% of contractor's total natural gas measured at the measurement point to the transmission company. Article 14.7.6 also states that if the policy of the Government regarding price and/or payment terms is changed in favour of the contractor, then the contractor will be entitled for that. But what will happen if it is not favourable for the contractor, is not described.

However both the MPSCs of 1988 and 1997 comprise the provision that an amount of one hundred thousand USD which is payable by the contractor to Petrobangla per contract year for its own (Petrobangla) training programme is not subject to cost recovery. The amount is increased with the revision of the MPSC and continued in the latest revised MPSC of 2019. After scrutinising the pros and cons of these contracts it is found that the environmental, social and full economic interests of the country are not adequately protected.

4.4 COMPARISON AMONG THE MODEL PRODUCTION SHARING CONTRACTS OF BANGLADESH

Comparison among the model production sharing contracts of Bangladesh is presented in Table 4.3.

Table 4.3 Comparison among the model production sharing contracts in Bangladesh

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
Definition of abandonment and abandonment cost	Not included	Not included	Included	Included	Included
Reference of Petroleum Act 1974	No reference of the petroleum Act 1974 is inserted here.	Reference of the petroleum Act 1974 is inserted here as amended up to date if the amendment is in favour of the contractor.	Reference of the petroleum Act 1974 is inserted here but there is no provision of implementing the amendment under the favourable condition to the contractor.	Reference of the petroleum Act 1974 is inserted here without any additional provision	Same as the MPSC of 2012.
Initial contract period	3 contract years subject to extension. No maximum exploration period is fixed.	3 contract years subject to extension. No maximum exploration period is fixed	4 contract years for type A (onshore) block and 5 contract years for type B (offshore) blocks. No maximum exploration period is fixed here.	4 contract years for type A block and 5 contract years for type B blocks. Maximum exploration period for onshore is 7 years and for offshore is 8 years.	4 contract years. Maximum exploration period is 7 years.
Initial estimated amount for development of	At least 500Bcf	At least 500Bcf	At least 250 Bcf in the onshore and 125 for offshore.	No minimum amount is mentioned	No minimum amount is mentioned

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
market and infrastructure					
Production period, subject to extension	25 years for oil fields and 30 years for gas fields. With provision of 5 years extension.	20 years for oil fields and 25 years for gas fields. With provision of extension of 5 years.	20 years for oil fields and 25 years for gas fields with provision of extension of 5 years.	20 years for oil fields and 25 years for gas fields with provision of extension of 5 years.	20 years for oil fields and 25 years for gas fields with provision of extension of 10 years.
Time limit for relinquishment of all the portion of the contract area	Subject to extension within the end of 7 th contract year.	Subject to extension within the end of 7 th contract year.	Subject to extension for onshore within the end of 8 th contract year and for offshore within 9 th .	Subject to extension within the end of 7 th contract year for onshore and 8 th for offshore.	Subject to extension within the end of 7 th contract year for onshore
Prior condition of relinquishment fulfilled by the contractor	Shall take necessary action to prevent hazards to human life and property.	Shall take necessary action to prevent hazards to human life and property.	Shall take necessary action to prevent hazards to environment, human life and property.	Shall take necessary action to prevent hazards to environment, human life and property.	Shall take necessary action to prevent hazards to environment, human life and property.
Compositions of joint management committee (JMC) and their	With 6 members and no specific time.	With 8 members and no specific time.	With 8 members and specific time of 45 days.	No such provision of review by the JMC	No such provision of review by the JMC

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
time limit for reviewing the work programme and budget					
Emergency provision	Priority on life and property and economic aspect but not to environment.	Priority on life and property and economic aspect but not to environment.	No such emergency provision.	No such emergency provision.	No such emergency provision.
Content of development plan and evaluation report	The content of evaluation is very limited.	The content of evaluation is very limited.	The content of evaluation is detailed and includes number of issues with impact on the environment and its remedial measures.	Same as the MPSC of 2008.	Same as the MPSC of 2008.
Procurement procedure for purchasing equipments service, materials and others	Documents shall be submitted to the BGOMC if valuation is 30,000 US dollar or more.	Document shall be submitted to Petrobangla if valuation is 50,000 US dollar or more.	Document shall be submitted to Petrobangla but no valuation is specific here. However it must be consistent with annex B.	Same as the MPSC of 2008.	Same as the MPSC of 2008.
Recruitment of national	No specific requirement	For initial exploration	Prior provisions existed with some addition of	Same as the MPSC of 2008 with addition of	Same as the MPSC of 2012 with some

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
personnel		period not below 20% and in extended exploration period not below 50%, after production for first five years not below 60%, next five years not below 75% and after ten years not below 90%.	approval of Petrobagla in case of appointing any expatriate. Training provision of Bangladeshi national for various responsible post.	recruitment of Petrobagla personnel as secondment in case of offshore.	addition of prohibiting the training of expatriate personnel.
Insurance provision	No provisions of insurance	Insurance provisions covered loss and damages including that of third parties.	Same as the provision of MPSC 1997 with addition of cleaning up of pollutants, wreck and debris resulted from accident.	Same as the provision of MPSC 2008	Same as the provision of MPSC 2008
Environmental Impact Assessment	No provision	Provision was included	EIA, Initial Environmental Examination (IEE) and Environment Management Plan	Same as the MPSC of 2008	Same as the MPSC of 2008

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
			(EMP) required by Environmental Conservation Act of 1995 and Rules of 1997 are included.		
Provision of compensation	No provision of compensation	No provision of compensation	Provision of compensation, but blowout and environmental damages are not covered.	Provision of compensation was included for loss and blowout and environmental damages.	Same as the MPSC of 2012
Interest of loan	No provision regarding the interest of the loan	The interest of loan at development and appraisal stage is not subject to cost recovery.	If the amount of loan does not exceed 50% of the development cost the full interest is cost recoverable; but if it exceeds 50%, then 50% will be cost recoverable.	Same as the provision of 2008	Same as the provision of 2008
Guidelines for compensation	No guidelines	No guidelines	No guidelines.	Guidelines were incorporated	Guidelines were incorporated
Decision of the JMC	The decision of the JMC will be made by casting vote of the chairman	The decision of the JMC will be unanimous if failed then the secretary of the	The decision of the JMC will be unanimous if failed then the secretary of the ministry of Energy and	Along with the JMC there is also another body named JRC and the decision of the JMC will be unanimous if	Same as the provision of MPSC 2012.

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
		ministry of Energy and Mineral Resources will try to reach an unanimous decision.	Mineral Resources will try to reach an unanimous decision .	failed then the secretary of the Ministry of Energy and Mineral Resources will try to reach on unanimous decision.	
Work programme and budget	No separate chapter.	No separate chapter.	A separate chapter included.	Same as the provision of 2008.	Same as the provision of 2008.
Cost recovery	Cost recovery is subject to negotiation up to 50%.	In case of oil cost recovery is subject to negotiation up to 50% and in case of natural gas up to 55%.	Cost recovery is allowed up to 55% per calendar year.	Cost recovery is allowed up to 55% per calendar year in case of onshore and 70% in case of offshore.	Cost recovery is allowed up to 55% per calendar year.
Pre-commercial cost recovery	Fixed and movable assets, above ground installation are subject to cost recovery at the rate of 30% and	Pre-commercial cost is not fixed and subject to negotiation and there is no direction about the fixed and	Pre-commercial cost is recoverable at the rate of 25%.	Same as the provision of 2008.	Same as the provision of 2008.

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
	pre commercial cost at the rate of 10%.	movable assets.			
Administering fee	The administering fee was payable to BOGMC.	The provision of administering fee is abolished.	Same as the provision of 1997.	Same as the provision of 1997.	Same as the provision of 1997.
Discovery bonus	Discovery bonus was payable by the contractor subject to negotiation with BOGMC and not subject to cost recovery.	Same as the MPSC of 1988.	Discovery bonus was payable by the contractor to Petrobangla a fixed amount of 3 million dollar and not subject to cost recovery.	Same as the MPSC of 2008.	Same as the MPSC of 2008.
Contract service fee	Contract service fee was 1 million USD annually.	Contract service fee was same as the MPSC of 1988	Contract service fee was 2 million USD annually at the exploration and development stage and 3 million USD at production stage. Contractor's clear obligation was added here to transfer the	Same as the MPSC of 2008.	Same as the MPSC of 2008.

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
			technology.		
Provision of technology transfer	Absent	Present	Present	Present	Present
Amount payable for training	No fixed amount.	No fixed amount.	The amount was fixed during the exploration and development periods at USD 50,000 and in production period at USD 100,000.	The amount was fixed during the exploration and development stages at USD 50,000 and in production period at USD 100,000 for training purpose. In addition the contractor shall make a payment of USD 150,000 during the exploration and development period and USD 200,000 during the production period which is subject to cost recovery.	Same as the MPSC of 2012.
Assignment of rights, obligations and interest to its affiliated	Allowed both for BOGMC and contractor.	Allowed both for Petrobangla and contractor.	Same as the MPSC of 1997 and in case of changing the status of the assignee or replacing the position	Same as the MPSC of 2008.	Same as the MPSC of 2012.

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
company or enterprises.			of the contractor the approval of the government is required.		
Change the status of the company	No such provision.	No such provision.	Article 32.5 ensures the submission of terms and conditions and payment of all the assignment related taxes, stamp, duty, charges and other fees by the contractor.	There is separate chapter in Article 33 stating that taxes, stamp, duty, charges and other fees are borne by either the transferor or transferee.	Same as the provision of MPSC 2012
Unitisation	No provision	No provision.	Article 33 incorporated for unitisation, which ensures the maximum recovery from the field and avoid unnecessary drilling,	Same as the MPSC of 2008.	Same as the MPSC of 2008.
Abandonment clause	No provision	No provision	Article 34 included regarding the abandonment.	The same provision continued as earlier one in article 35	Same as MPSC of 2012
Environmental provision	No.	No.	No.	There is a separate chapter for the protection of the environment.	There is a separate chapter for the protection of the environment.

Subject	MPSC 1988	MPSC 1997	MPSC 2008	MPSC 2012	MPSC 2019
Division of gas block	No different provision for different blocks.	No different provision for different blocks.	There are different provisions for off shore and onshore blocks	There are different provisions for onshore, shallow sea blocks and deep sea blocks.	Separate MPSC is adopted for onshore and offshore.

4.5 CONCLUSION

MPSC is being updated from time to time considering the increasing demand for natural gas to attract foreign investment. It is well known that the petroleum operation requires a vast amount of investment; that is why the country has to depend on foreign investment to some extent. The MPSC is updated but the provision of sustainable operation is yet to be incorporated. The common provisions for conducting the operation in a workman like manner, good petroleum industry practices and international standard are used by the operating company. In such cases, the IOCs have the option to escape from their liability as terms are vague and the specific compliance requirement is not defined. In the MPSCs some provisions of environmental compliance are incorporated but the proper monitoring and reporting process is absent. One of the reasons behind this is that the MPSCs are updated without any policy guideline. The policy is not revised regularly to ensure the long term development of this sector.

Blowouts in Bangladesh have occurred in the petroleum operation run by the IOCs. When the IOCs work in a country of weak regulation, they operate recklessly and with old technology.¹ It also may be one of the reasons behind such kinds of blowouts. In case of Bangladesh, BAPEX, the national exploration and production company, has a record of no blowout in petroleum operation. BAPEX is conducting a number of petroleum operations, including exploration and production, as shown in Figure 4.2. All the operations are being conducted in a very sound way without any unexpected reported incident.

BAPEX participates at 10% carrying interest in joint venture agreement with the IOCs though in many cases, BAPEX conducts the drilling and survey on behalf of the IOCs. For example in 2014-15 fiscal year, BAPEX participated in international bidding round and with success signed a contract with Kris Energy to drill Bangura 6 and 7 wells. BAPEX has already completed the drilling of Bangura 6 without any unexpected incident.² Moreover, BAPEX have conducted 573 line kilometre, 60 fold 2D seismic survey for Tullow Bangladesh Ltd. in block 9 and 21 line kilometre, 40 fold 2D seismic survey for Unocal Bangladesh Ltd. in block 12.³ These examples clearly show the competency and potential of BAPEX in exploration activities. However, it is noticeable that though BAPEX is the

¹ Naama Hasson, "Deep Water Offshore Oil Exploration Regulation: The Need for a Global Environmental Regulation Regime," *Washington and Lee Journal of Energy, Climate, & Environment* 4(2013): 277-303.

² BAPEX, "Annual Report 2016" .

³Ibid.

national oil company and competent to work, it works as sub-contractor in its own country under the IOCs.

There is a need of initiatives for strengthening BAPEX further so that it can work independently and the petroleum activities can be conducted in a more sustainable way. To this end, the Government of Bangladesh has taken an initiative by forming Gas Development Fund Policy 2012. It was a significant initiative to develop BAPEX as a self-sufficient company.

In this regard, the Malaysian national petroleum company Petronas is an example of becoming self-sufficient both technologically and financially through unprecedented government steps. Petronas was established in 1974 under the Companies Act of Malaysia and the then Prime Minister was determined to run this organisation by ‘the sons of the soil’ (Malaysian citizen). At the very beginning, it was found that there were only five engineers in this sector and they were employed in administrative and military service of the country. To handle the situation, the company launched a major scholarship in this sector.⁴ The company adopted its goal as “to safeguard the sovereign rights of Malaysia and the legitimate rights and interests of Malaysians in the ownership and development of petroleum resources; to undertake proper planning for the orderly exploitation and utilisation of Malaysia’s petroleum resources so as to satisfy both present and future needs of the country”.⁵ It is noticeable that in 1974, the company adopted a sustainable development mission of the petroleum resources for the present and future needs. That guided the company to foresee a long term development plan of these resources. The Petroleum Development Act 1974 of Malaysia has provided exclusive ownership and control of Petronas over the hydrocarbon resources of Malaysia, and the role of the Government is a shareholder and dividends receiver. Moreover, there is no separate ministry for the petroleum resources and it is directly related to the Prime Minister’s office. As a result, within 16 years of establishment, Petronas entered into the overseas operation in 1990.⁶ Petronas is a reputed national petroleum producing company with goodwill and comparatively corruption free in administrative and financial accountability. In 2004, among 50 major petroleum companies, Petronas was ranked 19th in revenues, 7th in net income, 12th in total assets, 24th in oil output and 10th in gas output, 20th in

⁴ Fred R Von Der Mehden and Al Troner, “Petronas: A National Oil Company with International Vision,” NRGJ, The James A Baker III Institute for Public Policy, Rice University, (March 2007). <https://www.resourcedata.org/dataset/rgi-petronas-a-national-oil-company-with-an-international-vision/resource/17829b1b-fd94-45e2-b810-78aa9b3d6269> accessed on March 9, 2020.

⁵Ibid

⁶Mehden and Troner, “Petronas: A National Oil Company”.

liquid reserves and 11th in gas reserves.⁷ With the rapid growth of the petroleum activities, Malaysia has taken the environmental protection issues seriously and is recognised as one of the countries of mega biodiversity among the top 12. The country also has formulated a number of laws for the protection of rivers, conservation of forest and improving the air quality.⁸

BAPEX also conducts its operation in an environmentally friendly way as the conservation, management and improvement of the environment are the significant parts of the operation. To this end tree plantation project is implemented around the gas fields operated by BAPEX, waste management is strictly maintained and no occurrence of spillage of cement, mud, chemicals and explosive has taken place in 2015-2016.⁹ The income and expenditure of BAPEX is shown in its annual report to ensure its transparency,¹⁰ while no such information of the IOCs is available. Therefore, the actual contracts also remain confidential as no access to others is allowed without the permission of the parties concerned. It is also evident from the discussion of the above blowouts that controlling the IOCs is one of the difficult tasks, which is almost impossible. In this circumstance, the Government of Bangladesh may take initiative to support BAPEX financially and technologically to decrease the dependency on the IOCs.

Unfortunately despite the initiatives of the Government to strengthen BAPEX's capacity a few decisions taken by authority contradict with the vision of the Gas Developments Fund Policy. For example, the Bhola gas field was discovered by BAPEX but the contract was signed with Gazprom, a Russian oil company for production. Where the contract was signed for drilling three wells for an amount of TK 540 crore but Gazprom PE International oil company registered in Netherlands on behalf of Gazprom signed a contract with Eriell Oil to drill those wells for an amount of 408 crore. From the previous performance of BAPEX it can be estimated that BAPEX could drill those wells at the cost of 240 crore. A number of energy experts have expressed their concern to award the production contract to Gazprom as previous performance of the Gazprom has not been satisfactory and the service of BAPEX is better than that of Gazprom.¹¹ Proper cost benefit could have been

⁷Mehden and Troner, "Petronas: A National Oil Company".

⁸Naznin Tithi, "Striking a Balance between Development and Environment: Development without Environmental Protection cannot be Sustainable," *The Daily Star*, May 4, 2019.

⁹BAPEX, "Annual Report 2016".

¹⁰ *ibid.*

¹¹Md. Arifuzzaman, "Gazprom to Drill Bhola Gas Wells for Additional Tk 1.32b," November 22, 2020, <https://en.prothomalo.com/bangladesh/gazprom-to-drill-bhola-gas-wells-for-additional-tk-132b> and Dr.

analysed in such sensitive issues as the experts have opined that BAPEX is well equipped to extract the gas from Bhola.¹²

The Gas Development Fund was meant to increase financial incentives to BAPEX as the fund was mainly expected to accelerate its exploration and production activities. At the same time the initiatives should be taken to increase the technological capability. As BAPEX is operated by the nationals and in this case some extra advantages will be attained by the country if it becomes self-sufficient and well equipped like Petronas of Malaysia.

Natural gas is the main source of energy in Bangladesh and this sector should be governed transparently and the national environmental regulation should be specific and be complied with by the operating company. Though the Government of Bangladesh has enacted the Bangladesh Environment Conservation Act 1995 and Bangladesh Environment Conservation Rules in 1997, their implementation is not satisfactory yet to ensure the compliance of the multinational companies. The reason behind this is the lack of proper development of regulatory regime on environment and no separate environmental legislation is there to address the environmental crime by the corporation.¹³ The Government should take initiatives to take proper civil and criminal action without any influence to make those companies violating the domestic laws liable.

Moreover to prevent such kinds of unexpected situation the Government should formulate comprehensive guidelines to be complied by the companies during the operation instead of relying on the company to conduct according to good international oil field practices.

Badrul Imam, "Bapex is Fit to Extract Gas in Bhola," *The Business Standard*, January 22, 2020. <https://tbsnews.net/opinion/bapex-fit-extract-gas-bhola-38249#> accessed on February 10, 2020.

¹² Badrul Imam, "Bapex is Fit to Extract Gas in Bhola".

¹³ Faruque, *Environmental Law: Global and Bangladesh Context*, 206.

CHAPTER FIVE

COMPLIANCE WITH INTERNATIONAL ENVIRONMENTAL COMMITMENTS

The aim of this chapter is to examine the implementation of sustainable development concept in natural gas operation and to analyse the opinion of experts procured through interview to find out the compliance with the indexes of sustainable development of natural gas extraction in Bangladesh.

5.1 INTRODUCTION

Six indices were selected¹⁴ earlier in this study to verify the sustainable development status in natural gas operation. Existing policies, laws, contractual frameworks and institutional structures relating to petroleum operation of Bangladesh are analysed to understand how far the sustainable development concept is incorporated in the petroleum operation. Several loopholes are identified in the existing policies and laws as well as in the contractual frameworks. Moreover, the efficiency and effectiveness of regulatory organisation are also not adequate to meet the requirements of sustainable development of this valuable resource. In this chapter, opinion of experts from different fields concerning natural gas management and government officials is analysed in the light of previously selected six indicators of sustainable natural gas extraction. The opinions have been obtained through semi-structured interview which is a good method for studying a concept and to explore subjective experiences and understandings.¹⁵ For analysing the opinions of different respondents, the researcher has found out some themes under which the various aspects of the opinion will be analysed. In this case at first a number of themes are selected and then the opinions of the experts are analysed based on triangulation method.

This chapter presents more details on the present scenario of compliance mechanism of the upstream petroleum operation with the help of the valuable comments of the respondents and critical analysis of the present status of petroleum operation in the light of selected indicators.

¹⁴See in Chapter 2 of this Thesis, 74-84.

¹⁵Steinar Kvale, *Interviews. An Introduction to Qualitative Research Writing*, (California: Thousand Oaks, Sage Publications, 2016).

5.2 STANDARDS TO COMPLY IN THE SUSTAINABLE NATURAL GAS OPERATION

The natural gas operation is associated with a number of environmental hazards. The gravity of negative impacts on environment may vary on the effectiveness of proper planning and prevention, control and mitigation of pollution.¹⁶ The absence of practical guideline or standard on sustainable measures leads the development of this resource in a more unsustainable manner.¹⁷ Along with six indicators identified by the researcher the perception of sustainable development is also analysed to depict the real picture of sustainable of natural gas operation in Bangladesh.

5.2.1 Perception on Sustainable Development Principles in Oil or Gas Development

Sustainable development is a well established concept and the triple bottom line approach is often used to implement it into some specific field. However, this concept is perceived differently when it comes to people with different academic backgrounds or field of expertise. The researcher wanted to get the respondents' own understanding of the concept of "sustainable development" and the inclusion of sustainable development concept in natural gas operation in Bangladesh. The informants described the concept in different ways.

Sustainability of oil or gas is the efficiency improvement, conservation of the resource and protection of the environment.

Sustainability of natural gas can be achieved by reducing the use considering alternate energy source and by exploring new sources of gas applying latest technologies.

Sustainable development of natural gas should consider the legal obligations to meet the present demand and ensure safety and quality.

It is clear that the respondents are quite aware of the implementation of sustainable development concept in petroleum operation. Different views of the respondents explore different ways the concept can be incorporated into petroleum operation. All three main components of the triple bottom line approach are addressed and in different ways. Conservation of resource for future generation can be ensured by reducing the use of the resource, enhancing the efficiency as well as by exploring new fields applying modern technologies.

Protection of the environment is also highlighted by the respondents. Application of laws should be ensured to protect the environment. Environmental pollution can also be

¹⁶ Good International Petroleum Industry Practice, 286

¹⁷Namuyondo, "*Sustainability and Oil Exploration*," 31.

reduced by applying latest technologies in the exploration and production activities and enhancing the safety against accidents or blowouts.¹⁸

Beside the above triple bottom line to attain sustainable development the respondents emphasise a number of issues. These issues are discussed below.

5.2.1.1 Development of national expertise

To ensure the sustainable development of natural gas domestic sources are the best option and domestic production has to be increased and kept at a steady level.¹⁹ Every country wants to develop domestic fuel to make the energy sector sustainable.²⁰ In Bangladesh, the exploration and production of domestic natural gas will provide both the sustainability and affordability of these resources too.²¹ It could be possible through extracting natural gas by decreasing environmental and other risk and it is only possible by ensuring exploration and production by national oil company.²² Keeping 100% national ownership and producing rationally, considering the demand of national industry the sustainability of natural gas can be ensured.²³ To this end, the national capacity has to be increased through skilled national personnel, and in this regard, long term plan should be taken by the concerned authority for human resources development.²⁴ The experts have to be neutral and independent to perform their function.²⁵ BAPEX should be made stronger and the Government should be prepared to bear some risk, and if in some cases success is not found by BAPEX; it also has to be appreciated.²⁶ Suggestions are also made to merge the BSFL, SGFL with BAPEX into a single entity to make BAPEX a strong national oil company.²⁷ Personnel with proper skill and intellect have to be promoted in proper positions to ensure adequate coordination and understanding of different views.²⁸ Along with development of national expertise it is also opined to borrow or appoint expertise from abroad if required.²⁹ Therefore capability of national institution may be ensured through enactment of new laws and establishment of institution.³⁰ It is also opined that

¹⁸Interview with EP1, ENV1, AC2 and EP3.

¹⁹Interview with GO1 and GO2.

²⁰Interview with EP1.

²¹Interview with EP4.

²²Interview with EP2.

²³Interview with EP5.

²⁴Interview with AC2.

²⁵Interview with EP3.

²⁶Interview with GO2.

²⁷Interview with EP3.

²⁸Interview with AC2.

²⁹Interview with GO1.

³⁰Interview with EP2.

It was possible to improve the BAPEX to compete with any IOC, however the IOCs and their lobbyists do not favour such a move. So the IOCs involve BAPEX with them. Maximum work is done by the BAPEX and the IOCs are benefitted... Though it is called partner but the major works are done by BAPEX with minimum cost but the IOCs gain profit.³¹

Almost all of the respondents are in consensus on the issue that national expertise and capacity have to be developed to meet the sustainable development of natural gas in Bangladesh.

5.2.1.2 Prohibition of export

As the natural gas resource of Bangladesh is limited it should not be exported for economic benefit and there should be a plan to continue producing for a long period according to necessity,³² while the operator wants to produce more than the necessity for more profit and speed up the cost recovery.³³ As natural gas is a depleting resource it can be made sustainable through prohibition of export and rapid exploration. It is opined that

Our limited resources should not be exported for economic benefit. To this end Prohibition of Export of Energy and Mineral Resources Act should be introduced.³⁴

Five respondents are in consensus that to ensure the long term benefit from natural gas, this resource should not be exported for economic benefit .

5.2.1.3 Social equity

One of the crucial points to ensure the sustainable development is the social equity. To this end, it should be ensured that the poor people are benefitted from the natural gas operation.³⁵ For this, the local community who are affected by the petroleum project should have access to these resources.³⁶ Though the downstream operation is not within the ambit of the study, it should be mentioned here that the abnormally low price of natural gas offers privileges to a certain class of the society and it creates social discrimination.³⁷

The views of the respondents raise a number of issues to meet the sustainable development goals of natural gas in Bangladesh. Concerns are expressed that though compared to other fossil fuels natural gas is less harmful to environment, complete sustainable development is not possible through any fossil fuel.³⁸ To ensure sustainability

³¹ Interview with EP2.

³² Interview with EP2 and EP5.

³³ Interview with EP2 and GO2.

³⁴ Interview with EP2

³⁵ Interview with AC2.

³⁶ Interview with ENV1.

³⁷ Interview with ENV1.

³⁸ Interview with EP2 and ENV2.

with fossil fuel is a kind of paradox.³⁹ Any development work causes some harm to the environment, but Bangladesh is not an industrialised country and not much liable for environmental harm, rather it receives pollution from others. To ensure the sustainable development minimisation of negative impacts on environment have to be considered.⁴⁰ However, efficient use of energy, application of modern technology and infrastructural development can play an important role to ensure the sustainable development of natural gas sector.⁴¹

From the above opinion of the respondents, it is clear that the basic concept of sustainable development is compatible with the natural gas operation. To ensure the sustainability of this resource economic, social and environmental developments have to be considered. It can be ensured through minimising the negative impact on environment as a complete reduction of emission of harmful gases is not possible in any fossil fuel operation. Some of the issues as the institutional and regulatory capacities are emphasised to ensure the long-lasting benefit. To this end prohibition of export and social equity also have to be ensured to ensure the intragenerational equity. Long term planning has to be adopted with conservation of resources to meet the intergenerational equity.

5.3 REGULATORY FRAMEWORK

The regulatory framework is not unique and varies from country to country as in some countries sophisticated provision exists with a single source of law to guide the environment management while in some other countries the capacity building in this area is yet to be achieved.⁴² Bangladesh belongs to the latter category as the environmental management standard in the natural gas sector is not sufficient to overcome the probable negative consequences of the operation which is shown in the previous chapter. Therefore, most of the instruments that are now being applied in the natural gas extraction in Bangladesh have not incorporated the concept of sustainable development which is revealed in the discussion of the third chapter of this study.

For a better understanding of the present regulatory practices governing the natural gas sector of Bangladesh to encourage sustainable development of these resources, the

³⁹Interview with EP1.

⁴⁰Interview with PE1 and ENV2.

⁴¹Interview with GO4.

⁴²E&P Forum/UNEP, *Environmental Management in Oil and Gas Exploration and Production an Overview of Issues and Management Approaches*, Joint E&P Forum/UNEP Technical Publication (1997), 24. <https://wedocs.unep.org/bitstream/handle/20.500.11822/8275.pdf> accessed on January 28, 2019.

researcher conducted an interview with the experts and different expressions were found in this regard. The opinion of the experts will be presented under two headings.

5.3.1 Regulatory Practices and Sustainable Development

The different experts from different fields of petroleum or energy sector have expressed their opinion as to the existing policies, laws and its implications on sustainable development of natural gas in Bangladesh. In this regard, it is opined that

The ultimate goal for laws on oil and gas is to establish a legal and regulatory framework on the exploration of petroleum, establish rights and obligations for the operators in upstream development and finally fulfil the energy needs of a country which in turn can help achieve sustainable development.⁴³

It is also expressed that the concept of sustainable development relating to petroleum operation is not included in the laws of Bangladesh as these laws were enacted much before the emergence of this concept and there is no environmental law to address the petroleum operation. As the environmental aspect is governed by other than petroleum law, it is addressed that the environmental laws in this regard are almost neutral and not friendly to sustainable development.⁴⁴

Some of the experts are of the opinion that the laws and regulations relating to petroleum operation should be updated to incorporate the concept of sustainable development. One expert also opined that thinking should be extended not only to meet the SDGs but beyond SDGs to attain a long term development.⁴⁵ Concern is also expressed that the role of the law is not significant to ensure the interest of the country and the existing laws and policies are not properly followed.⁴⁶ It is also expected by the experts that the policy should be revised to emphasise the SDGs and to meet the changing circumstances and technological and scientific development.⁴⁷ The interviews also revealed that absence of political intension coupled with the lack of desire of the controlling authority is one of the reasons for not updating the policy on a regular basis and the decision-makers should take initiatives to update the existing policies.⁴⁸ While another view shows that the objectives of the earlier policy are yet to be achieved and this is why no new policy is formulated as the petroleum sector of Bangladesh is not so diversified.⁴⁹ The only Act to guide the upstream operation of natural gas in Bangladesh is the petroleum Act 1974 which should be amended

⁴³Interview with AC1.

⁴⁴Interview with EP1.

⁴⁵Interview with AC2.

⁴⁶Interview with EP2.

⁴⁷Interview with AC1.

⁴⁸Interview with AC2, EP2, & EP3.

⁴⁹Interview with GO1.

but the amendment have not taken place. According to the experts the reason behind not amending the petroleum laws is that to enact any law some forces have to act behind this. These forces may be internal or external forces like World Bank, Asian Developed Bank, IOC, internal business group or political group. Their pushing is important to enact any new law or to amend existing laws. As a result, the effectiveness of any law, policy and plan depends on the influence group.⁵⁰ Moreover, the enactment of a new law is a difficult process.⁵¹

The researcher also inquired to find the reason for not formulating any rule under the Petroleum Act and the expert expressed their views differently. It is revealed that rules and regulations are sometimes necessary for effective implementation of the law and it is the duty of the concerned ministry to make rules.⁵² But others opined that

There must be a need for rule under the Act according to which the Act is performed. The rule is not framed as no obstacle is faced during the implementation of the provisions of this Act. Without rule perhaps we work under some policy and no barrier is faced to work under the policy. This is why the rule is not formulated and formulation of rules is not getting attention but if the rule is formulated then it may be something in a consolidated form. No one feels the lack of rule and neither Petrobangla and nor BAPEX demand the formation of the rules.⁵³

Another expert also have expressed that though rule should be adopted under the Petroleum Act, non-adoption is not very significant as the exploration and production of petroleum is regulated through MPSC and the MPSC is updated on a regular basis. MPSC acts as the regulation, which mitigates the requirement of rule under the Petroleum Act.

However, the government officials are of different opinion that the concept of sustainable development has already been incorporated in the petroleum policy and existing laws ensure sustainable development. The law itself is not an obstacle to ensure sustainable development as something innovative is never obstructed by law if anyone desires to do so. Rather law sometimes may create complexity to work smoothly. Emphasis on the revision of policy is also given by some respondents. It is also added that the enactment of petroleum law is now an ongoing process.⁵⁴

The academicians express their thought that law does not create any hindrance to work in a sustainable manner but it should be included through amendment of the laws relating petroleum operation to ensure the legally binding obligation of the Government.⁵⁵

⁵⁰Interview with EP2.

⁵¹Interview with EP1.

⁵²Interview with PE1.

⁵³Interview with GO1.

⁵⁴Interview with GO1 and GO2.

⁵⁵Interview with AC1.

There is also some concern regarding the enactment of Speedy Supply of Power and Energy Act 2010 and it is considered as a hurdle for sustainable development of natural gas in Bangladesh as it empowers the authority beyond any accountability.⁵⁶

The view of the petroleum engineers is that there should be a law not only to guide towards attaining sustainable development but also to ensure the safety and quality of the product. Finally to run an institution and to work on principle by well-articulating the principle of SD, the policy has to be examined, re-examined or formulation of the new policy is essential.⁵⁷

5.3.2 Institutional Capacity and Sustainable Development

The researcher considered Petrobangla as the regulating authority of upstream activities in the natural gas operation in Bangladesh and the analysis was based on this consideration. In this regard, the experts from different fields have shared their thoughts through the interview.

There is a confusion about the regulatory authority of upstream petroleum operation. Several experts think that Petrobangla is the regulator of upstream petroleum operation.⁵⁸ On the other hand, some respondents consider that the regulator is not Petrobangla, rather it is the Ministry of Power, Energy and Mineral Resources and Petrobangla works as the representative of the ministry having no regulatory authority. Petrobangla provides only technical supports without making any decision.⁵⁹ It is also mentioned by someone that there is no upstream regulator of the petroleum sector in Bangladesh and there is a necessity of a functional regulatory body comprising renowned academicians, lawyers and professionals from the oil and gas industries to ensure the sustainable development of natural gas.⁶⁰ On the contrary, some of the respondents have opined that BERC should be the regulator of upstream petroleum operation too, because they believe that there should be only one regulatory authority for both the upstream and downstream activities. The qualification of the chairman and members of the BERC is good enough to address the legal violation as the role of the regulator is to keep the institution in line so that no deviation can take place.⁶¹ There is also another view that BERC is the upstream regulator.⁶² Suggestions have also been made to

⁵⁶Interview with EP2.

⁵⁷Interview with EP2.

⁵⁸Interview with EP1, GO1, AC1, GO3, GO2 and EP4.

⁵⁹Interview with AC2 and EP3.

⁶⁰Interview with AC4 and ENV2.

⁶¹Interview with EP3.

⁶²Interview with AC5.

entrust either Petrobangla or BERC with the regulatory authority.⁶³ On the contrary a different view expressed that

Petrobangla is the upstream regulator which is created by law but there is a tendency of some people not to recognise this organisation as a regulator.⁶⁴

The respondents were divided in their opinions regarding the efficiency of Petrobangla as a regulator. On the management side, Petrobangla has often failed to appear accountable for vital issues with respect to upstream petroleum exploration.⁶⁵ The actual decisions are not taken by Petrobangla but the concerned ministries and Petrobangla formally signs the contract. Role of the influence group is also mentionable in this regard.⁶⁶ Moreover, the intellectual capacity of Petrobangla is also not satisfactory.⁶⁷

5.3.3 Separation of the Regulatory Institution and Commercial Interests

The National Energy Policy adopted in 2004 has an objective to strengthen the research, technical and administrative capabilities of the government agencies regarding policymaking and implementation. One and a half decades have elapsed but no such initiative to implement the suggestion is visible. In 2017 Gas Sector Master Plan recommended forming a new upstream regulator and also suggested that the policy section be handled by the Ministry. A number of the respondents have spoken in favour of the separation of the upstream regulatory activities,⁶⁸ while one of the respondents has suggested replacing the names of the bodies, as “*policy and framework, and ‘operation’*”.⁶⁹ A recommendation in the same line is also made to separate the upstream regulator in Bangladesh as it is now followed worldwide.⁷⁰ The role of Petrobangla is also criticised stating that they are not independent and work according to the decision of the controlling authority. In these circumstances no conflict of interest can be raised.⁷¹ It was also expressed that BAPEX as Petrobangla’s subsidiary participates in operation as 10% carried interest partner and no conflict of interest is there, so still it is working all right and there is no need of separation as policy and operation but when once the national company competes with the IOCs then a conflict of interest can arise. Considering this issue the regulatory body can be separated.⁷² When the regulatory body becomes a

⁶³Interview with AC2.

⁶⁴Interview with GO1.

⁶⁵Interview with EP4.

⁶⁶Interview with AC2 and ENV2.

⁶⁷Interview with AC2.

⁶⁸Interview with AC1, AC4, EP1,GO2 and GO3.

⁶⁹Interview with GO3.

⁷⁰Interview with GO2.

⁷¹Interview with EP3.

⁷²Interview with EP1.

member of the implementing body then the conflict of interest may arise.⁷³ A different view also have expressed that

Petrobangla is a department of the Government regarding the oil and gas resources and also the owner of the subsidiary companies on behalf of the Government. The personnel of these companies are government employees. If they are given complete independent the opposite conflict of interest can be take place.⁷⁴

It is also opined that to ensure the sustainable development of natural gas sector updating the upstream legal and regulatory framework can play a very vital role.⁷⁵

From the above discussion, it is clear that the role of policy, laws and institution is not adequate to ensure sustainable development of natural gas in Bangladesh. Eleven respondents are of the opinion that the concept of sustainable development is not included in the existing petroleum laws of Bangladesh. Moreover, the enactment of Speedy Supply of Power and Energy Act 2010 is causing hindrance to the sustainable operation of this valuable resource. Policies are not in implementation and not regularly updated. While a completely different view appeared from the opinions of the government officials that the concept of sustainable development is incorporated in petroleum laws and are followed by Petrobangla. Five respondents have expressed their views that the laws are almost alright, however problem lies in their implementation. There are divided opinions regarding the regulatory body and there is no clear consensus among the respondents about the upstream regulator of the petroleum sector. Therefore a number of issues are disclosed about the regulatory authority and institutional capacity of Petrobangla. The independence and the technical competence of Petrobangla are questionable.

5.4 ENVIRONMENTAL MANAGEMENT

The environmental management system in the petroleum sector can be defined, as a tool comprising the continuous cycle of planning, implementing, monitoring and improving processes and activities to meet the environmental goals of a particular Institution.⁷⁶ The term environmental management is a wide term that comprises a number of environmental steps. Natural gas operation consists of the Initial Environment Examination (IEE), Environment Impact Assessment (EIA), Social Environment Impact Assessment (SEIA), Environment Management Plan (EMP), Environmental Monitoring Programme (EMP), and Environmental

⁷³Interview with EP3.

⁷⁴Interview with GO1.

⁷⁵Interview with GO4.

⁷⁶Okuthe, "Environmental and Social Challenges,"164-74.

Audit and Decommission.⁷⁷ As there is negative coordination between the environmental management and the natural gas operation,⁷⁸ the Bangladesh Environment Conservation Rules of 1997 specifies the acceptable level of emission/discharge of water, air and noise pollutants.

5.4.1 Initial Environment Examination (IEE)

The environmental profile must be prepared before planning any project and it requires the initial environment assessment including the review of the environmental, social and cultural position of the land and applicable laws and land use pattern.⁷⁹

The National Environment Policy of 1992 states that before initiating any project all major undertakings must be under the obligation to conduct the IEE and EIA. Following the policy, the BECA 1995 is enacted, where the provision of ECC was incorporated but no detailed procedure is defined. Later on, the procedure is prescribed through the ECR 1997 where IEE is mandatory for the application to obtain the ECC.⁸⁰ The MPSCs also specify the requirement of IEE before conducting the EIA.⁸¹ However, no detail provision of conducting the IEE is prescribed in the rules. Although the term IEE is inserted in the MPSCs, no specific guideline is provided in this regard. EIA is conducted following the provision of the BECA 1995 and ECR 1997.

On the other hand, in Norway the provision of initial impact assessment is incorporated in their regulation under which their petroleum contracts are conducted and the responsibility is imposed on the concerned ministry to assess the impact prior to starting a new petroleum operation.⁸² This assessment includes the relevant interests that are associated with the operation and makes clear the commercial and environmental impact of the project along with the probable pollution and expected economic and social impact.⁸³ A draft is prepared prescribing the issues required to address during the assessment of the impact which is called the Term of References (ToR).⁸⁴ Then assessment is described in detail containing the issues that are assessed in the assessment procedure.

⁷⁷United Nations, *Berlin II: Guidelines*, 7-18.

⁷⁸Onshore Model Production Contract 2019, art. 36.1.

⁷⁹Weaver, "Sustainable Development in the Petroleum Sector," 18

⁸⁰ Bangladesh Environment Conservation Rules 1997, s 7(6)(d) (ii).

⁸¹ Onshore Model Production Sharing Contract 2019, art. 10.23.

⁸² Regulations to Act Relating to Petroleum Activities, Norwegian Petroleum Directorate, art.6(a) of Regulations to Act relating to petroleum activities, Norwegian Petroleum Directorate. <https://www.npd.no/en/regulations/regulations/petroleum-activities/> accessed February 12, 2019.

⁸³Ibid..

⁸⁴Ibid.

In India, the EIA is conducted in two phases, one part is before the commencement of any exploration and production activity and another is before development and production. In fact, the first part refers to IEE that is conducted in two phases one is prior to any fieldwork and second phase occurs before exploration and drilling activities. The report has to be submitted to the Union Government of India and Ministry of Environment and Forest along with public hearing.⁸⁵ However, no such provision is available in the IEE process of Bangladesh. It includes the provision of IEE but what has to be assessed in this stage and procedure thereof is not defined. The researcher inquired the issue through interview with the respondents and it has been revealed that the initial environment assessment process in the oil and gas sector of Bangladesh is dealt by the DoE. However a few respondents expressed that the IEE is conducted by the DoE to ensure under which category the project will be and whether there is any need of further environmental assessment.⁸⁶ It is suggested that through IEE the ecologically critical area or ecologically fragile area should be kept beyond any exploration and production.⁸⁷ The experts have also opined that proper assessment of environmental and social impact is necessary to sustain the economic benefit, and sustainable development is possible by extracting natural gas minimising the environmental and other risks.⁸⁸

5.4.2 Environmental Impact Assessment (EIA)

The EIA system developed throughout the world after introducing the US National Environmental Policy Act 1969.⁸⁹ Then the EC Directive on Environmental Impact Assessment was approved in 1985 to accelerate the EIA process in Europe. Thereafter it was expanded throughout the world. The purpose of the EIA is to scrutinise the probable impact on the environment to ensure an informed decision making process.⁹⁰ The negative impacts of the petroleum operation on air, water, land are well recognised and are discussed earlier in this chapter. This is why it requires the mandatory EIA in every phase of operation including exploration, development and production stages. EIA process includes screening, scoping and

⁸⁵ Alipak Banerjee, M S Ananth and Vivek Kathpalia, *Oil and Gas Industry in India Legal, Regulatory & Tax*, Nishith Desai Associates (July 2018), 11. https://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research%20Papers/Oil_and_Gas_Industry_in_India.pdf accessed on October 21, 2019.

⁸⁶ Interview with ENV1.

⁸⁷ Interview with ENV1.

⁸⁸ Interview with EP2 and AC2.

⁸⁹ Allan Ingelson and Chilenye Nwapi, "Environmental Impact Assessment Process for Oil, Gas and Mining Projects in Nigeria: A Critical Analysis," *Law, Environment and Development Journal* 10, no. 1(2014): 35-56 <http://www.lead-journal.org/content/14035.pdf> accessed on March 21, 2020.

⁹⁰ Wirth, "The Rio Declaration on Environment and Development."

term of reference and there is a specific time period for reviewing these issues.⁹¹ Therefore, it identifies the major impacts of the proposed project with the recommendation to identify the best suitable measures, to minimise the impact and to improve the environmental value.⁹²

Terms of reference determines what should be included in the EIA and is prepared by the Government and before finalisation, it is reviewed by the government agencies and the public.⁹³ Thereafter, alternatives are analysed with a view to establishing an environment-friendly petroleum operation, and assessment of the socioeconomic, biospheric and regional impact of the operation.⁹⁴ Collection of reliable baseline data is one of the fundamental requirements of the EIA process to measure the impact of the project, but most of the scholars recognise it as one of the major obstacles to ensure the effective EIA.⁹⁵ After completing the EIA the report will be submitted as the Environment Impact Statement (EIS), which must comply with the statutory law of the host country.⁹⁶ EIA process is one of the requirements to be carried out for exploration in almost all the oil and gas producing countries. Unfortunately, the World Bank in its findings on the survey of environmental governance in petroleum producing countries concluded that the purpose of the EIA is used for the approval of the petroleum project on site rather than minimising the social and environmental impact.⁹⁷

In Bangladesh, though the petroleum exploration activities began in 1908 and production held in 1960, the environmental planning through EIA process was not incorporated before 1992, because the National Environment Policy of 1992 clearly specified that to implement any project to extract fossil fuel and minerals the EIA should be carried out.⁹⁸ Following the environmental policy, the BECA 1995 was passed and a provision was added in section 12 that “No industrial unit or project shall be established or undertaken without obtaining, in the manner prescribed by rules, an Environmental Clearance Certificate from the Director General”.⁹⁹ The detailed rules regarding the ECC prescribed by the ECR of 1997 denotes that before obtaining the ECC, the location clearance certificate has to be achieved from the DoE by the industrial unit under the orange –A, orange –B and red

⁹¹Alba, *Environmental Governance in Oil-Producing Developing Countries*, 15.

⁹²Weaver, “Sustainable Development in the Petroleum Sector,” 18.

⁹³Alba, *Environmental Governance in Oil-Producing Developing Countries*, 15.

⁹⁴*Ibid.*, 16.

⁹⁵Ingelson and Nwapi, “Environmental Impact Assessment Process,” 37.

⁹⁶Weaver, “Sustainable Development in the Petroleum Sector,” 18.

⁹⁷Alba, *Environmental Governance in Oil-Producing Developing Countries*, 18

⁹⁸National Environment Policy 1992, s 3.4.6. Department of Environment, Ministry of Environment and Forests, Government of the People’s Republic of Bangladesh.

⁹⁹The Bangladesh Environment Conservation Act 1995, s 12.

category. However, the DG in its discretion may issue the ECC without the location clearance certificate.¹⁰⁰

Thereafter A Guide to ECC Procedure published by the Department of Environment in 2010 regarding the process of obtaining the ECC states that before obtaining an ECC for red category industry the IEE is a must, then comes the EIA with term of reference (ToR) along with its flow diagram. The applicant has to present a layout plan with the location of effluent treatment plant and its process flow diagram. The time schedule of effluent treatment is also required to achieve the ECC¹⁰¹ and the site clearance certificate is compulsory. In granting site clearance certificate the DoE may visit the site. Thereafter the EMP is essential. In case of EMP, the location of effluent treatment plant is also required. The application is to be made to the DG of DoE for the ECC along with the aforesaid reports and the DG is the exclusive authority to issue such certificate. All the responsibility to issue an ECC is delegated to the DoE and no other department is associated here though a number of departments are involved directly and/or indirectly. On the other hand, a number of departments such as the Department of Forest, State Pollution Control Board, and Water Management Authority are also associated in issuing an ECC for petroleum operation in India.¹⁰² In case of site clearance certificate the site may be in plain land or in the forest, but no provision is added to visit by the Forest Department. The Environment Conservation Rules prescribes a number of issues to implement the Act efficiently but in case of EIA, the indicators to be measured are not defined. Therefore, the applicant or the petroleum industry is also under the obligation to submit the emergency plan required to mitigate the adverse environmental impact. Moreover, provision was inserted to submit rehabilitation plan where applicable. As the petroleum operation required a huge area of land that requires rehabilitation, so the rehabilitation plan is also submitted by the applicant under the guidance.¹⁰³

At present, EIA is a legal requirement for natural gas operation in Bangladesh, though its achievement is not clear. Most of the developing countries have inserted this provision as an ornamental one, which is aimed at satisfying the dry letter of regulatory provision with a

¹⁰⁰Bangladesh Environment Conservation Rules 1997, s 7(4).

¹⁰¹Department of Environment (DoE), "A Guide to Environment Clearance Procedure," Department of Environment, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh (2010).

¹⁰²Das, "Environmental Management in Oil and Gas"

¹⁰³Department of Environment (DoE), "A Guide to Environment Clearance Procedure."

view to achieving the permission of operation.¹⁰⁴ Ingelson and Nwapi¹⁰⁵ reported that in Nigeria, the reason behind this is identified as lack of political commitment of the Government to implement environmental standards, the shortage of baseline information to assess environmental impacts and lack of committed enforcement of EIA reports.

The present process of obtaining ECC for the red category industries in Bangladesh is presented in Figure 5.1. The process shows that the applicant (industrial unit) has to apply with the IEE and ToR (terms of references) to the DoE. However, a survey conducted on 32 oil producing countries reveals that the ToR are specified by the Government of the host country.¹⁰⁶

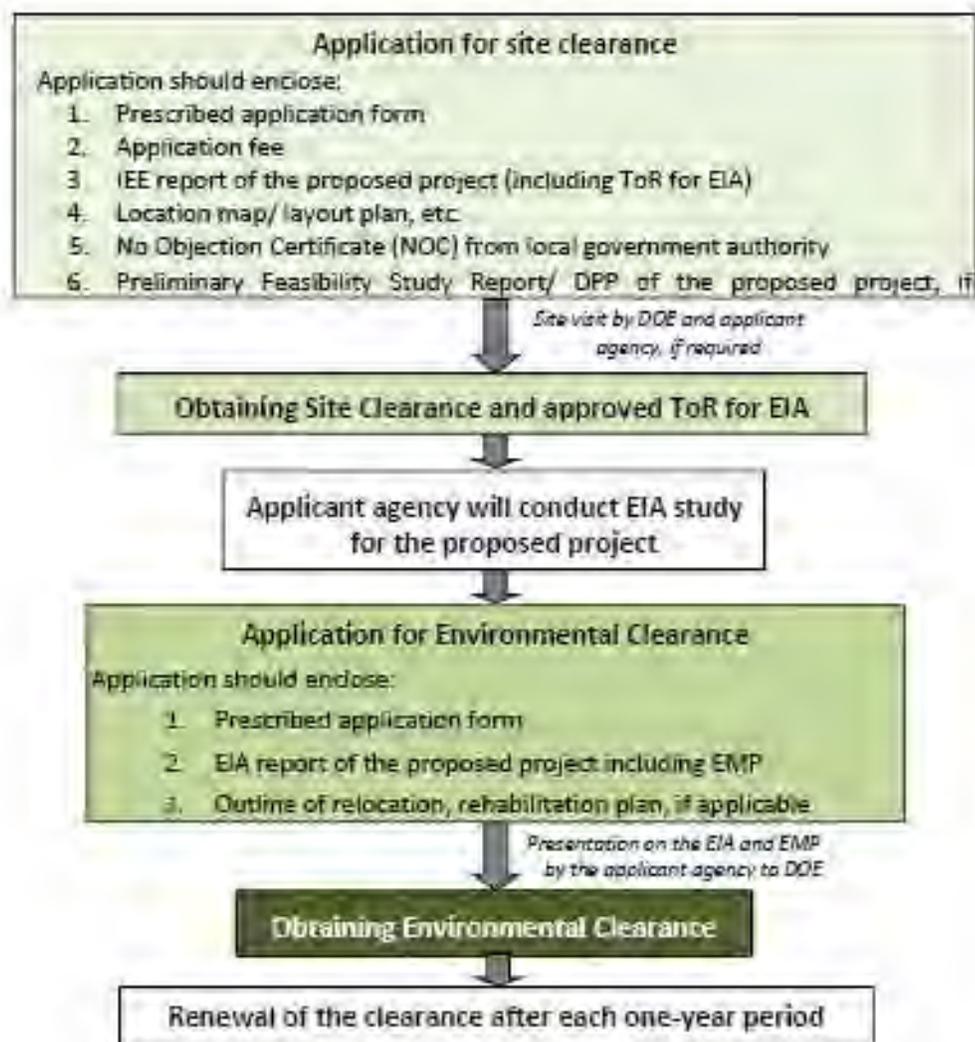


Figure 5.1 Process of obtaining clearance certificate from DoE in Bangladesh

¹⁰⁴Ingelson and Nwapi, "Environmental Impact Assessment Process," 37.

¹⁰⁵Ibid., 38.

¹⁰⁶Alba, *Environmental Governance in Oil-Producing Developing Countries*, 15.

The Government has to ensure the compliance of the petroleum industry with the existing environmental requirements, so the concerned government authority should prescribe the ToR. Otherwise, the industry may determine the ToR to maximise the profit rather than protecting the environment. In Bangladesh the ToR is determined by company or industrial unit instead of the Government as the application for site clearance certificate contains the IEE report along with the ToR of EIA. A survey was conducted among 27 oil producing countries by the World Bank and it found out that in most of the countries the environmental policy and legislation are theoretical and effectiveness is compromised due to lack of organised administrative structure.¹⁰⁷ Most of the countries adopt the EIA process to get the project approved rather than managing environmental and social issues in the lifecycle of the project and limitation is noticed in enforcement and control mechanism.¹⁰⁸

Norway is considered the model for sustainable petroleum operation in the world and this country clearly describes the environment impact assessment process along with the prescribed issues that has to be assessed during the EIA. The assessment procedure is prescribed in two phases that are (i) initial stage and (ii) the development and production stage. The ministry is the prime authority to decide on the EIA and the regulation states that during the approval of the EIA the ministry also prescribes the environmental monitoring programme along with the provision of compensation for any environmental impact.¹⁰⁹ Flexibility is also found in the regulation that the requirement of EIA may be relaxed if the daily production of oil is 4000 barrels per day and natural gas production is 500,000m³ per day and for those operations having no significant impact on the environment.¹¹⁰ However, the exemption of EIA will not be up to whim of the ministry. The provision of check and balance is also incorporated which define that the ministry has to inform the reason of exemption of EIA to the EFTA (European Free Trade Association) surveillance authority.¹¹¹

To understand the actual picture of the EIA process in gas sector of Bangladesh the researcher sought opinion from the respondents in this regard and different views were expressed by the experts from different fields of petroleum sector.

It is expressed that EIA is compulsory for any natural gas operation and without EIA no ECC is issued by the DoE.¹¹² The clearance is also needed from the Department of

¹⁰⁷Alba, *Environmental Governance in Oil-Producing Developing Countries*.

¹⁰⁸Alba, *Environmental Governance in Oil-Producing Developing Countries*.

¹⁰⁹Regulations to Act Relating to Petroleum Activities,art.6(b).

¹¹⁰Ibid., art.22(c).

¹¹¹Ibid.

¹¹²Interview with EP1,GO2, PE1, AC4, PE1 and GO3.

Livestock and Fisheries and they issue the No Objection Certificate (NOC). In this respect a new committee is formed as National Hydraulic Committee and NOC is also required from this department. After submitting all the documents to the DoE along with EIA report the ECC is granted by the DoE. Without EIA and ECC report companies are not permitted to work in the field. It is also opined that

In this case though the relevant law does not incorporate any provision as to the procedure of EIA or how to achieve the ECC but the relevant department makes clear the procedure in this regard.¹¹³

One of the experts has opined that throughout the world the general rule is that the company that proposes the project conducts the EIA informing the ToR and providing the name of the institution by which the EIA is conducted to DoE. Finally, the EIA report along with the probable negative impact that are subject to mitigation is submitted to the DoE and another report contains probable negative impacts which are immitigable.¹¹⁴

Though the EIA process is theoretically alright, the experts have expressed their concern about its implementation as a number of projects run in different government sectors without conducting any EIA and in some cases they do not take the approval of the DoE.¹¹⁵

It has been also expressed that the institutional capacity of the DoE is not adequate enough to assess the impacts on environment. Moreover, the function of DoE is regarded as formalities to rationalise the project without properly assessing whether the project is environmentally sustainable or not.¹¹⁶ The Government is under an obligation to attain SD and to meet the SDGs but the DoE is very weak in this regard and does not have adequate manpower even to ensure the proper supervision on environmental issues and this happens as this department is not prioritised by the decision makers. If the Department of Environment becomes effective then not only the gas sector of Bangladesh, but other companies and economic activities also will be subject to accountability but it needs proper attention from the Government.¹¹⁷

The lack of experts in various environmental fields is also one of the reasons for which the DoE faces difficulty to coordinate among the concerned departments related with the environmental issues regarding petroleum operation.¹¹⁸ Suggestions have also been made that as the exploration and production of natural gas negatively impacts the environment

¹¹³Interview with GO2.

¹¹⁴Interview with ENV1.

¹¹⁵Interview with ENV1.

¹¹⁶Interview with EP3.

¹¹⁷Interview with EP2 and AC5.

¹¹⁸Interview with AC5.

including biodiversity, a direct link should be established between the DoE and concerned departments of biodiversity and make the DoE more efficient in this regard.¹¹⁹ In this regard AC1 remarks that

ECC is issued by the Department of Environment which is a government agency. So compliance depends on the DoE.

The respondents have expressed their concerns that the role of the DG of DoE is not so evident and their departmental investigation regarding the environmental impacts sometimes does not correlate with their issuing of ECC.¹²⁰ Lack of absence of working environment along with the inadequate manpower is also responsible for such situation as this department cannot work independently and sometimes decisions are influenced.¹²¹ On the contrary, it is also opined that Petrobangla follows the DoE guidelines to obtain required ECC as it is mandatory before starting any project.¹²²

The researcher also enquired about the integration of the biodiversity concerns in EIA process and it is opined that biodiversity concerns are not always incorporated during EIA as the methodology is not yet developed to integrate all the concerned issues regarding this.¹²³ The EIA methodology followed in Bangladesh is not satisfactory and full proof.¹²⁴ Opinion is also made in this regard that in an EIA process scoping and bounding is very important, and scoping as a part of EIA considers all biodiversity and ecological parameters and is required to submit report to the DoE along with the names of the concerned experts from different fields of environment.¹²⁵ It is also commented that in every project EIA is must and the ECC is issued after receiving clearance from a number of departments. In fact there are many good provisions in Bangladesh but these are not in practice.¹²⁶

A different view also appears claiming that the negative impact on environment resulted from natural gas is comparatively low,¹²⁷ which can be controlled through modern technology.¹²⁸ Although the emission of natural gas is lower than other fossil fuels, the gas

¹¹⁹Interview with AC4 and AC5.

¹²⁰Interview with EP2.

¹²¹Interview with EP2 and ENV1.

¹²²Interview with GO3, GO4 and PE1.

¹²³Interview with AC1.

¹²⁴Interview with ENV1.

¹²⁵Interview with ENV1.

¹²⁶interview with ENV2.

¹²⁷Interview with EP2, EP3 and ENV1.

¹²⁸Interview with EP3.

leakages, which are very common in natural gas activities, are more adversely affecting the environment than emission.¹²⁹

EIA is a significant step of natural gas operation and after analysing the opinion of the respondents it is revealed that the EIA process is theoretically incorporated in the upstream operation and ten respondents are in consensus about their incorporation while some of them are not satisfied with the practical implementation of the EIA process.

5.4.3 Social Impact Assessment (SIA)

In case of mining investment, the evaluation is made mostly on the financial, political and social risks associated with the mining operation.¹³⁰ It requires the social impact assessment. Social impact assessment is defined as the evaluation of the social impact caused by specific political activities or the project.¹³¹ Here the second one is crucial. The environment and social issues are closely interconnected.¹³² The entire activities of the petroleum operation affect the surrounding areas in a number of ways.¹³³ The operation changes the land use pattern, fishing, hunting, trapping and cultural heritage of the communities at the site. In addition, infrastructural improvement leads to rapid changes in their social belief, practice and structure.¹³⁴ Petroleum operation has both positive and negative impacts on the human environment. The positive impacts include the improvement of local economy, employment opportunity, development of infrastructural and transport facilities, health care facilities etc.¹³⁵ On the contrary, the negative impacts cover the displacement of the local inhabitants, health hazards due to noise, water, soil and air pollution, loss of biodiversity leading to frustration among those peoples who are dependent on those natural resources for their livelihood, etc. Moreover, after completing the production of petroleum the local production cannot be restored in its pre existing patterns.¹³⁶ It is evident from the Prestige oil spills of Asturias and Cantabria of Spain that the health hazards like long term respiratory disease and

¹²⁹ Researcher interviewed with ENV1.

¹³⁰ Alana Wilson and Miguel Cervantes, *Annual Survey of Mining Companies 2013*, Fraser Institute (2014). <https://www.fraserinstitute.org/sites/default/files/mining-survey-2013.pdf> accessed on May 12, 2020.

¹³¹ Eerola, *Corporate Social Responsibility in Mineral Exploration*, 37.

¹³² Okuthe, "Environmental and Social Challenges," 164-74.

¹³³ Alam et al., "Environmental Impact Assessment of Oil and Gas Sector: A Case Study of Magurchara Gas Field," *Journal of Soil Science and Environmental Management* 1, no.5 (July, 2010): 86-91.

¹³⁴ Weaver, "Sustainable Development in the Petroleum Sector," 12.

¹³⁵ Eerola, *Corporate Social Responsibility in Mineral Exploration*, 37-38.

¹³⁶ Terry L. Karl, "Oil-Led Development: Social, Political, and Economic Consequences," *CDDRL Working Papers*, Center on Democracy, Development, and The Rule of Law, no. 80 (2007), 24.

chromosomal damage occurs as a result of the spillage.¹³⁷ There is a global conflict between the petroleum operation and the rights of the indigenous people occupying the place where the very petroleum is discovered.¹³⁸ In this regard it is specified in the United Nations Environmental Programme (UNEP) that together with the assessment of the impact on natural environment the human, socio-economic and cultural impacts must also be assessed carefully.¹³⁹

From the very beginning, the oil and gas producing countries showed their negligence to pay attention to environmental and social impacts of this operation.¹⁴⁰ But the situation is changing for the better recently. In Finland, social impact assessment is a mandatory requirement as a part of EIA before starting any project and it is examined from the very period of collecting the baseline information, though it is not followed in mineral project considering its minimum impacts on environment.¹⁴¹ In Mexico, approval of the SIA through Ministry of Energy is a must before initiating any production activities. To this end, the Ministry of Energy has issued a general guideline to assist the energy industry to evaluate the social impact with a number of variables or key characters.¹⁴² On the contrary, no such initiative is found in the regulatory framework of natural gas extraction in Bangladesh. The social impact is not considered as an essential ingredient of environment management yet. Recently the Bangladesh Environment Policy is adopted in 2018, but it has not emphasised on SIA, rather it has prioritised strategic environment assessment, which is not clearly defined. However, the NBSAP¹⁴³ incorporated the provision of SIA along with the EIA in 2004. Unfortunately following the NBSAP neither any petroleum legislation nor any environment legislation is enacted or amended to ensure the assessment of social impact of petroleum operation and to introduce their mitigation process.

Regarding this issue the respondents have opined that for sustainable economic development the environmental and social impacts should be properly evaluated though the operator tries to escape from this obligation to make the project more profitable. The experts

¹³⁷Aniefiok E. Ite, Udo J. Ibok, Margaret U. Ite, and Sunday W. Petters, "Petroleum Exploration and Production: Past and Present Environmental Issues in the Nigeria's Niger Delta." *American Journal of Environmental Protection* 1, no. 4 (2013): 78-90. doi: 10.12691/env-1-4-2.

¹³⁸Ingelson and Nwapi, "Environmental Impact Assessment Process," 37.

¹³⁹UNEP, *From Conflict to Peace Building: The Role of Natural Resources and the Environment* (UNEP, 2009), 11. <https://wedocs.unep.org/handle/20.500.11822/7867>. Cited in Namuyondo, "Sustainability and Oil Exploration."

¹⁴⁰Okuthe, "Environmental and Social Challenges," 164-74.

¹⁴¹Eerola, *Corporate Social Responsibility in Mineral Exploration*, 37.

¹⁴²Ramos, "Social Sustainability in Oil and Gas Projects".

¹⁴³National Biodiversity Strategy and Action Plan for Bangladesh.

have also opined that the real problem is not making profit by the operator; because as a business entity they will always try to make profit, but non compliance occurs when they want to ensure more profit.¹⁴⁴ As the social impact assessment as part of the EIA is a new phenomenon, it is also opined that such kind of methodology is not yet formulated in Bangladesh.¹⁴⁵ However, there is a different view that in natural gas operation EIA and SIA are maintained.¹⁴⁶

5.4.4 Environmental Monitoring Programme

To evaluate the effectiveness of the controlling measure, the environmental monitoring programme is very significant. A report prepared by the European commission states that “Environmental monitoring can involve direct or indirect measurement of emissions, discharges, and resource use applicable to operations and process parameters, as well as of impacts on environmental receptors.”¹⁴⁷ Monitoring is required from the commencement to decommission of the project. It also facilitates understanding the unforeseen effect on the environment that leads to initiate the new measures to respond to the new situation.¹⁴⁸ Effective monitoring helps to improve the operational standard and assists to evaluate the compliance with the environmental terms and conditions by the operator during the operation.¹⁴⁹ The monitoring includes the assessment of baseline information, therefore the impact on air quality, water quality and quantity, soil quality, noise and vibration, emission, discharge, odours etc. after the commencement of the operation.¹⁵⁰ It assists to differentiate the environmental condition before and after the commencement of the operation. There must have credible monitoring and review protocols that can ultimately be implemented by nations, including public outreach and training programmes for government officials, local community members, and NGOs.¹⁵¹ The parameters of monitoring are selected for every

¹⁴⁴Interviewed with ENV1 and AC2 by the researcher.

¹⁴⁵Interviewed with AC1.

¹⁴⁶Interviewed with GO4.

¹⁴⁷Wood, *Best Available Techniques Guidance Document on Upstream Hydrocarbon Exploration and Production* (European Commission, 2019), 117. <https://op.europa.eu/en/publication-detail/-/publication/f9265d2b-574d-11e9-a8ed-01aa75ed71a1/language-en/format-PDF/source-93598867> accessed on May 11, 2020.

¹⁴⁸Weaver, “Sustainable Development in the Petroleum Sector,” 19.

¹⁴⁹Wood, *Best Available Techniques Guidance Document on Upstream Hydrocarbon Exploration and Production*, 117.

¹⁵⁰Wood, *Best Available Techniques Guidance Document on Upstream Hydrocarbon Exploration and Production*, 117.

¹⁵¹Weaver, “Sustainable Development in the Petroleum Sector,” 31.

phase of the operation regarding emission and discharge and their impact on the receiving environment.¹⁵²

The Environment Conservation Rules 1997 of Bangladesh prescribes the standards of air, water, level of sound and odour for the different areas like residential area, industrial area etc. Sewage discharge, project waste, project wise gaseous emission, industrial effluent, and their acceptable limit in various sectors during the operation for each industry are also addressed in the Rules.¹⁵³ Standards are also prescribed for the oil and gas industry in Bangladesh. It is important to study whether the operating industries are complying with the prescribed limit or not, because it is determined by effective monitoring and without monitoring system the prescription of standard is meaningless. However, there is no monitoring provision either in environmental law, or in petroleum laws and in the MPSCs of Bangladesh.

The purpose of the monitoring is to evaluate the changes occurring in the existing environment during drilling, appraisal, development and production of petroleum. It requires special expertise in this regard. This is why the EIA monitoring should be prioritised with the help of qualified consultants as it requires special knowledge and to this end monitoring capacity should be enhanced through training and workshops.¹⁵⁴ This ensures the proper environmental management during petroleum operation, evaluates the hazard on site and confirms their effective management.¹⁵⁵ It also ensures the sustainable operation and assists to avoid any unforeseen unexpected incidents. Some respondents have also emphasised on proper monitoring and stated that proper monitoring system should be established to ensure the compliance of the operating companies.¹⁵⁶

5.4.5 Decommission and Abandonment

After completion of the production when the well is declared abandoned, there is a necessity of decommissioning with proper plugging, removing of installation and recycling of the waste to restore the local environment.¹⁵⁷ If it is not properly handled, it can unleash danger to people and environment of the surrounding areas.¹⁵⁸ In some cases, the host country

¹⁵²Wood, "Best Available Techniques Guidance Document on Upstream Hydrocarbon Exploration and Production," 118.

¹⁵³The Environment Conservation Rules 1997, sch. 2-12.

¹⁵⁴Alba, *Environmental Governance in Oil-Producing Developing Countries*

¹⁵⁵Good International Petroleum Industry Practice, 287.

¹⁵⁶Interview with AC5 by the researcher.

¹⁵⁷Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector," 15-20.

¹⁵⁸Samuel Chisa Dike, "Decommissioning and Abandonment of Oil and Gas Facilities Legal Regime in Nigeria: Any Lesson From Norway, the UK and Brazilian Legal Frameworks?," *Journal of Private Law* (September 2017).

continues the operation when it is left by the IOCs but in such cases, the IOCs leave a fund for decommission. However, some of the companies use the superficial remediation of the environment to minimise the cost.¹⁵⁹ This is a very significant phase of the EIA process, as a study carried out in UK suggests that inappropriate decommission is mainly responsible for compromising the soil condition above the petroleum well.¹⁶⁰ It is revealed in a survey by the World Bank on 27 developing countries that in most of the developing countries, the Governments pay little attention to this significant phase.¹⁶¹ In Bangladesh, the decommission phase of the operation is governed by the PSC. There is a separate section regarding the abandonment of operation. The terms decommission and abandonment are used interchangeably though in many countries of the world the word abandonment is used instead of decommission. Actually there is a little difference between decommission and abandonment as the decommission takes place after certain amount of time from abandonment of operation and usually is completed within six months thereafter.¹⁶² However, before 2008 there was no provision of abandonment in the MPSCs of Bangladesh and it was first introduced in the MPSC of 2008 which is still continued in the latest MPSC of 2019. There is a provision of abandonment fund payable by the contractor and subject to cost recovery.¹⁶³ In this case, the important incorporation is that the liability of contractor is extended even after the termination of contract if any damage is caused to the environment or for any cost or expenses that rises due to willful negligence of the contractor during the operation.¹⁶⁴ Actually, it refers to the situation when the contractor fails to conduct the responsibility of decommission or abandonment properly. It is a very significant provision but the application mechanism is not specified. The effect of failure of proper decommission negatively affects the concerned community, and that is why proper decommission requires consultation with the local community.¹⁶⁵ Provision of public hearing in decommission is one of the significant aspects that can find out a suitable decommission method. For example, in Brent Spar of Britain, public opinion assisted to reach a more generally acceptable process of decommission.¹⁶⁶ During the natural gas operation in Bangladesh a number of blowouts occurred due to the negligence of the operating companies but they were able to avoid the

¹⁵⁹Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector,"15-20.

¹⁶⁰ B. Anifowose et al., "A Systematic Quality Assessment of Environmental Impact Statements in the Oil and Gas Industry," *Science of the Total Environment* 572 (2016): 570–85.

¹⁶¹Alba, *Environmental Governance in Oil-Producing Developing Countries*

¹⁶² Dike, "Decommissioning and Abandonment of Oil and Gas Facilities"

¹⁶³Model Production Sharing Contract 2008,art. 35.2.2.

¹⁶⁴Ibid., art. 35.2.1.

¹⁶⁵ Dike, "Decommissioning and Abandonment of Oil and Gas Facilities"

¹⁶⁶Ibid.

responsibility and the actual compensation for the blowouts has not been realised yet. Usually after termination of the contract of petroleum operation the company goes out of reach. In fact, the incorporation of provision to make the operating company responsible after termination of the contract for any damage to the environment because of failure to conduct decommission in proper way or any negligence during the operation is merely ornamental without any mechanism of implementation. Another matter of concern is that there is no specific law or regulation regarding the standard of the abandonment process to which the company has to comply. The MPSC of 2008 states that

“The Parties recognize that they must comply with their Abandonment obligations in accordance with the relevant Bangladeshi law which is applicable or which may become applicable and in the absence of specific Bangladeshi law such Abandonment obligations to be undertaken or proposed to be undertaken shall be in accordance with good and modern international practice”.

This provision was inserted in 2008 when there was no specific law in this regard. However, the same provision is continued in the latest MPSC of 2019. During this period of 11 years, the Government has not prescribed any rule or regulation regarding the abandonment or decommission of the petroleum operation. The Government should initiate proper regulatory mechanism with prescriptive approach to specify the terms and conditions that the contractor has to abide by during abandonment stage. In this case some global standards should be included in the domestic law regarding decommission such as specifying degree of abandonment, methods applying to removal of structures, verification of the methods, disposal of wastes, debris and structures, protection of environment and monitoring that requires separate EIA and remedial measure for abandonment and decommission phase.¹⁶⁷ In fact, the domestic law should prioritise the sustainability and safety of environment and personnel. In Norway, The Petroleum Activities Act of 1958 clearly states the obligation of the contractor regarding decommission responsibility and it is the main instrument upon which decommission is subsumed. Section 50 of this Act requires the submission of complete decommission plan during the operation along with a comprehensive plan for disposal after consultation with different concerned authorities.¹⁶⁸ The Regulation to petroleum activities also describes the details of decommission plan and the issues to be addressed in this plan are defined by the regulation. It also necessitates that the plan has to be submitted to the the Royal Ministry of Petroleum and Energy, Ministry of Labour and Social Inclusion and a copy has to be submitted to the Directorate of Petroleum and to the Petroleum

¹⁶⁷Dike, “Decommissioning and Abandonment of Oil and Gas Facilities”

¹⁶⁸Ibid.

Safety Authority of Norway. This phase also requires the EIA, as a number of environmental issues are related with the disposal and other relating matters.¹⁶⁹ In UK, the Petroleum Act 1998 provides orderly guidelines about the decommissioned and abandoned structures and the Act also enables the Secretary of State to formulate regulation regarding decommission,¹⁷⁰ whereas the only Act governing the upstream operation of petroleum in Bangladesh is the Petroleum Act 1974, which is completely silent about decommission or abandonment phase of the operation. At present, it is regulated under MPSC without any details, simply referring to “good oil field practice”. Moreover, it is not clearly specified which practice will be followed. Proper decommission through proper regulatory and accountable framework is required to facilitate the environmental liabilities management.¹⁷¹ In this case, the model of Brazil is an example where economic benefit is offered to the operating company while conducting decommission in compliance with the guidelines regarding health and environment.¹⁷² To ensure proper decommission in an environment friendly manner, there must be some provisions for the operating company to comply along with its penalty provision for noncompliance with the decommission standard. However, no rules or regulations have been prescribed by the Government regarding the abandonment. The second option mentioned in the MPSC, the good and modern international practice, is followed by the operator.

The researcher has interviewed the respondents to to know about their understanding about good and modern international practices regarding decommission and different views are revealed as it is articulated that it is mandatory to comply with the good international practices and without these standards the work programme is not acceptable by Petrobangla. In this regard Bangladesh mainly follows the standard of ASTM¹⁷³ and API¹⁷⁴ as the ASTM and API are the commonly used international standards.¹⁷⁵ It is also mentioned that the practices followed by IOCs are globally acceptable”.¹⁷⁶ Good and modern international practice, according to an expert is “to have good record to maintain minimum loss of environment and compensate the environmental loss if happened.”¹⁷⁷ Another view also shows that, the practice followed by the IOCs though not bad, should be defined and specific.

¹⁶⁹Regulations to Act Relating to Petroleum Activities, art. 43,44.45and 45(a) (1997).

¹⁷⁰ Dike, “Decommissioning and Abandonment of Oil and Gas Facilities.”

¹⁷¹Dike, “Decommissioning and Abandonment of Oil and Gas Facilities.”

¹⁷² Ibid.

¹⁷³American Society for Testing and Materials

¹⁷⁴American Petroleum Institute

¹⁷⁵Interviewed with GO2.

¹⁷⁶Interviewed with GO3.

¹⁷⁷Interviewed with AC4.

In this case the operating company can maintain a list that they will follow it as good international practice.¹⁷⁸ A respondent of this research also clarifies that “Good international practice’ is not defined but generally it refers to internationally accepted practices which are followed globally.”¹⁷⁹

There is no written standard about good international practice.¹⁸⁰ The industries are self regulated and have made some guidelines and on ground practices and their own restriction. They have some strict regulations regarding manpower and safety but most of the oil companies are running on self-responsibility which they term as good international practice of oil industry.¹⁸¹ It is also opined that though the term is not defined, it is known as when the wastages are abandoned in environmentally sound way, not contaminating the environmental ingredients it can be said as good international practice.¹⁸² The petroleum industries have developed some guidelines during the operation due to fear of compensation and treat it as good international practice.¹⁸³ It is also stated that, in the absence of defined good international practice and strong clause regarding compensation in the MPSCs of Bangladesh and the joint venture of NOC (National Oil Company) with IOCs creates additional risk of environmental damages with no compensation.¹⁸⁴ The experts have also added that due to this reason Bangladesh has failed to realise the compensation from Niko in spite of ample tangible evidence that the reason behind the blowout is operational failure and inappropriate casing design of Niko. The same incident took place in Maguchara blowout where the investigation reports hold the operating company responsible for negligence, irresponsibility and mistakes but no compensation had been realised.¹⁸⁵ It is also opined that the term is used just as a jargon without having any standard, the operator has opportunity to think of any standard as good international practice.¹⁸⁶

Another view is also presented that it is not possible to set a single standard as different companies are involved in different activities at different phase of an operation. But the companies follow more or less the same standard.¹⁸⁷

¹⁷⁸Interview with AC2.

¹⁷⁹Interview with AC1.

¹⁸⁰Interview with EP1, EP2 and EP5.

¹⁸¹Interview with EP1

¹⁸²Interview with EP1.

¹⁸³Interview with ENV1.

¹⁸⁴Interview with EP5.

¹⁸⁵Interview with EP5

¹⁸⁶Interview with EP2.

¹⁸⁷Interview with PE1.

The researcher inquired about the compliance of the operating company with the good international practice along with national laws and in this regard different views also appeared. One respondent have opined that

“Currently international petroleum companies operating in Bangladesh are complying with the international norms on petroleum industry. They are conducting their operation as per the model PSCs of Bangladesh. Model PSCs are based on international norms and practices. In case of dispute, it can be referred to international tribunals”¹⁸⁸

It is also expressed that the compliance with international petroleum practice is mandatory.¹⁸⁹ A different view also has expressed that the IOCs are very powerful. Though in their own countries they are highly subsidised, they had some allegations against them and they had to compensate. When they operate in weak countries then they care very little. They develop some strict rules and regulations to comply but in developing countries with weak regulations very often they try to escape those. In their own country they are not able to do so because of strong role of the regulatory authority and existence of strict regulations. Whereas in developing countries like Bangladesh they maintain a strong lobby to work in their favour.. Another matter is that the regulatory framework of Bangladesh is very weak which is also evident from the Magurchara and Tengratilla blowouts, as both operating companies were liable under international law but initiatives taken by the controlling authority are not enough.¹⁹⁰

From the above opinion it is revealed that the government officials and some of the academicians are almost satisfied with the practice followed by the operator while energy experts and some of the academicians opined that practice followed by the operating companies is not adequate and a number of loopholes are identified by them in this regard. The role of the DoE is also not satisfactory and proper working environment of this department is not ensured due to lack of manpower and financial support. The method of integrating the Social Impact Assessment (SIA) and biodiversity concern is yet to be developed. That demands the initiative of the Government to specify the terms and conditions that should be followed by the operator during the abandonment and decommission phases of natural gas operation. The EIA process should be implemented in proper way to identify the actual matters that are likely to impact the environment adversely. The monitoring of mitigation processes should be properly supervised. To this end the MPSCs should clearly

¹⁸⁸Interview with AC1.

¹⁸⁹Interview with GO3.

¹⁹⁰Interview with EP1 and EP2.

define the terms and conditions that have to be complied with as good international practice at all stages of the operation including exploration, production and decommission phases.

5.5 COMMUNITY CONSULTATION AND PUBLIC PARTICIPATION

The impact of petroleum operation on the local community specially, on the indigenous people is evident.¹⁹¹ Before conducting any petroleum operation, it is significant to know the attitude of the local communities, company's representatives and the stakeholders. Community consultation initiates the understanding of the local values and ecological knowledge of that area. Community consultation builds up a bridge between the operating petroleum company and the people affected from their activities. Effective participation of the community promotes sustainable development of the petroleum resources and of the operating area.¹⁹²

The community includes the local stakeholder, local landowners and residents, immediate neighbor, media, municipality, entrepreneurs, NGOs etc.¹⁹³ Engagement of the affected stakeholders in consultation and decision making process facilitates conducting the operation efficiently to operate in environmentally critical areas.¹⁹⁴ A survey was carried out among the representatives of the mining companies in Finland which indicates that negative preconception about the mining operation is very common among the people. It requires the integration of environment management aspect along with transparent communication about the life cycle of the mining to all concerned parties.¹⁹⁵ The involvement of the local community in its various forms is significant for the operation, as they are the competent persons to provide the base line data to conduct EIA and to identify the probable impact on community and the environment.¹⁹⁶ The transparent communication with the local communities is also required for public approval and support of the project that should be continued not only in the development and production stages, but also throughout the entire cycle of the operation.¹⁹⁷ To ensure the effective community engagement in decision making process the discussion among the community, government representatives and companies and any complaint thereof can also be published in the newspaper and social media.¹⁹⁸ However, in most of the cases the companies do not engage the stakeholders in the decision making

¹⁹¹Weaver, "Sustainable Development in the Petroleum Sector," 18.

¹⁹²Soni and Chatterjee, "Governance of the Petroleum and Natural Gas," 20.

¹⁹³Eerola, *Corporate Social Responsibility in Mineral Exploration*, 52-53.

¹⁹⁴Okuthe, "Environmental and Social Challenges," 164-74.

¹⁹⁵Eerola, *Corporate Social Responsibility in Mineral Exploration*, 37-38.

¹⁹⁶Ingelson and Chilenye Nwapi, "Environmental Impact Assessment Process," 35.

¹⁹⁷Eerola, *Corporate Social Responsibility in Mineral Exploration*, 37-38.

¹⁹⁸*Ibid.*,22.

process though it is an important way to know the local community's expectation from the operating companies during the exploration and production phases.¹⁹⁹

Ramos²⁰⁰ specified six steps for conducting an effective community consultation. Firstly, there must be a consultation plan along with the full description of the project and its affected area; secondly, the acknowledgement of previous agreement if any adopted by government authority or operating company or local community; thirdly, delivery of accurate and comprehensive information to enable the community to assess the information properly; fourthly, the internal interaction among the tribal community regarding the project if it is a tribal race; fifthly, consultation with the community with their full freedom to express their opinion regarding the terms and conditions of the project development and lastly, the evaluation and monitoring of the plan.

There is no provision of community consultation and public participation in the entire process of the EIA or at any stage of the natural gas operation in Bangladesh. There is no such provision in the petroleum laws or even in the production sharing contract. Section 6(c) of Bangladesh Petroleum Act 1974 imposes obligation on the operating authority to consider the issues related to ecology and environment. However, it is not easy to find out the environmental and ecology related issues without any interaction with the local community. Without effective process of implementation, inclusion of such provision is ornamental. Even no rule is made under this Act to fill the gaps and guide the implementation of the provisions of the Act. Nonetheless, the NBSAP of 2004 has incorporated the provision of community consultation but it is not mentioned anywhere that how far it is followed in case of natural gas or petroleum operation.

In Norway, in the very beginning the community consultation was not prioritised and at that time it was a decisive decision. Nevertheless, over time, the involvement of the broader part of the society in the decision making processes is playing a very crucial role and it is considered as a pillar of the petroleum governance process. It is recognised that, the petroleum governance of Norway stands on several pillars, such as, an effective and diverse civil society, independent media, number of political parties representing differing interests, numerous institutions of research and higher education and most importantly, a strong

¹⁹⁹Damilola S. Olawuyi and Zibima Tubodenyefa, "Review of the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria," OGEES Institute, Afe Babalola University, Nigeria (2018). https://www.iucn.org/sites/dev/files/content/documents/2019/review_of_the_environmental_guidelines_and_standards_for_the_petrolium_industry_in_nigeria.pdf accessed March 21, 2020.

²⁰⁰Ramos, "Social Sustainability in Oil and Gas Projects."

technocracy inside and outside the Government.²⁰¹ The regulation also states about the public participation that when the impact of any petroleum project is assessed prior to commencement of the project, a draft assessment will be made available to public and a certain amount of time, which is not less than six weeks, will be allowed to the public to offer their opinion and on basis of this public opinion the final assessment report will be prepared.²⁰² Therefore, the responsibility also lies on the oil producing companies whether international or national, to ensure effective public participation. A good example in this regard is the Shell, a known oil producing company. During their operation in the Cemesea area of Peru, Shell hired environmental consultants to collect the stakeholders' and NGOs' opinions and also to engage them in meeting and workshop.²⁰³ A good contract should be effective between the local community and the operating company whether national or international. The community should have a good interaction through consultation and participation to meet their demand from the Government and the oil companies.²⁰⁴ At the approval stage of any project environmental consultants and NGOs representing the local community can play a vital role on behalf of the Government and the local community.

Public participation is not considered as a condition either in the ECR 1997 and or in the Environment Clearance procedure Guidelines in Bangladesh. At present, one of the requirements of International Financial Organisations and the donor agencies is to ensure public participation in their project especially, in the EIA process.²⁰⁵ As a result to some extent where it is done the DoE engages their proponents to ensure the public participation.²⁰⁶ In Bangladesh, the community can be involved in the natural gas operation with the operating company firstly, when land is acquired for the operation and secondly when the company creates employment opportunities and other facilities under the corporate social responsibility.²⁰⁷ In Bangladesh land acquisition is done by the Government as the article 11.1(h) of the MPSCs states that Petrobangla or in essence the Government is obligated to

²⁰¹ Indra Overland, "Norway: Public Debate and the Management of Petroleum Resources and Revenues," in *Public Brainpower Civil Society and Natural Resource Management*, ed. Indra Overland (Palgrave Macmillan, 2018). https://www.academia.edu/35367444/Norway_Public_Debate_and_the_Management_of_Petroleum_Resources_and_Revenues?auto=download. accessed on September 10, 2020.

²⁰² Regulations to Act Relating to Petroleum Activities, art.6(a).

²⁰³ Weaver, "Sustainable Development in the Petroleum Sector," 36

²⁰⁴ *Ibid.*, 37

²⁰⁵ Ingelson and Nwapi, "Environmental Impact Assessment Process," 37

²⁰⁶ River Management Improvement Programme (RMIP), *Environmental Management Framework (EMF)*, Bangladesh Water Development Board, Ministry of Water Resources, Government of the People's Republic of Bangladesh (February 2015), 17.

²⁰⁷ Ingelson and Nwapi, "Environmental Impact Assessment Process," 37

help the contractor to lease or use the land, subsoil and other areas that are required to conduct the petroleum operation subject to the applicable laws.²⁰⁸ It may hinder the real contract between the operating company and local community.

The researcher has acquire the prudent thinking of the experts of petroleum sector and different approaches of the experts are revealed as for any extraction project having contact with people is most important. Consensus of and consultation with local people is significant but it is missing in Bangladesh.²⁰⁹ The lack of proper regulation to ensure exchange of information for mutual benefit is one of the major weaknesses of the energy sector in Bangladesh.²¹⁰ The laws of Bangladesh are silent about the community consultation. This is why there is no scope to ensure it during oil and gas exploration and production.²¹¹

While it is also opined that previously community consultation was not held, at present it takes place and companies are sometimes forced to consult with the communities in natural gas operation.²¹² In such cases, a consultant is formally appointed, who prepares an EIA report and opines whether everything is alright to carry the operation. Sometimes there are allegations from the local community of the area of hydrocarbon operation against the consultant that they distort their opinion according to their need.²¹³ At present the people are more conscious and not ready to accept whatever the Government desires in the name of public interest. In this regard it is opined that

“Government should not try bulldozing an approach. They should do consult and find the best possible way not to compromise the development and at the same time take care of the community and also the environment”²¹⁴

Six respondents agree with the above statement that community consultation has not taken place and when to some extent it is followed, it is limited within the formalities and paper works.

Experts have also responded that in every big project the local people should be consulted, but it is not followed. In case of the projects with probable high risk no consultation usually takes place. In such cases the local people remain completely in the dark.²¹⁵ The community and the stakeholders with whom the consultation will be held should

²⁰⁸Model Production Sharing Contract 2019, art.11.1(h).

²⁰⁹Interview with EP1.

²¹⁰Interview with EP4.

²¹¹Interview with AC1.

²¹²Interview with AC2 and EP1.

²¹³Interview with AC2.

²¹⁴Interview with AC1.

²¹⁵Interview with EP2 and ENV2.

have adequate knowledge about the project; otherwise it becomes meaningless as without proper understanding of the impact on environment of a project they will not be able to provide their opinion. Sometimes their opinions are not properly evaluated. In most of the cases the community consultation is conducted without disclosing all the facts to the community concerned.²¹⁶ Sometimes root level consultation does not occur and participation of community and stakeholder are not properly ensured.²¹⁷

Two of the respondents have expressed that the local communities are consulted and the consultation is conducted not by the Government but by the IOCs. In this case, they follow any of the three guidelines: the guidelines of the host country where they operate, or guidelines of the home country where they are registered, or guidelines adopted by the IOCs. The IOCs are always in fear of compensation and try to follow the environmental rules and regulations strictly, but in a country of weak regulatory frameworks these guidelines are not strictly maintained. Whatsoever, they are successful to convince the people by properly handling some common environmental hazard. Unfortunately, sometimes large IOCs, with which the contracts are signed, assign it to weak companies and these weak companies do not comply with the environmental requirements properly.²¹⁸

Two of the respondents have said that before starting any project EIA is done but no community consultation is conducted as the local people are very much interested in exploration and production of natural gas in their areas. They enthusiastically inform the authority about the discovery (probability) of gas field or any new information regarding this.²¹⁹ The reason behind the interest is that there are opportunities of installing some facilities for the benefit of the local people by the operating company under the corporate social responsibility. They are compensated, medical facilities are introduced, employment opportunities are created and local people get the priority, which ultimately make them very happy.²²⁰

From the above discussion the researcher has come to a conclusion that the community consultation and public participation process in natural gas operation is not adequate in Bangladesh and one of the reasons behind this is the lack of legal obligation. The Government should take initiatives to ensure effective community consultation and public

²¹⁶Interview with EP3.

²¹⁷Interview with ENV2.

²¹⁸Interview with ENV 1.

²¹⁹Interview with GO1.

²²⁰Interview with GO2.

participation in decision making process with proper monitoring system to meet the SDGs and to ensure sustainable development of natural gas in Bangladesh.

5.6 ACCESS TO INFORMATION AND GOOD GOVERNANCE

Petroleum exploration and production by nature is not necessarily sustainable practice throughout the world.²²¹ Public interest is increasing in many developing countries regarding environment degradation resulting from the petroleum operation.²²² A research has shown that the companies operating in developing countries disclose very little amount of social and environmental information and the scenario of Bangladesh is similar.²²³ In this situation voluntary report on sustainability to ensure the sustainable practice of some petroleum operating companies is considered the major platform to convey both the positive and negative information of an operation and to help collect information to influence the policy.²²⁴ To this end a number of international instruments such as the United Nations Global Compact and Global Reporting Initiatives provide some guidelines. The UN Global Compact embodies ten principles regarding the human rights, environment, labour and anti-corruption. Among these principles three are related to the environment and applicable for petroleum operating companies. These are

Principle 7: Businesses should support a precautionary approach to environmental challenges

Principle 8: Undertake initiatives to promote greater environmental responsibility

Principle 9: Encourage the development and diffusion of environmentally friendly technologies.²²⁵

These principles are interrelated with the sustainable petroleum operation in any country that imposes obligation on disclosure of related information in public to attain the confidence of the public on the operating companies and concerned project. Another such instrument is the Global Reporting Initiatives (GRI) that was established in 1997 with a view to promoting economic, social and environmental sustainability reporting. To this end, the instrument provides some guidelines to the operating companies to comply with to ensure the

²²¹Tatsuya Nakagawa, "Sustainability in Oil & Gas Production and Exploration: Voluntary Sustainability Reporting," <http://www.castagra.com/2013/10/sustainability-in-oil-gas-production-exploration-voluntary-sustainability-reporting/>

²²²Muhammad Azizul Islam and Muhammad Aminul Islam, "Environmental Incidents in A Developing Country and Corporate Environmental Disclosures: A Study of A Multinational Gas Company," *Society and Business Review* 6, no.3 (2011): 229-248.

²²³Islam and Islam "Environmental Incidents in A Developing Country"

²²⁴Nakagawa, "Sustainability in Oil & Gas Production"

²²⁵Global Compact, "The Ten Principles of the UN Global Compact," United Nations Global Compact, available at <https://www.unglobalcompact.org/what-is-gc/mission/principles> accessed on April 4, 2020.

transparency and accountability from the angle of sustainable development.²²⁶ The oil and gas sector supplement of the GRI is the reporting guidance for the operating companies and it comprises a number of issues following which the industry will be able to manage the impact and opportunities by disclosing them and be held accountable to the interested stakeholders.²²⁷ However, the Government discloses very little project information and social environment to public and affected stakeholders.²²⁸

In Bangladesh, the access to information is not ensured either by the Petroleum Act or the production sharing contract. Article 26.7 of the MPSC of 2008 clearly states that “Either Party may disclose any such information to its employees, Affiliates, Consultants, Sub-contractors or others to the extent required to efficiently conduct Petroleum Operations provided it obtains from such individuals or entities prior to disclosure a written confidentiality undertaking no less restrictive than the obligation of the disclosing Party under this Article”.²²⁹ The logic behind this is that the petroleum contract has some commercially sensitive information²³⁰ but how far it will remain confidential is a matter of concern as the confidentiality should remain till the bidding and negotiation round but after signing the contract the confidentiality may not be reasonable. As before signing the contract, the company may be affected by the disclosure but after signing the contract there is no possibility of harm to the company’s competitive position.²³¹ Rather the disclosure of the full text of the contract in public may reduce rumor, which will be beneficial for both the Government and the company.

Article 26.9 of the MPSC of 2008 provides that all data and information are strictly confidential and the confidentiality will be continued even after the termination of the contract for a period of 5 years.²³² It is a barrier in the way of ensuring public participation. Knowing the information after the termination of the contract will not carry out any meaningful purpose. Some data and information related to the management of environment and social impact of the project are very significant and they should be available to the

²²⁶ Sustainable Performance, *Global Reporting Initiative*.<https://www.sustainable-performance.total.com/en/reporting/reporting-standards/global-reporting-initiative-gri> accessed on June 6, 2020.

¹⁰³⁵ Nakagawa, “Sustainability in Oil & Gas Production.”

²²⁸ Alba, *Environmental Governance in Oil-Producing Developing Countries*

²²⁹ Model Production Sharing Contract 2008.

²³⁰ Rob Pitman and Anne Chinweze, “The Case for Publishing Petroleum Contracts in Nigeria,” Natural Resources Governance Institute, (March 2018), 1-16.
<https://resourcegovernance.org/sites/default/files/documents/the-case-for-publishing-petroleum-contracts-in-nigeria.pdf> accessed on January 25, 2020.

²³¹ Pitman and Chinweze, “The Case for Publishing Petroleum Contracts,” 1-16.

²³² Model Production Sharing Contract of 2008

public. It requires the publication of the full text of the contract along with its annexure to understand the details about the contract and there should be no confidentiality clause. The Provision of five years' time span after the termination of the contract before it is made public should be amended. The contract should be available just after the signature, because, as the terms and conditions are already determined there is no possibility of changing the contract. Moreover, some of the assessments of the social and environmental impact and its mitigation process are updated from time to time considering their impact, and the disclosure of the contract may help the operating company to find out probable initiative to deal with the new situation keeping the public opinion under consideration within the defined term. MPSC of 2019 still comprises such kind of confidentiality provisions despite the existence of the Right to Information Act 2009. The objective of the Act was that

The right to information shall ensure that transparency and accountability in all public, autonomous and statutory organisations and in private organisations run on government or foreign funding shall increase, corruption shall decrease and good governance shall be established. It is expedient and necessary to make provision for ensuring transparency and accountability.²³³

The Right to Information Act 2009 deliberately expresses the State's view towards accessing and disclosing information. It is acknowledged that without access to information good governance is not possible and it leads to corruption. To ensure the transparency and accountability of any organisation, information should be accessed by the public as all the power belongs to the people and their empowerment is possible through ensuring the right to information. This is one of the significant Acts to ensure the transparency and accountability of any organisation including the government organisations, NGOs and autonomous and other bodies run by government and foreign funding. The enactment of this Act was a remarkable step in the way to good governance. The authorities authorised to disclose the information also include any statutory body or institution established by or under any Act. Within this ambit, Petrobangla and DoE are included. The term information is defined in section 2 that

“Information is in relation to an authority's constitution, structure and official activities and includes any: memo, book, design, map, contract, data, log book, order, notification, document, sample, letter, report, accounts statement, project proposal, photograph, audio, video, drawing, film, any instrument prepared through electronic process, machine readable documents and any other documentary material regardless of its physical form or characteristics.”²³⁴

²³³The Right to Information Act 2009, Government of the People's Republic of Bangladesh.

²³⁴The Right to Information Act 2009, s 2.

It implies that contracts that are made between the Government and the IOCs or any national company, their account statement and report of EIA can be considered as information. Section 4 of this Act recognises the right to information of the citizen from the authority. Section 5 of this Act entails the authority to computerise the information those are subject to computerisation within reasonable time and connect those to the network to ensure the access of the public to the information. These are very up to date provisions to adapt to the changing situation. However, in practice it is different. The EIA report is very crucial and related to public interest but no EIA report of the petroleum project is easily accessible to public. Moreover, the MPSC itself comprises the confidentiality clause. Though the MPSCs of 2012 and 2019 were revised after the enactment of the Right to Information Act 2009, no amendment of the confidentiality clause has taken place in them. It may seem that the presence of the confidentiality clause of the MPSCs is in contradiction with the Right to Information Act. It is mentionable that section 7 of the Act consists of a list of information that are not subject to access, and the list includes the information related to commercial and business confidence. Now, it may provide the petroleum governing authority with the opportunity to avoid publishing the contract and the related report on the ground of being subject to commercial confidence. The very purpose of this Act may be questioned due to the presence of such a provision. The term business and commercial confidence is not specified elaborately. It may be one of the reasons why full text of the contract, EIA report, their mitigation process, and audit report are not published. Proper initiatives should be taken to publish the full text contract along with its annexure and related environmental management report within specified period after the signature of the contract as there is no possibility to harm the commercial confidentiality after signing the contract. If the negotiators are aware that the contract will be made public and be subject to legal, public and commercial scrutiny, then the company and the regulating authority will be more conscious to draft the contract that will serve the interest of both the company and the country.²³⁵ Besides, Government also may be under obligation to create pressure on the company if the contracts are subject to public scrutiny.²³⁶

Access to information can also be ensured by maintaining a web page for a specific project. One of the good examples in this regard is that Shell, the aforementioned oil company, during its activities in a specific region of Peru maintained a web page that

²³⁵Pitman and Chinweze, "The Case for Publishing Petroleum Contracts," 1-16.

²³⁶Afrin, "Foreign Direct Investments and Sustainable Development in the Least-Developed Countries"

harboured the briefing papers, anthropologist report, EIA report, consultations with the indigenous people and their speeches.²³⁷ In the same project, the Government also monitored its environmental compliances, which Shell requested to make public. Some of the most transparent countries disclose their information regarding the graphical boundary of the operating area, protection of environment and social obligation such as the employment opportunity, training requirement and local content. Dissemination of information helps the local community to understand their role in the project and how the project will affect their lives.²³⁸ Mexico is the glaring example in this regard as its National Hydrocarbon Commission developed a web portal to maintain a web page for every petroleum project containing details about the contract in full text, work programme, procurement procedure, local content and environment related studies including EIA and management plan.²³⁹ The regulation of Norway that governs the petroleum activities clearly states that, the announcement of consultant about the assessment of environmental impact shall be made in the official gazette of Norway. The impact assessment and other relevant background data will be available in the internet to seek opinion on it and upon consideration of those comments the decision is made final.²⁴⁰

In Bangladesh, Petrobangla publishes an annual report containing the number of blocks and allotment of the number of block to the IOC or the BAPEX or joint venture. Petrobangla also publishes reports regarding the production and reserve. Terms and conditions of the signed contracts and environmental management system are yet to be included in the publication list. Moreover, in case of any blowout it is pertinent to clean up and restore the area to increase the quality of the environment, but there is no mechanism to disseminate the information related to impacts on the environment resulting from such blowouts.²⁴¹

The fourth pillar of sustainable development is good governance,²⁴² without which the social, economic and environmental development is not possible. Moreover, a decent and public Government is one of the significant elements to ensure the accountability and

²³⁷Weaver, "Sustainable Development in the Petroleum Sector," 36.

²³⁸Pitman and Chinweze, "The Case for Publishing Petroleum Contracts," 1-16.

²³⁹Pitman and Chinweze, "The Case for Publishing Petroleum Contracts," 1-16.

²⁴⁰Regulations to Act Relating to Petroleum Activities, s. 22(a).

²⁴¹Ibama Brown and EyengheTari, "An Evaluation of the Effects of Petroleum Exploration and Production Activities on the Social Environment in Ogoni Land," *Nigeria International Journal of Scientific & Technology Research* 4, no.4 (April 2015): 273-282.

²⁴²Anis and Siddiqui, "Issues Impacting Sustainability," 115-124.

transparency of the petroleum sector.²⁴³ In addition, transparency is necessary in every sector of the Government and it can be ensured through access to information. Sometimes the judiciary does not act in good faith in some developing countries. In case of noncompliance with environmental law and contractual obligation, weak and corrupt judiciary creates hindrances towards making the oil producing industries accountable. Nigeria and Myanmar are good examples in this regard. These two countries brought their suits against the Shell Oil and Unocal respectively in the court of the USA, instead of their own countries.²⁴⁴

In Bangladesh the purpose of the Petroleum Act is affected by some instances of corrupt practice which is revealed from the Niko case where the then State Minister for Power and Energy of Bangladesh received bribe from Niko and the company was convicted under the Corruption of Foreign Public Officials Act of Canada enacted in 1998.²⁴⁵ The writ petition number 5673 of 2016 also states about the corruption involved in the Niko case.²⁴⁶ However, the judiciary of Bangladesh played very significant role through their impartial judgment and order in the writ petition filed following the blowout in Tengratila. Realising the importance of transparency and good governance many countries of the world including some African countries like Congo, Mozambique, Ghana, Guinea, Liberia, Senegal, Mali and Mauritania now publish their petroleum industry contract to ensure good governance in the petroleum sector.²⁴⁷ There exists The Extractive Industries Transparency Initiative (EITI), for promoting the easily accessible and accountable management of petroleum and mineral resources. The EITI is considered as a global standard and it tries to strengthen public and corporate governance, encourage transparency and accountability in the petroleum and mining sector. The initiative requires the disclosure of information regarding natural resource management and its extraction process and how it benefits the public.²⁴⁸ Bangladesh should also be part of such initiatives to ensure transparency and to avoid unwanted circumstances.

The researcher has consulted various experts regarding this issue and different views came forth. For convenience, the views are discussed under three headings.

²⁴³Anis and Siddiqui, "Issues Impacting Sustainability," 115-124.

²⁴⁴Weaver, "Sustainable Development in the Petroleum Sector," 37.

²⁴⁵Greg McArthur, "Niko Resources: Ottawa's Corruption Test Case," *The Globe and Mail*, August 25, 2011. <https://www.theglobeandmail.com/report-on-business/rob-magazine/niko-resources-ottawas-corruption-test-case/article542842/accessed on January 18, 2020>.

²⁴⁶Paragraph 4 of the judgment of the writ petition number 5673 of 2016.

²⁴⁷Pitman and Chinweze, "The Case for Publishing Petroleum Contracts," 1-16.

²⁴⁸EITI is a global initiative having 55 partner countries agreed to disclose their relevant information. For details please visit eiti.org

5.6.1 Availability of Information

Number of experts have opined that access to information was not available beforehand but now it is.²⁴⁹ Specific information may be supplied by Petrobangla but in the upstream sector as the IOCs are involved, some information cannot be published.²⁵⁰ Legally one can seek information under the Right to Information Act but there are a lot of hurdles to get information related to oil and gas operation.²⁵¹

Another opinion has emerged that the government agencies like Petrobangla are very mean and sometimes non-cooperative on the issue of exchanging or releasing data. A lot of data exist in the data centre of Petrobangla, submitted by the IOCs during their previous operation, but not even BAPEX has access to these data. This approach hinders the exploration activities and these data remain as idle data in petro centre.²⁵² The research personnel or research students also have no access to data of Petrobangla for their research purpose and this situation is rare in any country of the world as the exploration venture is formed by the collaboration of academics and industry.²⁵³ As in Bangladesh the Right to Information Act is in operation and according to this Act all big projects have to be informed to public but due to probability of high risk associated, details of these projects are not made known to the public.²⁵⁴ Considering the significance of the access to information and the reluctance of the government agencies to share the information it is also opined that

When there was no information flow, people didn't know anything. They (the government agencies) could say anything and people would have believed it. Now it is not possible. So the best way is to be transparent. It is very important to be transparent and allow information to flow. ... general public cannot get any data even the researchers ...they can't go. They hide everything in the name of national interest and other things.²⁵⁵

As the reason of not disclosing the information it is articulated that all the information related to environmental concern of petroleum operation are not disclosed as the local community may be in fear considering its negative impact; but it should be disclosed.²⁵⁶ A different view expresses that “Nothing is done beyond the clauses of the MPSC. The MPSC is open to all. Only the financial bidding is kept confidential because of relevant cause. Only

²⁴⁹ Researcher interviewed with ENV1.

²⁵⁰ Researcher interviewed with PE1.

²⁵¹ Researcher interviewed with AC1.

²⁵² Interview with EP4.

²⁵³ Interview with EP4.

²⁵⁴ Interview with EP2.

²⁵⁵ Interview with EP1.

²⁵⁶ Interview with AC2.

biddable items are kept confidential, because the other companies may claim the same facilities as is given to the other ones in earlier cases.”²⁵⁷

5.6.2 Transparency

To ensure the good governance the transparency of the controlling authority is very significant and in this regard opinion of the respondents represent that the transparency mechanism of Petrobangla is not incorporated in the Bangladesh Oil, Gas and Mineral Corporation Ordinance, 1985 and a number of allegations against Petrobangla regarding corruption are found in the news reports.²⁵⁸ According to a number of respondents Petrobangla is not transparent enough,²⁵⁹ as accounts of the IOCs are not audited by the audit department of the Government though every government expenditure is subject to government audit. The accounts of IOCs are audited by Petrobangla who approves the budget.²⁶⁰ It is also opined that though the government audit department sent a team to go through the wasteful expenditure of IOCs in 2009 that are subject to cost recovery, Petrobangla did not cooperate to access the account.²⁶¹ Regarding this, the comment of EP1 can be mentioned again where the respondent expresses his concern about the transparency of Petrobangla, claiming that in Petrobangla transparency is zero, and even the researchers are not allowed access to the data in the name of national interest and other things.²⁶²

Nine respondents are of the opinion that the transparency of Petrobangla are not enough and sometimes minimum standard too is not maintained. To ensure the transparency, the people have to be conscious and without public consciousness it cannot be ensured.²⁶³

On the contrary a completely different view appears in an opinion that

The IOCs appoint a separate firm to audit the account. Every year they have to submit the work programme and budget. Petrobangla examines all the categories of expenditure for allocation of budget. After completion of the work, the company also submits the actual expenditure. Prior to buying anything the company has to get the proposal approved by Petrobangla. Petrobangla reviews the proposal and claims explanation if necessary. The inventory of the purchased things is prepared and it is audited by the external auditor. In such a way the accountability and transparency are ensured.²⁶⁴

²⁵⁷Interview with GO2.

²⁵⁸Interview with AC1.

²⁵⁹Interview with AC1,AC2,AC4,EP1 EP2 and EP3.

²⁶⁰Interview with AC2.

²⁶¹Interview with EP5.

²⁶²Interview with EP1.

²⁶³Interview with EP3.

²⁶⁴Interview with GO2.

Four respondents have commented that there is no legal obstacle to ensure transparency of the government organisation Petrobangla. It is noticeable that out of these four respondents three are the government officials.

5.6.3 Accountability

In this issue it is opined that Petrobangla is accountable to Ministry of Power, Energy and Mineral Resources but there is no oversight mechanism.²⁶⁵ Accountability of Petrobangla is not adequate enough, because there is a number of mistakes and mismanagements done by this department, but there is hardly any probe or punishment except a few.²⁶⁶ It is also opined that

“On the management side Petrobangla failed often to appear accountable for vital issues with respect to upstream petroleum exploration”.

The accountability of Petrobangla cannot be ensured as the Chairman and high officials of Petrobangla are not from Petrobangla itself, rather they are appointed from other departments who have merely any liability to Petrobangla. After a certain period they no longer remain in Petrobangla. Another matter of concern is that the Petrobangla personnel are also not completely independent to perform their function,²⁶⁷ and one of the reasons behind this is sometimes the political pressure.²⁶⁸ After the enactment of Speedy Power and Energy Supply Act 2010 the authority of energy ministry is increased.²⁶⁹ Even the contracts that are signed under this Act are without any tender and therefore, transparency is not ensured.²⁷⁰ The Petrobangla has to work according to government decision and sometimes foreign investment is also a matter of concern to the Government.²⁷¹ It is suggested that Petrobangla personnel having experience and knowledge and persons with working experiences in various companies should be appointed in Petrobangla to increase the capability of Petrobangla in decision making. It is also opined that to ensure the accountability and transparency not only in petroleum sector but also in every sector of Bangladesh ombudsman should be appointed.²⁷²

In 2015 bidding process was conducted by Petrobangla for 2D seismic multiclient survey for exploration in sea blocks and a particular contractor was selected by the expert

²⁶⁵Interview with AC1.

²⁶⁶Interview with PE1 and EP2.

²⁶⁷Interview with AC1 and EP2.

²⁶⁸Interview with AC4.

²⁶⁹Interview with EP2.

²⁷⁰Interview with EP2.

²⁷¹Interview with EP2.

²⁷²Interview with AC2 and AC5.

committee. The approval of ministry was required to start the work, but though this process was stopped for unknown reason, Petrobangla was not held accountable for this. Instead Petrobangla went for second round bidding for the cancelled work which also took years and Bangladesh wasted 4 years of vital time to initiate offshore exploration while by this time Myanmar, an adjacent country of Bangladesh, discovered several offshore gas fields. While media attempted to collect information from Petrobangla, they found only lack of transparency and accountability.²⁷³ In the bidding round the MPs (Member of Parliament) and legal representatives may get involved to ensure the public interest by diminishing any undue influence. There should be a provision ensuring the accountability of Petrobangla and that should be made public.²⁷⁴

Eight respondents have opined that the accountability of Petrobangla is not properly ensured and two respondents have expressed that there are some lacking in the present accountability system of Petrobangla.

Another view is also expressed that

As a government owned organisation Petrobangla follows government rules and regulations in performing its function. Petrobangla maintains accountability and transparency by providing energy related information to the Government and public as required.²⁷⁵

Five of the respondents have expressed their satisfaction with the accountability of Petrobangla and in this case also three are government officials.

From the above views it can be concluded that the access to information in the natural gas sector of Bangladesh is not properly ensured; rather one has to face difficulty to acquire information. As to the issue of transparency and accountability, a number of allegations are raised by the respondents against Petrobangla and other controlling authorities. It is also revealed that the working environment of Petrobangla is not satisfactory as the employees are not completely independent to perform and decide. Different views also were expressed by the government officials that the accountability and transparency of Petrobangla are properly ensured because the information of the MPSCs according to which the contract is signed are available to all. Some financial terms and conditions are not published for business interest of the participating company. The researcher has already discussed that the information related to commercial and business interest are not subject to disclosure and under this criteria the actual contract may not have been not published. To ensure the access to information the

²⁷³Interview with EP4.

²⁷⁴Interview with ENV2.

²⁷⁵Interview with GO4.

commercial and business confidentiality should be specific and the confidentiality period should be reasonable because the MPSCs incorporate the confidentiality period of five years after the termination of contract.

5.7 COST BENEFIT ANALYSIS

"The fabric of life is unraveling, but the vast majority of people are unaware of it. The economies and technologies of this century have provided us with standards of living that past Kings could have only dreamt of, but they have come at the cost of natural capital-destroying and dispersing a one-time bonanza of fossil fuels, other minerals, soils, biological diversity and fresh water. The impact of the earth's dominant animal now threatens the ecological life-support systems that underpin the human economy."²⁷⁶

The upstream activities require a huge amount of investment as the cost of an exploratory well ranges between US\$ 1million to 35million.²⁷⁷ The cost benefit should be analysed at every phase of natural gas operation. In the very beginning of the production stage the operating authority has to assess the GIIP²⁷⁸ to check whether the production will be economically and environmentally feasible or not, as this stage requires a huge amount of investment.²⁷⁹ Environmental cost of petroleum operation is one of the crucial factors that should be taken into consideration by the investor. The environmental cost includes compliance with the environmental legislation, insurance cost for any blowout and environmental damage, disposal cost of petroleum wastage, cost of conducting EIA, mitigation and monitoring thereof and abandonment and decommission cost.²⁸⁰ Abandonment and decommission is considered as one of the significant phases of the operation and is held after the achievement of the economic limit from the gas recovery. It requires the well to be properly plugged to avoid the leakage into the ground water that leads to higher cost onshore than offshore.²⁸¹ In this case, the cost of the entire project should be calculated in an efficient way to minimise the environmental harm and maximise the economic benefit. However, to balance among profit, financial cost and environment is a very complex task.²⁸² Research reports suggest application of the green accounting method where the cost of environmental damage is deducted from the national Gross Domestic Product (GDP). For example, the Japanese economic planning agency conducted a study and

²⁷⁶ Paul R. Ehrlich, forward to Hunter et al., *International Environmental Policy* (2ed.2002) cited in Afrin, "Foreign Direct Investments and Sustainable Development in the Least-Developed Countries"

²⁷⁷ OPEC, *I need to know: An Introduction to the Oil Industry and OPEC*

²⁷⁸ Gas Initially in Place

²⁷⁹ Gang Lu et al., *Gas Sector Master Plan 2017*, 123-124.

²⁸⁰ Faruque, "Stability in Petroleum Contracts: *Rhetoric and Reality. (Lessons from the experiences of Selected Developing Countries and Economies in Transition (1980-2002),*" 205.

²⁸¹ Weaver, "Sustainable Development in the Petroleum Sector," 12.

²⁸² Jia Li et al, "Decommission in Petroleum Industry: Current Status, Future Trends and Policy Advices," *IOP Conference Series.: Earth and Environmental Science*. 237no.4 (2019): 1-6.

concluded that in 1990, the air, water and ecosystem damage cost was US\$ 100 billion which is 2% of the GDP.²⁸³

In this regard, a fund can be created to indemnify the environmental damage. MPSC of Belize, which was adopted in 2000, can be an example, which incorporated in its contract the provision of contribution of one-tenth of the one percent of the price of the gross annual production by the contractor in a fund managed by the Government to indemnify any or all environmental damage caused during the petroleum operation.²⁸⁴

Considering the negative impact on the environment many countries also have introduced the tax or levies to support the conservation of environment. For example, in Iran all kind of private companies dependent on natural resources for their operation such as the mining company must pay 1% of the their annual revenue to carry on the anti pollution measures.²⁸⁵ The MPSCs of Bangladesh incorporate the provision of the insurance coverage but in most of the cases the provision used to indicate the pollution does not cover all the impacts resulting from the operation and blowout. However, the largest IOCs often do not purchase the most inclusive insurance to cover the potential liability of pollution that result in major environmental harm and liabilities.²⁸⁶ However, Bangladesh formulated the National Environment Policy (NEP) 2018, which requires that the evaluation of environmental and ecological value also have to be assessed to evaluate the economic development. It also suggests to ensure the net development which can be ensured by undertaking development activities in such a manner that is not harmful to environment and does not decrease the productivity of environment and ecology.²⁸⁷ It actually suggests to make a cost benefit analysis that requires the enactment of new laws so the concerned department will be under an obligation to analyse the economic benefit and environmental cost of that very project. The petroleum operation has some negative impacts on the environment and it is also acknowledged by the NEP. It requires that petroleum laws should be amended in the light of sustainable development including the effective provision of cost benefit analysis.

The precautionary approach can be applied to cost benefit analysis. To this end the controlling authority should balance between the potential of petroleum discovery and the

²⁸³Weaver, "Sustainable Development in the Petroleum Sector," 12.

²⁸⁴Tienhaara, "Foreign Investment Contracts in the Oil & Gas Sector," 15-20.

²⁸⁵National Biodiversity Strategy and Action Plan of Bangladesh 2016-2021, 78.

²⁸⁶Hasson, "Deep Water Offshore Oil Exploration Regulation: The Need for a Global Environmental Regulation Regime," 277-303.

²⁸⁷National Environment Policy, art. 3.24.7 and 3.24.8.

probable environmental damage.²⁸⁸ The NEP of Bangladesh also encourages the precautionary measures as it states that the preventive measures will be prioritised over curative measures.

The researcher has inquired into the opinion of the experts as to the practice of cost benefit analysis in natural gas operation and the opinions are mainly focused on the economic cost benefit analysis. For the benefit of discussion the approaches are presented under two headings.

5.7.1 Economic Cost Benefit Analysis

In addressing this issue experts have opined that the rate in which gas is purchased from BAPEX is lower than the price it is purchased from IOCs and the price varies from IOC to IOC. Production through national oil company is cost effective but there are hindrances in the way of the national company's being self-sufficient. However, the Gas Development Fund of 2012 is a great initiative of the government to increase exploration through BAPEX.²⁸⁹ The operational cost of the IOCs is 10 to 30 times higher than the NOC for the extraction of same amount of gas. As a result, operating through the NOC is cost effective than the IOCs or sub contractors. The production cost of Gazprom is 2.5 to 3 times higher than BAPEX. If the cost benefit was properly analysed then the decision of gas production from Bhola field should have been in favour of BAPEX but it went in favour of Gazprom as the decision might not have been taken considering proper cost benefit analysis. The reason behind this is the lack of transparency in the contract signing process. Moreover, comparative analysis was absent and Gazprom was being considered to have a contract with.²⁹⁰ It has also been expressed that

The cost effectiveness ...there is a cost of discovery per unit of gas, cost of discovery of any area needs to be averaged and it varies from zone to zone. In Bangladesh, cost of discovery is one, in Norway there is another cost of discovery. Replacement cost or cost of new finding of gas changes with time. I am not sure whether such cost analysis is done for Bangladesh.... In fact there is no exploration for last 15 years.²⁹¹

Another view also have expressed that in any project the economic cost benefit is analysed, which means that the amount of cost, the duration of recovery of the cost, the profit thereof etc. are calculated.²⁹² It is also mentioned that gas from any field will be extracted

²⁸⁸Hasson, "Deep Water Offshore Oil Exploration Regulation: The Need for a Global Environmental Regulation Regime,"277-303

²⁸⁹Interview with AC2.

²⁹⁰Interview with EP2.

²⁹¹Interview with EP1.

²⁹²Interview with ENV2.

only if the extraction becomes profitable. The analysis is done by the company as well as by Petrobangla.²⁹³ Besides, it is opined that “At the same time cost and benefit calculation of MNC operation are not being public, the entire operation is being run in a non-transparent way.”²⁹⁴

5.7.2 Environmental Cost Benefit Analysis

Environmental cost benefit analysis has been incorporated as a policy in 2018 in Bangladesh, but it is not in effect that much. However it is opined that environmental cost benefit analysis is not done in any sector of Bangladesh.²⁹⁵ The amount of gas burnt in two blowouts of Magurchara and Tengratilla is equal the amount needed to generate electricity for two years for Bangladesh.²⁹⁶ Environmental harm is not calculated in Bangladesh, which is evident from the fact that no initiative is taken to address the gas leakage that resulted from a blowout in Sylhet in 1962.²⁹⁷ In case of blowouts such as the Tengratilla blowout, the actual environmental cost is not analysed. During the cost benefit analysis the natural inhabitants’ loss has to be emphasised.²⁹⁸ To sustain the economic benefit evaluation of environmental and social impact has to be emphasised.²⁹⁹ The restoration part of petroleum project is often ignored. Tree plantation is not a solution, as it takes a hundred years to develop an ecosystem. After destroying a prominent forest, planting trees is not the solution.³⁰⁰

From the opinion of various experts it is evident that in Bangladesh neither the economic nor the environmental cost-benefit is analysed in a prudent way to ensure the public interest of the country and to ensure the long lasting benefit. The environmental cost of the blowouts is not mentioned by the experts. It is shown and discussed in the fourth chapter that though a huge amount of environmental damage resulted from the two blowouts, no initiative of the concerned authority is found to incorporate provision of environmental cost benefit analysis in any MPSC. The latest MPSC has been revised in 2019 after the adoption of the National Environmental Policy of 2018 which incorporates the provision of environmental cost benefit analysis. Reflection of the provision of environmental cost benefit analysis is absent in this latest MPSC.

²⁹³Interview with PE1.

²⁹⁴Interview with EP5.

²⁹⁵Interview with AC5 and ENV2.

²⁹⁶Interview with EP2.

²⁹⁷Interview with ENV1.

²⁹⁸Interview with ENV2.

²⁹⁹Interview with AC2.

³⁰⁰Interview with ENV2.

5.8 CONSERVATION FOR FUTURE GENERATION

Conservation for future generation is one of the significant indices for conducting the sustainable natural gas operation, which represents the intergenerational equity as one of the principles of international law of sustainable development. The working group of Germany has prepared a set of principles regarding the conducts of Petroleum Company and have recognised the essence of conservation for future generation addressing intergenerational equity. It states that “Companies should effectively integrate ecological, social and economic considerations in their activities such that the needs of future generations are protected in the process of meeting the needs of the present generations” as the role of the fossil fuel is continued to be of paramount importance for the wellbeing of the world economy.³⁰¹ The Secretary General of OPEC, Abdalla Salem El-Badri, commented in a conference on April 2016 in Paris that “Fossil fuels remain abundant and are necessary for our future, just as they have been an essential of our past.”³⁰² So the exploitation of petroleum resources is emphasised in such a manner that the future generation will not be in crisis to meet their need compared to present generation. The depletion of petroleum resources is inevitable, that is why some of the countries have adopted the principle of creating trust fund with a certain amount of revenues earned from this sector for the benefit of future generation. Nigeria, which is famous for Dutch Disease, saves a nominal amount for the upcoming generation and the amount was more than five hundred billion dollars till 2017.³⁰³ Actually, it looks like a luxurious step for the developing countries like Bangladesh because, it decreases the rate of investment that is available for the present requirement.³⁰⁴ In Bangladesh, Petroleum resource available for present generation is not sufficient to meet their need. As Bangladesh is not in a position to save an amount for the future generation, so responsibility lies on the present generation not to exploit the resources in such a manner and leave such an ecological condition that makes the journey of the future generation difficult financially and environmentally. The technological developments provide more advantages to the present generation to balance future risk and danger.³⁰⁵ Moreover, it is the responsibility of the present to leave the earth for the future generation not too worse than it received from its

³⁰¹ Fossil fuels and the future, OPEC Bulletin Commentary April 2016

³⁰² Abdalla Salem El-Badri, 17th International Oil Summit in Paris in April 2016

³⁰³ Dike, “Decommissioning and Abandonment of Oil and Gas Facilities”

³⁰⁴ Weaver, “Sustainable Development in the Petroleum Sector,” 12.

³⁰⁵ Hemen Philip Faga and Uguru Uchechukwu, “Oil Exploration, Environmental Degradation and Future Generation in the Niger Delta: Options for Enforcement of Intergenerational Rights and Sustainable Development through Legal and Judicial Activism,” *Journal of Environmental Law and Litigation* 34 (September 2019): 185-218.

predecessor.³⁰⁶ The negative impact on the environment resulting from the petroleum operation depends on the size of the extractive areas, its sensitivity, technology used, the impact on ecology and biodiversity and institutional capacity for the protection of environment.³⁰⁷ The environmental philosophers have found out three principles for the intergenerational ecological equity, and these are the conservation option, equity and access.³⁰⁸ To ensure a healthy future for the upcoming generation it is essential to make a balance between exploitation of petroleum resources and environmental degradation resulting from the petroleum operation. Otherwise the next generation will be deprived from enjoying a similar or better earth than the current generation have. The various blowouts that take place during the petroleum operation and the environmental harm that is caused for non compliance with the good oil field practice should properly be addressed through realising adequate compensation from the operator for restoration of the environment. It would be beneficial for the upcoming generation.

Bategeka and Mawejje³⁰⁹ have argued that the intergenerational equity in petroleum sector can be ensured through strong legal regime, independent institutions, transparency in government activities, communication, efficient management of public fund and responsible management practices of environment. There is no explicit policy to ensure the intergenerational equity in petroleum sector in Bangladesh. There is also another fact that available petroleum is not adequate to meet the present need of the country. This may be a good reason for not paying attention for conservation for future generation. The national energy policy 2004 suggests to adopt the conservation measures emphasising rational and economic use of energy and to this end enforcement of Energy Audit Cell and enactment of Energy Conservation Act were also recommended by this policy.³¹⁰ Initiative has yet not been taken to address the conservation of non-renewable resource like natural gas by the Government. Bangladesh is considered as natural gas prone area and petroleum resource of Bangladesh is mainly natural gas. Once the gas is produced it has to be utilised as the option

³⁰⁶Faga and Uchechukwu, "Oil Exploration, Environmental Degradation and Future Generation in the Niger Delta: Options for Enforcement of Intergenerational Rights and Sustainable Development through Legal and Judicial Activism," 185-218.

³⁰⁷Lawrence Bategeka and Joseph Mawejje, "Accelerating Growth and maintaining Intergenerational Equity using Oil Resources in Uganda," Economic Policy Research Centre (EPRC), Makerere University (2013). <https://eprcug.org/research/education/9-accelerating-growth> accessed on February 15, 2020.

³⁰⁸Faga and Uchechukwu, "Oil Exploration, Environmental Degradation and Future Generation in the Niger Delta: Options for Enforcement of Intergenerational Rights and Sustainable Development through Legal and Judicial Activism," -218

³⁰⁹Bategeka and Mawejje, "Accelerating Growth and maintaining Intergenerational Equity using Oil Resources in Uganda"

³¹⁰National Energy Policy, para. 7.17 and 7.18.

for storing is not available. This is why the controlling authority has to decide in a more prudent manner as to how many fields will be in operation simultaneously. Since it is a non-renewable resource, after its depletion the country has to find out an alternative. In fact, it may not be a judicious decision to exploit from maximum number of fields without considering the needs of future generation. There is an essence of consensus among the controlling authority, Government and other stakeholders that the petroleum resources should be sustained for future generation.

The researcher has sought the experts' prudent opinion regarding the conservation of natural gas for future generation as its depletion is inevitable. Various opinions have been expressed, for example, the importance has to be given on exploration as till now there is much to explore and beside the exploration of conventional gas, attention should also be paid to unconventional gas and it may be an alternative as the traditional reserve takes a huge amount of time to make reservoir and the existence of source rock for unconventional gas is found in Bangladesh.³¹¹ The possibility of the unconventional gas is also found as there are significant thin bed gas plays in most of our gas fields which are not extracted for not having right technology and skilled manpower.³¹² In this area there is no expertise, knowledge and the idea is very poor. In this regard a good example is Canada where traditional reserve has been finished almost 30 years ago, but using modern technology they extract from unconventional reserves. It is also opined that that for future planning the country's available reserve should be known first.³¹³ Utilisation should be planned with known reserve as unknown reserve is uncertain.³¹⁴ The exploration of natural gas has not been completed³¹⁵ in offshore and deep-sea while no deep drilling has been fully undertaken in onshore areas.³¹⁶ As a large area including onshore and offshore blocks remains unexplored then any suggestion about the depletion is premature, as known reserve may be finished but there may remain more 'yet to find' natural gas underground. Serious exploration should be ensured first while Bangladesh went for minimum exploration for decades.³¹⁷ If the probability of new resources is found then it has to be planned in one way and if not, then in another way.³¹⁸ To this end the natural gas should be extracted in proportion with the need for industrial

³¹¹Interview with GO1.

³¹²Interview with EP4.

³¹³Interview with GO1.

³¹⁴Interview with GO3.

³¹⁵Interview with GO1, GO2, GO3, EP1, EP4 and ENV1.

³¹⁶Interview with GO2.

³¹⁷Interview with EP4.

³¹⁸Interview with GO1.

growth through a company under national ownership and for long term benefit, gas should not be exported.³¹⁹ Recommendation is also made for massive exploration by both the national and international oil companies and to attract the IOCs some terms and conditions have to be made flexible. Simultaneously some rigidity also has to be upheld to protect the interest of the country.³²⁰ Using latest technology to search new sources is one of the solutions to meet the need of the present and future generations.³²¹ Other solution is to find out alternative sources of renewable energy.³²² One respondent also believes that according to some experts, Bangladesh, there is a great chance of finding oil 15,000-20,000 feet below the ground, but at present Bangladesh can explore up to maximum 10 thousand feet below the ground.³²³

There is another opinion that, the reserve of natural gas in Bangladesh is very small compared to that of other countries and increasing demand. These should be extracted sustainably with due diligence and be compatible with international standards. Exploration of offshore blocks should be prioritised.³²⁴ All the countries of the Southeast Asia are in energy deficiency and depend on imported energy. Their national strategy considered the scenario of running out of natural gas, still some of the countries like India, Thailand and Malaysia heavily invested to develop the petroleum sector. As a result, their companies will continue operating in international areas even after their indigenous resources run out and this approach should be adopted by Bangladesh.³²⁵ Therefore as it is a depleting resource, it should be managed properly and its uses should be conscious and controlled.³²⁶ It is also highlighted that sustainability with fossil fuels refers to efficiency and conservation and one respondent has added that

“Sustainable means you keep something for your next generation. From that perspective if you want to keep some of the resources for your next generations or as much as possible but we know that we have limited resources eventually all will dry up and there will not be any more fossil fuel. So the only way is efficiency and conservation.”³²⁷

Three respondents have directly opined in line with the above expression while ten respondents have emphasised conservation in a number of ways.

³¹⁹Interview with EP5.

³²⁰Interview with GO2.

³²¹Interview with PE1.

³²²Interview with PE1 and ENV1.

³²³Interview with ENV1.

³²⁴Interview with AC1.

³²⁵Interview with AC3.

³²⁶Interview with AC5.

³²⁷Interview with EP1.

So it is recognised that to ensure the sustainable development of natural gas in Bangladesh, conservation for future generation is significant. The ways suggested to this end are efficient use, prohibition of export, extraction through national oil company, attracting the IOCs to explore and technology development. All the respondents agree that firstly a massive exploration should be done to find out how much gas Bangladesh has before any planning of conservation. In this case one of the crucial issues is the rate of extraction of gas. If the gas is produced at a higher rate it is bound to be finished quickly. On the contrary, if it is properly produced according to international norms, then it will sustain for a long time and ultimately the future generation will be benefitted. Export of natural gas should be prohibited and to this end the respondents suggest to enact the prohibition of energy and mineral resources Act.

Therefore when extraction is started from a field, it is not possible to conserve for future generation in the same field. In this case the optimum recovery has to be ensured to minimise pressure on unproduced fields. The researcher also made a query in this regard and it is shown that theoretically one cannot extract more than 7.5% of the proven reserve yearly. If it is done then it may jeopardize the reservoir.³²⁸ The MPSCs of Bangladesh have allowed the IOCs to produce more than 7.5% and it is in practice in Bibyana gas field.³²⁹ The permission to produce more than 7.5% of the proven reserve gas ultimately harms the reservoir.³³⁰ It is also opined that

“There is not enough investment to acquire sufficient knowledge on a field. It seems to me that whenever a gas field is discovered, the emphasis is to quickly hook up with the production network, without properly studying the field.”³³¹

The production rate is higher than the defined rate and concern is expressed that it will be depleted quicker than the expected time.³³² Actually the recovery rate depends on various properties of a particular gas field. Though some of the modern technologies such as fracking are not used, traditionally maximum of proven reserve are recovered in Bangladesh and it is satisfactory.³³³ It has also been opined that the ultimate recovery percentage of gas fields in Bangladesh is more than 80%, which is highly satisfactory, and Petrobangla always tries to keep the production within 7.5% of the proven gas reserve yearly as the produced gas has to be purchased by Petrobangla. Sometimes to meet the national demand, production rate

³²⁸Interview with EP1 and EP2.

³²⁹Interview with EP2.

³³⁰Interview with AC2.

³³¹Interview with AC3.

³³²Interview with EP3.

³³³Interview with GO1.

is increased and that is up to yearly 8 to 8.5% but not more than that. Though the IOCs don't think that the yearly production of more than 7.5% of the reserve may hamper the gas field, Petrobangla maintains this limit so that no harm is caused to the gas field.³³⁴

On the contrary it is also opined that

“The recovery rate of gas from national fields are relatively lower than those of IOCs (i.e. 20 to 30 mmcf/d per well in national wells against 30 to 70 mmcf/d per well of IOCs).”³³⁵

The reasons behind such kind of low rate of production in the fields operated by the national oil company are the smaller tubing diameter and other mechanical adjustments.³³⁶ However, installation of modern equipment (compressor) and utilisation of modern technology (hydraulic fracturing) can increase the recovery percentage.³³⁷ It is alleged that suggestions are also made from the consultant group and individuals to make the required set up to increase the recovery rate but these are not followed upon yet.³³⁸

To ensure energy security for future generation it is essential to follow the good reservoir practice with modern technology to ensure the ultimate recovery, not leaving any recoverable gas behind in the field. From the opinions of the experts it is disclosed that the rate of recovery is not bad, but it can be increased through using modern technology and the decision makers should pay proper attention to this issue. The necessity of legal obligation to meet the demand of future generations is also expressed by the respondents. Though some of the respondents have suggested to introduce the fracking system to ensure the optimal recovery, its environmental impact also has to be taken into consideration through cost benefit analysis that how much gas will be produced in a year and to what extent the environment will be affected. To ensure the energy security for future generation the Government should enact the energy conservation Act along with the provision of prohibiting export.

5.9 CONCLUSION

The natural gas extraction is not possible without any environmental cost. The host country is under an obligation to enact laws under the guidance of international law. Most of the developing countries have enacted some laws and regulations addressing the environment, but their effective implementation mechanism is insufficient.³³⁹ However, the awareness is

³³⁴Interview with GO2.

³³⁵Interview with EP4.

³³⁶Interview with EP4.

³³⁷Interview with AC4.

³³⁸Interview with EP4.

³³⁹Weaver, “Sustainable Development in the Petroleum Sector,” 25.

growing among the developing nations and the oil-producing countries are under pressure to adopt the mechanisms, and the cancellation or suspension of license, fines, criminal penalties, introduction of environmental tax etc., are applied in the developed nations to protect the environment from the petroleum operation.³⁴⁰ In Bangladesh, transparent rules and regulations and their effective compliance mechanism should be strengthened to ensure compliance of the operating companies. The rules, regulations or MPSCs should clearly define the technical, structural and procedural requirements to address the environmental aspects of natural gas extraction in Bangladesh. It will help the Government to assure the proper monitoring of the compliance by the operating company. The operating company's compliance with the environmental standards specified by the national legislation ultimately depends on the role and capacity of the regulatory authority during the negotiation. Both the host Government and the operating company have to adopt an environment-friendly approach and use modern technology to minimise the environment pollution to ensure sustainable natural gas operation. It can be achieved by a joint collaboration of the Government and the operating company based on respect, setting objectives on consensus, and specifying the role and responsibilities of both parties. To this end, both parties should adopt cost-effective measures and precautionary measures to minimise the degradation of the environment.

Another matter of consideration is that, when the operating company goes to obtain the ECC, then it has to submit documents like EIA, EMP report, ToR etc. It indicates that the assessment will be conducted by the operating company. Therefore the assessment may not be adequate, as in their code of conduct there may be a possibility that MNCs incorporate only those provisions which they can apply with a wide range of discretion.³⁴¹ In such cases, evaluation by the third party should be introduced to enhance the public confidence in the operation. It requires the effective environmental audit by a third party, but as an audit by an international firm requires a large amount of money, internal audit should be encouraged.

Finally, the Government should formulate a comprehensive petroleum development policy including environmental consideration in its central point along with its economic objectives, integrating environmental laws and management system. Priority should be given on setting of environmental goals or standards that are to be met by the operating company. It will oblige the operating company to define the plan and strategies to achieve the goal defined by the regulator.

³⁴⁰Weaver, "Sustainable Development in the Petroleum Sector," 19.

³⁴¹Ibid., 25.

CHAPTER SIX

CONCLUSION AND SUGGESTION

The aim of this chapter is to make concluding remarks of this study and to suggest recommendations for policy and legal reform based on the study. Recommendations are also made to further study in this research area.

6.1 SUMMARY

Continuous economic growth and urbanisation has increased the demand of energy in Bangladesh. As a consequence demand for natural gas, the principal energy source, has increased manifold. The agriculture sector is also equally dependent on the supply of natural gas since the production of fertiliser is dependent on natural gas. Bangladesh is exploring, producing and marketing natural gas for some decades. The unique role of natural gas in the economy and energy sector and the dependence upon products derived from it has created a need for good management of this limited resource. It is believed that natural gas produces fewer pollutants when it is burnt, though environmental problems are inevitable in the exploration and production phases of this valuable resource. These facts make it necessary to consider how Bangladesh should regulate the upstream operation of natural gas to maximise its value so that the country benefits from the sustainable development of this non-renewable resource. The challenge of regulation starts from the allocation of petroleum license when the State can demand that the whole petroleum operation is to be operated in the light of sustainable development principles and negotiate with the interested companies. Challenges during exploration and production of petroleum resource are equally important and require sound regulatory and institutional frameworks. The operation of natural gas has some impact on the environment as contamination of groundwater and surface water, soil contamination and erosion, air pollution, emissions of greenhouse gas, the impact of seismic survey, impacts on wildlife habitat and biodiversity, eradication of vegetation sediment and dust pollution, discharge of wastage etc.³⁴² Therefore, if the resources are extracted too quickly there is a possibility of damaging the reservoir or depleting the resource too quickly. These challenges

³⁴² Glen Greer, Michelle Marquet and Caroline Saunders, "Petroleum Exploration and Extraction Study," Agribusiness and Economic Research Unit, A Lincoln University Research Centre, New Zealand, (March, 2013), 54.
<http://www.gdc.govt.nz/assets/Files/Reports/EnvirolinkpetroleumimpactsstudyFINAL24Jan13.pdf> accessed on July 8, 2020.

can be managed if the State establishes and sustains a legal regulatory framework that encourages the sustainable development of the resource.

Policies, laws, rules and model production sharing contracts are framed to foster exploration and production of natural gas in Bangladesh. It is clear that there are challenges and opportunities for Bangladesh for the development of policy and legal frameworks for natural gas extraction that offers sustainability. The research has utilised the United Nations' three pillar approach as the core principle and also utilised the principles of the New Delhi Declaration and others. Recent literatures make it evident that there should be a fourth pillar, good governance, to support the three pillar approach of the United Nations. Therefore, the research considers sustainability as a concept that bases itself on four main components – social, environmental, economic condition and good governance.

Based on the aforementioned principles and research papers pertaining to sustainable development concepts in petroleum operation six indices are selected to verify the status of sustainable development. Based on these selected indices existing policies, laws, rules, model and actual production sharing contracts, reports of different organizations are critically examined. Relevant research reports are reviewed to examine how far the concept of sustainable development is incorporated in the upstream natural gas operation in Bangladesh. The study emphasises sustainable environmental development aspect of natural gas to optimise the extraction in a safe manner. The analysis is focused on the regulatory challenges confronting the sustainable exploration and production of natural gas in Bangladesh. Semi-structured key informant interviews with government officials and experts from relevant fields are also conducted to justify the findings from the relevant primary and secondary sources of this research as well as to derive conclusions and recommendations. It is noticeable that the findings from document analysis are in good agreement with the opinion of the respondents. This chapter, therefore, presents the conclusion and suggestions based on the key findings of the study.

6.2 CONCLUSIONS

Critical study of the policy, legal and regulatory frameworks pertaining to the development of natural gas, this study finds that though the policy objectives have incorporated the concept of sustainable development, that is not reflected in existing legislation governing the upstream operation of natural gas in Bangladesh. The research also reveals that the existing legal and institutional frameworks are not fully implemented in the spirit of sustainable development. Absence of legislation in certain areas to protect the environment and interests

of the society and lax implementation of existing legislation are found to be the major problems in this very sector.

6.2.1. Petroleum Policy

Petroleum policy plays a crucial role in the development of petroleum resources. A sound petroleum policy includes several aspects such as the rate of depletion of resources, awarding and administrating licenses for exploration and production, designing legislative and regulatory frameworks, designing the institutional framework, operating a national oil company, and integrating international obligations.³⁴³ Absence of a sound petroleum policy encourages resource development on ad hoc basis in an uncontrolled manner which eventually does not benefit the State. Analysis of the Petroleum Policy of 1993 demonstrates that the policy has not been reviewed or re-evaluated since its first adoption in 1993. The policy suggested to amend the existing laws to implement the objectives of this policy but till now no initiative is found to amend the Petroleum Act 1974 which is the main Act to govern the upstream operation of natural gas in Bangladesh. Amendment of confidentiality clause also has not taken place according to policy guidelines till now. There is a provision that the confidentiality of the contract will remain even for a period of five years after the termination of the contract in the latest updated MPSC of 2019. Database is not maintained to ensure the information flow as was suggested by the policy.

Bangladesh has adopted the National Energy Policy in 2004 with several objectives including providing energy for sustainable economic growth and ensuring optimum development of all the indigenous energy sources. This policy suggested to consider the environmental concern at every phase of petroleum operation and conservation for future generation was encouraged proposing to enact the Energy Conservation Act. That the environment management system and process to conduct the EIA are not satisfactory is revealed from the experts' opinion. Moreover, the detailed rule for EIA is yet to be enacted.

A petroleum policy is also integrated with NEP of 2004 to secure the principal source of energy, natural gas. This petroleum policy is actually the shadow of the previously adopted one. One of the objectives of this Petroleum Policy is to attract investment for exploration and production. Use of natural gas is promoted through this policy to reduce import of petroleum. This petroleum policy also encourages exploration and rational use of petroleum

³⁴³ Alexander Huurdeman and Anastasiya Rozhkova (eds), *Balancing Petroleum Policy Toward Value, Sustainability and Security* (Washington, DC: World Bank Group, 2019) <https://openknowledge.worldbank.org/bitstream/handle/10986/31594/9781464813849.pdf> accessed on 11 July 2020.

resources for sustainable development of the country. It is also proposed here to enact three rules out of which one is the Oil and Gas Exploration Safety Rule. Lack of intention to implement or follow the policy guidelines is found in the analysis. Despite several blowouts in the gas fields, the policy guideline in this regard and the Oil and Gas Exploration Safety Rules are yet to be framed. Strengthening of research and development capabilities of Petrobangla and other related institutions utilising the Government share of PSC is also less prioritised. This apathetic attitude towards the policy objectives has hindered the development of national experts in this highly attractive sector.

Bangladesh has successfully developed a portion of its onshore reserves through national and international oil companies. Shortage in gas supply indicates that exploration, development, and production growth is not able to keep pace with the demand. The policy also emphasises exploration of the virgin areas. However it is not reflected in implementation. Petroleum policy does not explicitly guide the implementation of environmental obligations though it guides towards promoting environmental impact assessment.

6.2.2. Legislative Framework

Most of the laws and regulations governing the upstream natural gas operations came into operation long before the emergence of sustainable development concept. Analysis of the legislative frameworks demonstrates that the legal regulatory framework regarding the E & P of natural gas is in fragmented form. There is an absence of a complete legal framework. There is no clear objective regarding the production of petroleum resource in the Petroleum Act. Provisions of the Petroleum Act are descriptive in nature, but with ambiguity, though rules were supposed to be framed to guide the exploration and production activities.

The enactment of Speedy Supply of Power and Energy Act has added new challenge to sustainable natural gas development as it allows to sign contract with operating company without any tender and the responsible authority is beyond any accountability.

6.2.3. Contractual Framework

Bangladesh is updating the model production sharing contract with a view to attracting oil companies to explore petroleum in onshore and offshore blocks. Analysis of actual contracts reveals that in the actual contract there are some deviations from the MPSC. Modification of certain clause(s) in the actual contract has privileged the company without properly maintaining the interest of the State.

The State has the objective of attracting international investment to sustainably exploit petroleum resources in Bangladesh. Bangladesh follows the bidding system which is

considered to be the ideal. There are controversies regarding transparency in the bidding round. External pressure, bribery etc. have influenced the awarding of licenses.

MPSC provides clause for conservation, safety of life, protection of environment, prevention of pollution and safety and health of personnel using the phrase “generally accepted standards of the International Petroleum Industry”. Incorporation of such phrases creates ambiguity as the term is not properly defined.

MPSCs are lenient on the issue of gas flaring as these do not impose any requirement for re-injecting the gas into the ground if it is not taken by the state-owned enterprise. Gas flaring not only causes a waste of resources but also harms the environment. Liability for environmental damage is a growing issue for sustainable development of petroleum resources. Bangladesh has experienced several blowouts resulting in severe damage to the environment. MPSC incorporates several sectors, including equipment or property damage, cleanup debris etc., for accidental insurance coverage. Environmental damage is yet to be covered by insurance. Analysis of the environmental regulations reveals that there are deficiencies in monitoring and enforcement. Thus, contractual clauses should include improvements in these areas. It is also evident from the case studies that there are weaknesses both in the legislation and in the regulatory organisation to claim compensation from the operating oil companies for blowouts occurred due to their negligence. There are also barriers set in the environmental legislation so that the affected local community cannot file suit against the operating company without prior approval of the concerned officer of DoE.

There is a recommendable provision in the MPSC to conserve the natural resource as the MPSC requiring that the contractor pays for the natural resources, such as water, that it utilises. Pay per use usually restricts the unnecessary use of the resource or discourage wastes.

6.2.4. Institutional Capacity

Petrobangla performs regulatory activities on behalf of the Government. The organisation plays an administrative role in the exploration and production activities as well as in the downstream operations. Petrobangla also performs commercial activities through its subsidiaries.

Head of this department is appointed from other department, which may hinder the implementations of the strategic initiatives with long term vision. It is evident from the analysis that change in political power or political environment as well as bureaucratic interference influences the strategic implementation criteria of mission and vision of this organisation.

BAPEX is the only national oil company of Bangladesh dedicated to both exploration and production of natural gas activities with the vision of establishing itself as the leading National Oil Company through activities in the field of hydrocarbon operation and contributing towards sustainable economic growth of Bangladesh. One of the good points in the extractive activities of Bangladesh is that BAPEX receives strong support from the Government and there are provisions in the policy as well as in the MPSC for getting business priority. For this BAPEX has been able to discover several onshore gas fields. On the other hand, too much dependence on the government fund, lack of modern equipment, being slow in technology induction, high maintenance cost of old equipment, hindrance in the implementation of strategic initiatives have slowed down the expected outcomes from BAPEX.

Poor performance of BAPEX and Petrobangla is also evident from the speech of the State Minister of Power, Energy and Mineral Resources, “BAPEX had a history of success, but it has been failing for the last few years. This can’t continue and the same applies to Petrobangla”.³⁴⁴

6.2.5 Protection of Environment

It is evident from the research that environmental protection has not been given due importance and in fact it is the most undervalued aspect in the E&P of natural gas. There are many gaps such as processes for assessing, determining, or assigning the future liability costs of development, operation, decommissioning and abandonment of oil fields in the policies and legislation, and that is why the environmental management is less effective. Interviews with experts also have brought some other sides for the mishap in environmental management in the exploration and production of natural gas to light. Economic development is prioritised over environmental cost. Though completely environment-friendly natural gas operation is not possible as some of its negative impact is acknowledged worldwide, no specific environmental guideline according to which the upstream operation of Bangladesh can take place is provided in either the petroleum laws or the MPSC. The impact on environment due to the natural gas operation is comparatively low than that from other fossil fuel operations, but leakage that often takes place during the operation and blowouts that may happen during the operation create a massive environmental harm, which is not addressed in

³⁴⁴ Md. Saidun Nabi, “Petrobangla, Bapex Slammed Heavily for ‘Below Par Performance,’” *The Dhaka Tribune*, December 15, 2019. <https://www.dhakatribune.com/bangladesh/dhaka/2019/12/15/petrobangla-bapex-slammed-heavily-for-below-par-performance> accessed on 15 March 2020.

the petroleum-related laws of Bangladesh. Removal of wreck and debris and cleaning up of pollutants resulted from the accident is covered by the insurance but a huge amount of environmental damage resulting from blowout is not covered by the insurance provision of the MPSC of Bangladesh. The general environmental laws are followed in environmental management of the natural gas operation. However, there is a number of lackings in the institutional capabilities of the responsible department according to the experts' opinion. It hinders the proper coordination among the relevant departments. Without any specific guidelines, only the good international practice is not enough to ensure the compliance of the operating company with the environmental obligations.

6.2.6 Access to Information and Transparency

Right to information is realised and is ensured by the Right to Information Act 2009 to establish the transparency and accountability of any organisation constituted or run by the Government or foreign financing.³⁴⁵ Free flow of information increases good governance and decreases corruption. Employees and representatives of Petrobangla have full and complete access to all records and data kept by the contractor and the operator. The present regulatory framework in Bangladesh encourages the reporting of production data, and the daily natural gas production data is shared through the website of Petrobangla. The confidentiality clause of MPSC restricts public access to data and information regarding contract provision. Such provision is in contradiction with the objectives of the Right to Information Act. Hindrance in accessing data is an obstacle for establishing good governance and achieving sustainable development goals. There is no provision in the MPSC as to the audit of account of IOCs by government audit department. It puts the transparency of Petrobangla in question as Petrobangla approves the budget and audits the accounts of the IOCs .

6.2.7 Rate of Recovery

There is a necessity of determining the rate of depletion of the petroleum resources to ensure the conservation for generations and to establish the State's control over the exhaustible resources.³⁴⁶ To regulate the rate of petroleum from fields is also necessary for the regulation of petroleum activities to meet national petroleum policy objectives. There is no standard of optimum rate of recovery for oil or natural gas. The MPSC set the recovery rate at 7.5% of the yearly production of the proven reserve .This provision continued up to 2012, but the revised MPSC replaced the term 'proven reserve' with 'proven and probable reserve'.

³⁴⁵Right to Information Act 2009pmb1.

³⁴⁶Hunter, "Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources A Critical Functional Analysis,"356.

Moreover, a greater percentage than the previously specified rate was fixed on condition that it had to be agreed between the operator and Petrobangla. The probable reserve is highly uncertain and the production based on probable reserve is not consistent with the concept of sustainable development. Analysis reveals that the specified recovery rate is not maintained and often the production rate is higher. This may lead to permanent damage to the reservoir and the optimum recovery from the field may be lower and finally, it may endanger the achievement of sustainable development.

6.2.8 State's Participation

Bangladesh follows the Norwegian 'carried-interest'³⁴⁷ model for participating in the exploration and production activities. State's participation is also ensured in the MPSC. Bangladesh already has experienced joint venture agreements with IOCs. BAPEX was 10% carried interest partner in several joint ventures. State's participation in E&P activities is further ensured by specifying certain blocks only for BAPEX. BAPEX has shown its potential in exploration with a success rate of 40%. Controversy for BAPEX being a carried interest partner in the E&P activities is evident from the expert opinions in the interviews. There is an argument that the State's interest is not properly protected through negotiated. Case studies also provide a clear indication of weak performance of the regulatory body in negotiation.

6.2.9 Community Consultation

Community and stakeholder consultation is very important for sustainable development but there is no legal provision neither in petroleum laws and MPSC nor in the environmental legislation related to petroleum operation. To some extent it is followed but from the opinion of the respondents it is clear that the process is not satisfactory.

6.3 SUGGESTION

There is no simple panacea for avoiding the constraints to achieve the sustainable development in upstream petroleum activities. Considering the importance of natural gas in the future development prospect of Bangladesh and the findings of this study, following recommendations are made:

³⁴⁷Carried interest is a method where the state has option to participate in the E&P activities without taking the risk of failure from the exploration and appraisal well. The state receives the equity interest if there is commercially viable discovery. See also Peter A. Nolan & Mark C. Thurber, "On the State's Choice of Oil Company: Risk Management and the Frontier of the Petroleum Industry," in *Oil and Governance: State-Owned Enterprises and the World Energy Supply* D. Victor, D. Hults, & M. Thurber (Eds.), (Cambridge: Cambridge University Press, 2010), 121-170.

6.3.1 Suggestions for Policy, Legislative and Regulatory Reform

The following suggestions are made for policy, legislative and regulatory reform

1. The policy guidelines should be implemented immediately and the policy should be revised on a regular basis. To achieve policy objectives the law should be amended and institutional capability has to be increased.

2. Considering the sustainability in the upstream operation of natural gas comprehensive petroleum law should be enacted or existing law should be amended. It should comprise all the provisions including rights and obligation of the operating company and the regulatory body as well as of the Government. Besides the environmental terms and condition that are to be complied by the operating company during the operation along with the environmental and social impact assessment through the proper community consultation process should be included here. Adequate monitoring system should be included to evaluate whether the environmental terms and conditions are properly followed or not.

3. To ensure the transparency in the contract making process through open tender and proper analysis, there is a necessity to stop the operation of Speedy Supply of Power and Energy Act 2010 as such an Act is not compatible with the concept of sustainable development.

4. Access to information relating to natural gas exploration and production has to be ensured. To this end, the confidentiality clause of the MPSC has to be abolished and the provision to disclose the full-text contract after completion of signature is to be incorporated. The Right to Information Act of 2009 should include the provision of non-disclosure of the information related to commercial and business confidence. To what extent the confidence will remain and in which dealings it will be applicable should be clearer. Bangladesh should join the Extractive Industries Transparency Initiative (EITI) to show its commitments to disclose information on how the exploration and production contracts are awarded for the benefit of the public.

5. Provision should be incorporated in the MPSC to ensure proper audit of every financial dealings of IOCs that is subject to cost recovery by the government audit department of Bangladesh.

6. Provision of insurance coverage for environmental harm that may result from accidents during the natural gas operation should be included in the MPSC. That will facilitate the realisation of the compensation of environmental damage from an accident.

It will ensure that the operating company cannot escape from their liability, as happened in the Magurchara and Tengratilla incidents.

7. There is a need for regulatory reform for the sustainable development of petroleum resources. In this regard, Bangladesh may follow the Norwegian 'separation of functions models'. Therefore, the policy making, regulatory functions and commercial activities in the petroleum sector should be formally separated. The policy development task should be vested on the Ministry of Power, Energy and Mineral Resources, the regulatory responsibility to Petrobangla, and the commercial hydrocarbon activities in the hand of BAPEX. In fact, this reform needs only some a few changes regarding the relation between Petrobangla and BAPEX as the Ministry of Power, Energy and Mineral Resources develops the policy. Bangladesh already has accepted and implemented part of the Norwegian model for participating in the E&P activities through its national oil company BAPEX. So it can be assumed that the adoption of the Norwegian model will be more effective.

8. State's ownership in the petroleum sector should be established for ensuring sustainable development. Concept of State's ownership was realised by the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman. It was then established by purchasing 5 gas fields in 1975. The economic condition of Bangladesh was not strong enough to show such courage. This remarkable decision was taken at that time to ensure the then demand for energy and to safeguard the interest of future generation. The Prudence of Bangabandhu laid the foundation of the sustainable energy sector in Bangladesh. Petroleum exploration has high risk in the sense that it requires huge initial investment to an uncertain object. Present economic condition of Bangladesh is much better compared to that of 1975. On the contrary, the present energy demand is much higher than that in 1975. It is the need of hour that the State should invest more in exploring petroleum resources, both in onshore and offshore blocks, through its national oil company BAPEX.

9. The fulfillment of the future generation's need has to be ensured through the enactment of Conservation of Energy Act according to policy guideline and the yearly recovery rate should be kept to a justified level with proper field study. Instead of gas flaring the provision of re-injection should be incorporated through cost-benefit analysis.

6.3.2 Suggestion for Further Study

Sustainable upstream operation of natural gas in Bangladesh covers a wide range of area. But the study focused only on the onshore operations. Offshore petroleum operation is not considered in this study though the discussion of offshore petroleum operation could not be

avoided in some contexts. The analysis was also limited to the upstream operation of natural gas and this study is not focused on downstream phase. Future study may consider these aspects for further analysis of natural gas operation in Bangladesh in the light of sustainable development principles.

Bibliography

Books, Theses, Articles and Reports

- Afrin, Zakia. "Foreign Direct Investments and Sustainable Development in the Least-Developed Countries." *Annual Survey of International & Comparative Law* 10, no.1, (2004). <http://digitalcommons.law.ggu.edu/annlsurvey/vol10/iss1/9> accessed March 19, 2019.
- Ahamad, Mazbahul and Fahian Tanin. "Next Power Generation-Mix for Bangladesh: Outlook and Policy Priorities." *Energy Policy* 60 (2013):272–83.
- Ahmed, Ferdous, Abul Qasem, Al Amin, Md. Hasanuzzaman and Saidur Rahman. "Alternative Energy Resources in Bangladesh and Future Prospect." *Renewable and Sustainable Energy Reviews* 25(2013):698–707.
- Alam, J. B., A. A. M. Ahmed, G. M. Munna and A. A. M. Ahmed. "Environmental Impact Assessment of Oil and Gas Sector: A Case Study of Magurchara Gas Field." *Journal of Soil Science and Environmental Management* 1, no.5 (July, 2010): 86-91.
- Alana Wilson and Miguel Cervantes, *Annual Survey of Mining Companies 2013*, Fraser Institute (2014). <https://www.fraserinstitute.org/sites/default/files/mining-survey-2013.pdf> accessed on May 12, 2020.
- Alba, Eleodoro Mayorga. "Environmental Governance in Oil-Producing Developing Countries." *Extractive Industries for Development Series #17*, World Bank Oil, Gas, and Mining Policy Division Working Paper (2010).
- Alexandra Clemett, *A Review of Environmental Policy and Legislation in Bangladesh*, (Department for International Development, 2006). <https://www.gov.uk/dfid-research-outputs/a-review-of-environmental-policy-and-legislation-in-bangladesh> accessed August 18, 2017.
- Ali, Norfadhilah M. "Sustainability of Petroleum and Environmental Control in the Malaysian Petroleum Law." Malaysia (2009). <http://ddms.usim.edu.my/> accessed on May 17, 2019.
- Aminuzzaman, Salahuddin M. "Environment Policy of Bangladesh: A Case Study of an Ambitious Policy with Implementation Snag." South Asia Climate Change Forum, Monash University, Australia, (July 2010).
- Anifowose, B., D.M. Lawler, D. van der Horst, and L. Chapman, "A systematic Quality Assessment of Environmental Impact Statements in the Oil and Gas Industry." *Science of the Total Environment* 572 (2016): 570–85.
- Anis, Mohamad Danish and Tauseef Zia Siddiqui. "Issues Impacting Sustainability in the Oil and Gas Industry." *Journal of Management and Sustainability* 5, no. 4(2015):115-24.
- Anis, Mohamad Danish and Tauseef Zia Siddiqui. "Issues Impacting Sustainability in the Oil and Gas Industry." *Journal of Management and Sustainability* 5, no. 4 (2015): 115-23.

- Annual Report 2015* (Dhaka: Petrobangla, 2015): 7. https://petrobangla.org.bd/admin/attachment/webtable/79_upload_0.pdf, accessed June 19, 2017
- Antoniou, Grigori, Guido Governatori and Michael J. Maher. "Representation Results for Defeasible Logic." *ACM Transactions on Computational Logic* 2(2001): 255–86.
- Asian Development Bank. "Bangladesh Energy Study-Executive Summary." Asian Development Bank, Manila, 1975. <https://www.adb.org/countries/bangladesh/main>, accessed July 19, 2017.
- Azad, A.K., M.G. Rasul, M. Mofijur, M.M.K. Bhuiya1, Sukanta Kumar Mondal and M. Kafilur Sattar. "Energy and Waste Management for Petroleum Refining Effluents: A Case Study in Bangladesh." *International Journal of Automotive and Mechanical Engineering* 11(2015): 2170-87.
- Azapagic, Adisa. "Developing a Framework for Sustainable Development Indicators for the Mining and Minerals Industry." *Journal of Cleaner Production* 12 no.6 (2004): 639-62.
- Bakht, Delawar. "Environmental Impact Assessment of Natural Gas Development in Bangladesh." Master of Engineering Thesis, Bangladesh University of Engineering and Technology, 1998. <http://lib.buet.ac.bd:8080/xmlui/handle/123456789/552> accessed May 4, 2017.
- Banerjee, Alipak, M S Ananth and Vivek Kathpalia, *Oil and Gas Industry in India Legal, Regulatory & Tax*, Nishith Desai Associates (July 2018), 11. https://www.nishithdesai.com/fileadmin/user_upload/pdfs/Research%20Papers/Oil_and_Gas_Industry_in_India.pdf accessed on October 21, 2019.
- Banister, Peter, Erika Burman, Ian Parker, Maye Taylor and Caroll Tindal. *Qualitative Methods in Psychology: A Research Guide*. Open University Press, 1997.
- Barnard, Michelle. "The Role of International Sustainable Development Law Principles in Enabling Effective Renewable Energy Policy – A South African Perspective." *Potchefstroom Electronic Law Journal* 15 no. 2: 207-43. <http://www.saflii.org/za/journals/PER/2012/21.pdf> accessed on March 10, 2018.
- Barral, Virginie. "Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm." *The European Journal of International Law* 23 no. 2 (2012): 377-400.
- Bastida, Elizabeth. Managing Sustainable Development in Competitive Legal Frameworks for Mining: Argentina, Chile and Peru Experiences. <http://www.dundee.ac.uk/cepmlp/gateway/index.php?news=28258> accessed on December 3, 2018.
- Bhuiyan, Mizanur Rahman. "Wetland Management in Bangladesh." *Nature Study Society of Bangladesh* (2013). available at <http://www.naturestudysociety.org/wetland-management-in-bangladesh/> accessed on January 14, 2020.

- Bishoge, Obadia Kyetuza, Lingling Zhang, Witness G. Mushi, Shaldon L. Suntu. "The Overview of the Legal and Institutional Framework for Oil and Natural Gas Sector in Tanzania: A Review." *Journal of Applied and Advanced Research* 3(2018): 8-17.
- Bishoge, Obadia Kyetuza. "The Overview of the Legal and Institutional Framework for Oil and Natural Gas Sector in Tanzania: A Review." *Journal of Applied and Advanced Research* 3(2018): 8-17, available at <http://dx.doi.org/10.21839/jaar.2018.v3i1.127> accessed on June 24, 2019
- Black, Julia, Martyn Hopper and Christa Band. "Making a success of Principles-based regulation." *Law and Financial Markets Review* (May, 2007): 191 -206.
- Blllah, AHM Mustain and Md. Abdul Aziz Khan. "Gas Extraction and Its Implication for Economic Sustainability of Bangladesh." *The Bangladesh Development Studies* 27 no.3 (2001):1-34.
- Boote, David and Penny Beile. "Scholars before Researchers: On the Centrality of the Dissertation Literature Review in Research Preparation." *Educational Researcher* 34 no. 6 (Aug-Sep. 2005):3-15. <https://www.jstor.org/stable/3699805> (accessed August 18, 2017).
- Bosselmann, Klauss. *The Principle of Sustainability: Transforming Law and Governance*. Taylor & Francis, 2016.
- Bouslah, Kais, Bouchra M'Zali, Maher Kooli and M. Turcotte. "Social and Environmental Responsibility, Certifications and Financial Performance." *Gestion* 31, no.2 (2006): 125-33.
- Boyle, Alan E and David Freestone. *International Law and Sustainable Development: Past Achievements and Future Challenges*. Oxford: Oxford University Press, 2012.
- Brine, Patricia and Alan Boyle. *International Law and Environment*, 2nd eds. Oxford: Oxford University Press, 2002.
- Brown, Ibama and Eyenghe Tari. "An Evaluation of the Effects of Petroleum Exploration and Production Activities on the Social Environment in Ogoni Land." *Nigeria International Journal of Scientific & Technology Research* 4, no.4 (April 2015): 273-82.
- Burgemeestre, Brigitte, Joris Hulstijn and Yao-Hua Tan. "Rule-based Versus Principle-based Regulatory Compliance." *Legal Knowledge and Information System* 205. DOI 10.3233/978-1-60750-082-7-37.
- Caron, Joanie, Suzanne Durand, Hugo Asselin. "Principles and Criteria of Sustainable Development for the Mineral Exploration Industry." *Journal of Cleaner Production* 119 (2016): 215-22.
- Chasek, Pamela. "The Story of the UNCED Process." In *Negotiating International Regimes: Lessons Learned from the United Nations Conference on Environment and Development* edited by Bertram Irwin Spector and Gunnar Sjostedt and I. William Zartman. Graham and Trotman, 1994.

- Collins, Hugh. "Methods and Aims of Comparative Contract Law." *Oxford Journal of Legal Studies* 11 no. 3 (1991): 396-406.
- Damilola S. Olawuyi and Zibima Tubodenyefa, "Review of the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria," OGEES Institute, Afe Babalola University, Nigeria (2018).
https://www.iucn.org/sites/dev/files/content/documents/2019/review_of_the_environmental_guidelines_and_standards_for_the_petrolium_industry_in_nigeria.pdf
 accessed March 21, 2020.
- Das, Pulak . "Environmental Management in Oil and Gas Upstream Industry in India." *Journal of Industrial Pollution Control* 30, no. 1 (2014): 59-66.
<http://www.icontrolpollution.com/articles/environmental-management-in-oil-and-gas-upstreamindustry-in-india-.php?aid=45300> accessed on January 9, 2020.
- David R. Thomas and Ian D. Hodges, *Doing a Literature Review in Designing and Managing your Research Project* (SAGE, 2010),105
- Deichmann, Jessica L., Andrés Hernández-Serna, J. Amanda Delgado, C. Marconi Campos-Cerqueira, T.Mitchell Aide. "Soundscape Analysis and Acoustic Monitoring Document Impacts of Natural Gas Exploration on Biodiversity in a Tropical Forest." *Ecological Indicators* 74 (2017): 39–48.
- Department of Environment (DoE), "A Guide to Environment Clearance Procedure," Department of Environment, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh (2010).
- Dike, Samuel Chisa. "Decommissioning and Abandonment of Oil and Gas Facilities Legal Regime in Nigeria: Any Lesson From Norway, the UK and Brazilian Legal Frameworks?" *Journal of Private Law* (September 2017).
- Drexhage, John and Deborah Murphy. "Sustainable Development: From Brundtland to Rio 2012." Background Paper Prepared for Consideration by the High Level Panel on Global Sustainability at Its First Meeting, UN Headquarters, New York (September 2010).
- Dubiński, Jozef and Turek M., Wachowicz J. "Hard Coal Mining and the Idea of Sustainable Development" In *Proceedings of International Scientific Conference – School Underground Exploitation Dniepropietrowsk* (2007):27–38
- Dubiński, Józef. "Sustainable Development of Mining Mineral Resources." *Journal of Sustainable Mining*, 12 no. 1 (2013): 1–6.
- E&P Forum/UNEP. *Environmental Management in Oil and Gas Exploration and Production an Overview of Issues and Management Approaches*, Joint E&P Forum/UNEP Technical Publication, 1997.
<https://wedocs.unep.org/bitstream/handle/20.500.11822/8275.pdf> accessed on January 28, 2019.
- Ebbesson, Jonas. *Compatibility of International and National Environmental Law*. Iustus Förlag 1996.

- Ekhtor, Eghosa Osa. "Public Regulation of the Oil and Gas Industry in Nigeria: An Evaluation." *Annual Survey of International & Comparative Law* 21, no. 1 (2016). <http://digitalcommons.law.ggu.edu/annlsurvey/vol21/iss1/6> accessed on April 8, 2020.
- Elhuni, Redha M. and M. Munir Ahmad. Key Performance Indicators for Sustainable Production Evaluation in Oil and Gas Sector." *Procedia Manufacturing* 11, (2017): 718 – 24.
- Elizabeth Bastida *Integrating Sustainability into Legal Frameworks for Mining: Trends in Selected Latin American* International Institute for Environment and Development and World Business Council for Sustainable Development, January 2002. *Countries* <https://pubs.iied.org/pdfs/G00577.pdf> accessed on February 16, 2019.
- Elkington, John. *Cannibals with Forks, the Triple Bottom Line of the 21st Century*. Oxford: Capstone, 1997.
- Emas, Rachel. "The Concept of Sustainable Development: Definition and Defining Principles." *Global Sustainable Development Report* (2015). https://sustainabledevelopment.un.org/content/documents/5839GSDR%202015_SD_concept_definiton_rev.pdf accessed on January 12, 2018.
- EPA, "An Assessment of the Environmental Implications of Oil and Gas Production: A Regional Case Study," Environmental Protection Agency, Working Draft (September, 2008). <https://archive.epa.gov/sectors/web/pdf/oil-gas-report.pdf> accessed December 20, 2018.
- Etelawi, Abdulrazag Mohamed, Keith A. Blatner and Jill McCluskey. "Sustainability and Depletion Accounting: A Case Study of Oil in Libya." *Environment and Natural Resources Research* 7, no. 1(2017).
- Eze, Amaka .G. and Ted .C. Eze. "A Survey of the Legal Framework for the Control of Oil and Gas Pollution from Some Selected Countries." *Journal of Law, Policy and Globalization* 31(2014): 1-9.
- Faga, Hemen Philip and Uguru Uchechukwu. "Oil Exploration, Environmental Degradation and Future Generation in the Niger Delta: Options for Enforcement of Intergenerational Rights and Sustainable Development through Legal and Judicial Activism." *Journal of Environmental Law and Litigation* 34 (September 2019): 185-218.
- Faruque , Abdullah Al. "*Stability in Petroleum Contracts: Rhetoric and Reality (Lessons from the Experiences of Selected Developing Countries and Economies in Transition (1980-2002).*" PhD Dissertation, University of Dundee, Scotland, 2005. [http://discovery.dundee.ac.uk/portal/en/theses/stability-in-petroleum-contracts\(a180d06b-30c1-46e0-b054-346887e8f369\).html](http://discovery.dundee.ac.uk/portal/en/theses/stability-in-petroleum-contracts(a180d06b-30c1-46e0-b054-346887e8f369).html), accessed June 16, 2017.
- Faruque, Abdullah Al. *Environmental Law: Global and Bangladesh Context*. Dhaka: New Warsi Book Corporation, 2017.
- Faruque, Abdullah Al. *Petroleum Contracts: Stability and Risk Management in Developing Countries*. Dhaka: Bangladesh Institute of Law and International Affairs, 2011.

- French, Duncan. *International Law and Policy of Sustainable Development*. Manchester University Press, 2005.
- Gang Lu, Per Jørgensen, Bent Svensson, Arnfried Lemp, Fraser Wyllie, Carsten Møller Nielsen, Ioannis Abatzis, Asaduzzaman, Mirza Habib, Gas Sector Master Plan 2017 *Ramboll* (Dhaka, 2018), 220. https://mpemr.gov.bd/assets/media/pdffiles/Bangladesh_GSMP_Final_Report.pdf accessed on June 29, 2019.
- Gao, Zhiguo. “Environmental Regulation of Oil and Gas in the Twentieth Century and Beyond: An Introduction and Overview.” In *Environmental Regulation of Oil and Gas*, edited by Zhiguo Gao, Chih-Kuo Kao. London: Kluwer Law International Ltd., 1998.
- Ghosh, B.N. *Scientific Method and Social Research*. New Delhi: Sterling Publishers Private Limited, 1982.
- Giorgi, A. “Sketch of a Psychological Phenomenological Method.” In *Phenomenology and Psychological Research* edited by Giorgi, A. Duquesne: University Press, Pittsburg, 1985.
- Glen Greer, Michelle Marquet and Caroline Saunders, Petroleum Exploration and Extraction Study, Agribusiness and Economic Research Unit, A Lincoln University Research Centre, New Zealand, (March, 2013), 54. <http://www.gdc.govt.nz/assets/Files/Reports/EnviroLinkPetroleumImpactsStudyFINAL24Jan13.pdf> accessed on July 8, 2020.
- Global Compact, “The Ten Principles of the UN Global Compact,” United Nations Global Compact, available at <https://www.unglobalcompact.org/what-is-gc/mission/principles> accessed on April 4, 2020.
- Goniadis, Giorgos and Maria Lampridi (eds), *Introduction to Sustainable Development*. International Hellenic University, 2015.
- Gunatilake, Herath and David Roland-Holst. “Energy Policy Options for Sustainable Development in Bangladesh.” *ADB Economics Working Paper Series* (2013) <https://www.adb.org/sites/default/files/publication/31141/ewp-359.pdf>, accessed July 15, 2017.
- Gunter, Bernhard G. “Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions.” *Bangladesh Development Research Working Paper Series* (BDRWPS) PaperNo. 3 (2008). <https://ideas.repec.org/p/bnr/wpaper/3.html> accessed on April 12, 2019.
- Gunter, Bernhard G. “Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions,” *Bangladesh Development Research Working Paper Series* (BDRWPS) no.3 (December 2008): 2.
- Gustavson Associates. “Monitoring and Supervision Procedures for Exploration and Development Activities – Final Report.” Hydrocarbon Unit, Energy and Mineral

- Resources Division, Government of the People's Republic of Bangladesh, May 6, 2011.
- Hallermann, Detlef R. "A Comparative Analysis of Production-Sharing Contracts and Economic Risk Using a Weighted Criteria Decision Analysis Model." In *Proceedings of 69th Annual Society of Petroleum Engineers Technical Conference*, New Orleans, Louisiana. S.P.E. paper #28345(September 1994).
- Haq, Tahmina. "A Violent Threat to Conservation of Wetlands and the Existing Laws of Bangladesh: A Critical Analysis." *Philosophy and Progress: 53-54* (January-June, July-December, 2013): 113-26.
- Haque, Md. Rashidul. "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh," Masters of Engineering Thesis, Bangladesh University of Engineering & Technology, 2000.
- Harris, Jonathan M. "Sustainability and Sustainable Development." *Internet Encyclopaedia of Ecological Economics* (February 2003). <http://www.isecoeco.org/pdf/susdev.pdf> accessed May 19, 2018.
- Hartwick, J.M. "Intergenerational Equity and the Investing of Rents from Exhaustible Resources." *American Economic Review* 67, no.5(1977): 972-74.
- Henn, Matt, Mark Weinstein and Nick Foard. *A Critical Introduction to Social Research*. SAGE, 2006.
- Hicks, Stephen C. "The Jurisprudence of Comparative Legal Systems." *Loyola of Los Angeles International and Comparative Law Review* 6 (1983): 83-102. <http://digitalcommons.lmu.edu/ilr/vol6/iss1/4> accessed on August 10, 2017.
- Hodas, David. *International Law and Sustainable Energy: A Portrait of Failure, Environmental Law and Sustainability after Rio*. Edward Elgar Publishing, 2011. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1648906 accessed on April 17, 2019
- Holden, Erling, Kristin Linnerud and David Banister. "Sustainable Development: Our Common Future Revisited." *Global Environmental Change* 26 (May 2014): 130-39
- Hoque, M.M.M., Moni Mohan Mandal, M.S. Islam and A.K. Azad. "Development of Environmental Management Plan (EMP) for Oil and Gas Exploration along the Coastal Areas of Bangladesh." *Journal of Innovative Development Strategy* 5 no.1 (2011):50-60.
- Hossain, Kamal. *Law and Policy in Petroleum Development*. New York: Nichols Publishing Company, 1979.
- Hossain, Jakir. "Bangladesh Gas Sector Development: Status, Policy Options and Challenges." *Centre for Policy Dialogue* no. 24, (May 2000): 150.
- Hunter, Tina. "It's time: Petroleum Policy Change for Sustainable Development in the Australian Offshore Upstream." *Journal of Applied Law and Policy* (January 2009): 31-54.

- Hunter, Tina. "Law and Policy Frameworks for Local Content in the Development of Petroleum Resources: Norwegian and Australian Perspectives on Cross-Sectoral Linkages and Economic Diversification." *Mineral Economics*, 27, no. 2 (2014): 115-26.
- Hunter, Tina. "Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources A Critical Functional Analysis." PhD diss., University of Bergen, 2010.
- Hunter, Tina. "Sustainable Socio-economic Extraction of Australian Offshore Petroleum Resources through Legal Regulation: Is It Possible?" *Journal of Energy & Natural Resources Law* 29 (2011): 209- 27.
- Huurdeeman, Alexander and Anastasiya Rozhkova (eds). *Balancing Petroleum Policy Toward Value, Sustainability and Security*. Washington, DC: World Bank Group, 2019 <https://openknowledge.worldbank.org/bitstream/handle/10986/31594/9781464813849.pdf> accessed 11 July 2020
- Imam, Badrul. *Energy Resources of Bangladesh: Natural Gas, Oil, Coal*. Dhaka: University Grant Commission of Bangladesh, 2005.
- Ingelson, Allan and Chilenye Nwapi. "Environmental Impact Assessment Process for Oil, Gas and Mining Projects in Nigeria: A Critical Analysis." *Law, Environment and Development Journal* 10, no. 1(2014): 35 <http://www.lead-journal.org/content/14035.pdf> accessed on March 21, 2020.
- Islam, M. Sirajul and Khaled Mahmud Raihan. "Natural Gas Management: A Bangladesh Perspective." https://ndc.gov.bd/lib_mgmt/webroot/earticle/886/Natural_Gas_Management_A_Bangladesh_Perspective.pdf (accessed January 10, 2017)
- Islam, Muhammad Azizul and Muhammad Aminul Islam. "Environmental Incidents in A Developing Country and Corporate Environmental Disclosures: A Study of A Multinational Gas Company." *Society and Business Review* 6, no.3 (2011): 229-48.
- Ite, Aniefiok E., Udo J. Ibok, Margaret U. Ite, and Sunday W. Petters. "Petroleum Exploration and Production: Past and Present Environmental Issues in the Nigeria's Niger Delta." *American Journal of Environmental Protection* 1(4) 2013: 78-90. doi: 10.12691/env-1-4-2.
- Ite, Aniefiok E., Udo John Ibok, Margaret Ite and Sunday W Peters. "Petroleum Exploration and Production: Past and Present Environmental Issues in the Nigeria's Niger Delta." *American Journal of Environmental Protection*, 1, no. 4 (2013): 78-90.
- James A Baker III Institute for Public Policy, "The Changing Role of National Oil Companies in International Energy Markets," *Baker Institute Policy Report*, no. 35 (2007), 17; <http://www.bakerinstitute.org/research/baker-institute-policy-report-35-the-changing-role-of-national-oil-companies-in-international-energy> accessed on December 15, 2019

- Jodoin, Sebastien A. *The Principle of Integration and the Interrelationship in Relation to Human Rights and Social, Economic and Environmental Objectives* Centre for International Sustainable Development Law. Oxford, 2005.
- John J. Beardsworth and Mathew.A., “Stuart Petroleum Legislative Frameworks and Contracts in a Federation: Issues for Constitutions, Petroleum Laws, Regulations, and Contracts,” 2019, https://elibrary.worldbank.org/doi/abs/10.1596/978-1-4648-1384-9_ch3 accessed on July 24, 2020.
- Karl, Terry L. “Oil-Led Development: Social, Political, and Economic Consequences.” *CDDRL Working Papers*, Center on Democracy, Development, and the Rule of Law, no. 80 (January 2007).
- Kaundu, Ainna Vilengi. “*Analysis of The Legal Framework for State Participation in The Petroleum Industry: A Case of Namibia.*” LLM Thesis, University of Pretoria, 2013.
- Khan, Md. Ashraful Islam and Fuad Bin Nasir. “A Review over Major Gas Blowouts in Bangladesh, their Effects and the Measures to Prevent them in Future.” *International Journal of Scientific & Technology Research* 3, no. 9 (2014):109-13.
- Kirk, Jerome and Marc L. Miller. *Reliability and Validity in Qualitative Research*. SAGE, 1986.
- Koolwal, Manju. “Collection and Analysis of Data in Legal Research.” *Journal of the Legal Studies* 38 (2008): 290-99.
- Lafferty, W.M. (Ed.). *Governance for Sustainable Development. The Challenge of Adapting Form to Function*. Cheltenham: Edward Elgar, 2004.
- Li, Jia, Yun Peng, Ming Zhu, Kai Wang and Jiexin Yi. “Decommission in Petroleum Industry: Current Status, Future Trends and Policy Advices.” *IOP Conference Series.: Earth and Environmental Science* 237 no. 4 (2019): 1-6.
- Mailula, Douglas Tlogane. “*Protection of Petroleum Resources in Africa: A Comparative Analysis of Oil and Gas Laws of Selected African States.*” Phd Thesis, University of South Africa, 2013.
- Mansour, Mario and Carole Nakhle. *Fiscal Stabilization in Oil and Gas Contracts: Evidence and Implications*. Oxford Institute for Energy Studies, 2016. <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/02/Fiscal-Stabilization-in-Oil-and-Gas-Contracts-SP-37.pdf>, accessed July 22, 2017.
- Mariano, Jacqueline Barboza and Emilio Lèbre La Rovere. “Environmental Impacts of the Oil Industry.” *Encyclopedia of Life Support Systems* <http://www.eolss.net/sample-chapters/c08/e6-185-18.pdf>, accessed May 14, 2017.
- Mauerhofer, Volker (ed.). *Legal Aspects of Sustainable Development: Horizontal and Sectorial Policy Issues*. Springer International Publishing, 2016.
- Meadowcroft, James. “Who is in Charge Here? Governance for Sustainable Development in a Complex World.”. *Journal of Environmental Policy and Planning* 9 no.3-4 (November 2010): 299-314.

- Meadows, Donella H., Dennis L. Meadows, Jergen Randers and W.W. Behrens, *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*. New York: Universe Books, 1972.
- Mebratu, Desta. "Sustainability and Sustainable Development: Historical and Conceptual Review." *Environmental Impact Assessment Review* 18 no.6 (1998): 493-520.
- Menash, Adelina Maria and Luciana Camargo Castro. *Sustainable Resource Use and Sustainable Development: A Contradiction*. University of Bonn: Center for Development Research, 2004. https://www.zef.de/fileadmin/downloads/forum/docprog/Tempapers/2004_3b_Mensah_Castro.pdf accessed on June 7, 2018.
- Miles, Mathew B. and A Michael Huberman, *Qualitative Data Analysis*, 2nd ed. CA: Thousand Oaks, SAGE, 1994.
- Minu Hemmati, *Multi-Stakeholder Processes for Governance and Sustainability*, (Earthscan Publications, 2002), 250.
- MMSD, *Breaking New Ground: Mining, Minerals, and Sustainable Development* International Institute for Environment and Development, and World Business Council for Sustainable Development, (London: Earthscan Publications Ltd, 2002), 458
- Moniruzzaman, Md. "Comparison of some Asian Offshore Production Sharing Contracts with Respect to Bangladesh." Master of Engineering Thesis, Bangladesh University of Engineering & Technology, 2009. <http://lib.buet.ac.bd:8080/xmlui/handle/123456789/1488> accessed April 23, 2017.
- Moula, Golam, Fahamida Parvin and Jannatul Ferdaus. "The Prospects and Challenges before Bangladesh in Exploring and Exploiting Marine Resources: An Economic and Legal Study." *Beijing Law Review* 5(2014): 249-52.
- Munashinghe, Mohan. "Sustainomics: A Trans-disciplinary Framework for Making Development More Sustainable." Munashinghe Institute for Development (October 2000). <http://www.isecoeco.org/pdf/sustainomics.pdf> accessed on May 4, 2018.
- Murshid, K.A.S. and Arne Wiig. "A Review of Development Trends in The Energy Sector of Bangladesh." *Development Studies and Human Rights* 3(2001): 12.
- Myeres K and Mohammad A. *A Short Guide to Parliamentary Oversight of The Oil and Gas Sector for Parliament of Ghana* (New York: Natural Resource Governance Institute, 2012). <https://resourcegovernance.org/sites/default/files/PC-MPs-Short-Guide-On-Oil-Gas.pdf> accessed January 5, 2018.
- Myers, Keith and Abdul Karim Mohammed. "A Short Guide to Parliamentary Oversight of the Oil & Gas Sector for Parliament of Ghana." Natural Resource Governance Institute, New York. <http://oilandgasirc.org.gh/2017/04/a-short-guide-to-parliamentary-oversight-of-the-oil-and-gas-sector-for-the-parliament-of-ghana/>, accessed August 2, 2017.

- Namuyondo, Esther. "Sustainability and Oil Exploration in Uganda – the Case of Uganda's Albertine Region." Master Thesis, Aalborg University, Uganda, 2014.
- Nasreen, Mahmuda, Khondokar Mokaddem Hossain and Debashish Kumar Kundu, "The Interrelationship between Poverty, Environment and Sustainable Development in Bangladesh: An Overview." *Bangladesh e-Journal of Sociology* 3 no.2 (2006), <https://www.researchgate.net/publication/238622968>, accessed September 21, 2017.
- Nasrin, Farjana. "Waste Management in Bangladesh: Current Situation and Suggestions for Action." *International Research Journal of Social Sciences* 5, no.10 (2016): 36-42.
- National Biodiversity Strategy and Action Plan for Bangladesh, Ministry of Environment and Forests, Government of the People's Republic of Bangladesh , (August 2004). <https://drive.google.com/file/d/0B6XjGVIRbmt0aUlBTGYyeEhGZmc/view> accessed on October 13, 2019.
- Natural Resource Governing Institute. "Legal Framework: Navigating the Web of Laws and Contracts Governing Extractive Industries." *NRGI Reader* (March 2015). https://resourcegovernance.org/sites/default/files/documents/nrgi_primer_legal-framework.pdf accessed August 12, 2017.
- Neto, João Santos Coelho. "Risk-Bearing Service Contracts in Brazil." *Journal of Energy and Natural Resources Law* 3 (1985):114
- Neuman,W. Lawrence. *Social Research Methods: Qualitative and Quantitative Approach*, 6th ed. New York: Pearson International Edition, 2006.
- Nolan, Peter A. and Mark C. Thurber. "On the State's Choice of Oil Company: Risk Management and the Frontier of the Petroleum Industry." in *Oil and Governance: State-Owned Enterprises and the World Energy Supply* edited by D. Victor, D. Hults, and M. Thurber. Cambridge: Cambridge University Press, 2010.
- Norwegian Agency for Development Cooperation, "Evaluation of the Norwegian Petroleum-Related Assistance Case Studies Regarding Mozambique, Bangladesh, East Timor and Angola," (2007). <https://evalueringsportalen.no/evaluating/evaluation-of-the-norwegian-petroleum-related-assistance-case-studies-regarding-mozambique-bangladesh-east-timor-and-angola>, accessed July 28, 2017.
- Okuthe, Isaiah K. "Environmental and Social Challenges of Oil and Gas Exploration in Kenya." *International Journal of Innovation and Scientific Research* 17, no. 1 (August 2015): 164-74
- Onorato, William T. and J. Jay Park. "World Petroleum Legislation: Frameworks that Foster Oil and Gas Development." *Alberta Law Review*, 39 no. 1(2001): 70-126.
- OPEC. *I need to know: An Introduction to the Oil Industry and OPEC*. OPEC Secretariat, Public Relations & Information Department, Austria, 2013. https://www.opec.org/opec_web/static_files_project/media/downloads/publications/ChildrenBook2013.pdf accessed November 5, 2018.

- Overland, Indra. "Norway: Public Debate and the Management of Petroleum Resources and Revenues." In *Public Brainpower Civil Society and Natural Resource Management*, edited by Indra Overland. Palgrave Macmillan, 2018.
- Pallemearts, Marc. "International Environmental Law From Stockholm To Rio: Back To The Future?" *Review of European Community and International Environmental Law* 1, no. 3(August 2006): 254-66.
- Paul, Bac Dorin. "A History of the Concept of Sustainable Development: Literature Review." *The Annals of the University of Oradea* 17, no. 2 (2008): 576- 79. <http://www.cfr.washington.edu/classes.esrm.458/Paul.%202008.pdf> accessed on February 12, 2018.
- Petrobangla, "Annual Report 2017," 39
- Petrobangla, "Petroleum Exploration Opportunities in Bangladesh," Bangladesh Oil, Gas and Mineral Corporation, Dhaka, Bangladesh(2012), 48.
- Petrobangla, *Annual Report* (Dhaka:Petrobangla, 2017), 17.
- Pisano, Umberto, Andreas Endl and Gerald Berger *The Rio+20 Conference 2012: Objectives, Processes and Outcomes*. European Sustainable Development Network, 2012.
- Power Division. "Annual Report." Ministry of Power, Energy and Mineral Resources, Bangladesh, https://powerdivision.gov.bd/sites/default/files/files/powerdivision.portal.gov.bd/annual_reports, accessed October 10, 2020.
- Power System Master Plan 2016*, Power Division Ministry of Power, Energy and Mineral Resources, Government of the People's Republic of Bangladesh, 5.
- Quader, A K M A and Edmond Gomes. "An Exploratory Review of Bangladesh Gas Sector: Latest Evidence and Areas of Further Research." *CPD Occasional Paper Series 17* (2002). http://www.cpd.org.bd/pub_attach/op17.pdf accessed on July 12, 2017.
- Radon, Jenik. "The ABCs of Petroleum Contracts: License-Concession Agreements, Joint Ventures, and Production-sharing Agreements." In *Covering Oil: A Report Guide to Energy and Development* edited by S. Tsalik and A. Schiffrin. Open Society, 2005. available at <https://www.gmec-ee.com/wp-content/uploads/2013/08/The-ABCs-of-Petroleum-Contracts....pdf>. accessed on November, 1 2018.
- Radtke, Cameron, Daniel A. Autenrieth, Tiffany Lipsey and William J. Brazile. "Noise Characterization of Oil and Gas Operations." *Journal Occupational and Environmental Hygiene* 14 (2017): 659-66.
- Remy, Felix and Gary MacMahon. *Large Mines and Local Communities: Forging Partnerships, Building Sustainability* World Bank Group's Mining Department, 2002. <http://siteresources.worldbank.org/INTOGMC/Resources/largemineslocalcommunities.pdf> accessed July 3, 2018

- River Management Improvement Programme (RMIP), *Environmental Management Framework (EMF)*, Bangladesh Water Development Board, Ministry of Water Resources, Government of the People's Republic of Bangladesh (February 2015).
- Robert K. Yin, *Case Study Research: Design and Methods* (5th edn.), (SAGE Publications, 2014),13.
- Rockwood, Larry, Ronald Stewart and Thomas Dietz, *Foundations of Environmental Sustainability*. New York: Oxford University Press, 2008.
- Rosness, Ragnar, Helene C. Blackstad, Ullah Forseth, Irene B. Dhale and Siri Wiig. "Environmental Condition for Safety Work-Theoretical Foundation." *Safety Science* 50, no. 10 (2012):1967-76
- Ross, Prizzia. "Sustainable Development in an International Perspective." In *Handbook of Globalization and the Environment*, edited by Khi V. Thai, Dianne Rahm and Jerrel D. Cogburn. Boca Raton: CRC Press, 2007.
- Saavedra, Miguel de Cervates. "Back to Basics - Dutch Disease: Too Much Wealth Manage Unwisely." *Finance and Development*, 40 no. 1 (2003). International Monetary Fund <http://www.imf.org/external/pubs/ft/fandd/2003/03/ebra.htm> accessed on October 20, 2020.
- Sadiq, Shazia, Guido Governatori and Kioumars Naimir. "Modeling Control Objectives for Business Process Compliance," in Proceedings of *5th International Conference on Business Process Management* Springer-Verlag, (2007).
- Saidu, Adamu Saleh, Piyush, Tomar and Mohammed Sagir Saleh. "Study on the Effect of Noise Pollution in the Oil and Gas Industry." *International Journal for Advanced Biological Science* 7, no. 4,(2017): 813-16.
- Salter, Michael and Julie Mason. *Writing Law Dissertations: An Introduction and Guide to the Conduct of Legal Research*. Pearson, 2007.
- Sands, Philippe, *Principle of International Environmental Law*. Cambridge: Cambridge University Press, 2003.
- Schrijver, Nicolaas Jan. *Sovereignty Over Natural Resources: Balancing Rights and Duties*. Cambridge University Press, 1997. <https://www.rug.nl/research/portal/files/3265518/dissertatie.pdf> accessed on May 12, 2018.
- Segger, Marie-Clarie Cordonier and Ashfaq Khalfan. *Sustainable Development Law: Principles, Practices & Prospects*. (Oxford: Oxford University Press, 2004.
- Segger, Marie-Claire Cordonier. "Significant Developments in Sustainable Development Law and Governance: A Proposal." *Natural Resources Forum* 28 (2004): 61–74.
- Shelton, Dinah. *Stockholm Declaration (1972) and Rio Declaration (1992) Max Planck Encyclopedia of Public International Law*. Oxford: Oxford University Press, 2008.

- Shields, Deborah J. "Applying Sustainable Development Principles and Sustainable Operating Practices in Shale Oil and Gas Production." *The Open Petroleum Engineering Journal* 9 (2016): 137-49.
- Shokola1, Yana V., Lyubov V. Khoreva and Alexandr V. Shraer. "Innovative and Sustainable Development of Oil and Gas Complex." In Proceedings of *IEEE NW Russia Young Researchers in Electrical and Electronic Engineering Conference* (2017).
- Singh, Lachmi. "*The United Nation Convention on Contracts for the International Sales of Goods 1980 (CISG) An examination of the buyers remedy of avoidance under the CISG: How is the remedy interpreted, exercised and what are the consequences of avoidance?*" PhD Thesis, University of the West of England, 2015.
- Sohn, Louis B. "The Stockholm Declaration on the Human Environment." *Harvard International Law Journal* 14 no.3 (1972): 423.
- Sommerlad, Hilary. "Researching and Theorising the Processes of Professional Identity Formation." *Journal of Law and Society* 34 no. 2 (May, 2007): 190-217.
- Soni, Anmol and Anomitra Chatterjee. "Governance of the Petroleum and Natural Gas Sector in India: A Status Note," The Energy and Resources Institute, *TERI-NFA Working Paper Series* no. 15, (March 2014), 16 <https://www.teriin.org/projects/nfa/2008-2013/pdf/working-paper-15-Governance-of-the-petroleum-and-natural-gas-sector-in-india-a-status-note.pdf> accessed on May 19, 2018
- Stockholm Declaration of the UN Conference on the Human Environment (16 June 1972) UN Doc A/Conf 48/14/Rev.1, 11 ILM 1461 and Rio Declaration, Principle 4.
- Stockholm Declaration of the UN Conference on the Human Environment (16 June 1972) UN Doc A/Conf 48/14/Rev.1, 11 ILM 1461
- Su, Yi and Kedong Luo. "Study on the Sustainable Development of Natural Gas Resources in China." *Journal of Clean Energy Technologies* 3, no. 6 (November, 2015): 445-49.
- Su, Yi and Kedong Luo. "Study on the Sustainable Development of Natural Gas Resources in China." *Journal of Clean Energy Technologies* 3 no. 6 (November 2015): 445-449.
- Subai, Pereowei. "*Towards A Functional Petroleum Industry In Nigeria: A Critical Analysis of Nigeria's Petroleum Industry Reform.*" Ph.D Thesis, Newcastle Law School, 2014.
- Sultana, Reajmin. "Application of Environmental Accounting Reporting Practices and Problems Regarding the Presentation of it in Bangladesh (A Case Study on Fossil-fuel Sector)." *European Scientific Journal* 13, no.2 (2017):348-61.
- Tadeo, Paulson Erot. "*A Comparative Study of Oil Resource Management in Norway and Nigeria: Lessons for Kenya.*" Master Thesis, University of Nairobi, 2016.
- Tamim, M. "Policies and Priorities in Bangladesh Gas Sector Planning." *Energy for Sustainable Development* 7, no. 2(2003): 757-65.

- Ted Zorn, “Designing and Conducting Semi-Structured Interviews for Research” <http://home.utah.edu/~u0326119/Comm4170-01/resources/Interviewguidelines.pdf> (accessed August 20, 2017)
- The Centre for International Sustainable Development Law (CISDL). “Sustainable Developments in Recent WTO Law and ‘Jurisprudence.’” *Fifth Session of The Ministerial Conference of the World Trade Organization* Cancun, Sept. 10-14, 2003. www.cisd.org/pdf/brief_common.pdf accessed April 7, 2018.
- The World Bank. “Performance Audit Report.” People's Republic of Bangladesh Petroleum Exploration Promotion Project, The World Bank, Report No. 12114 (June 30, 1993). <http://documents1.worldbank.org/curated/en/394831468914755654/pdf/12114-PPAR-REVISED-PUBLIC.pdf> accessed on May 10, 2019.
- Thornton, Margaret. *Dissonance and Distrust—Women and the Legal Profession*. Oxford: Oxford University Press, 1996.
- Thurber, Mark C., David R. Hulst and Patrick R.P. Heller. “Exporting the Norwegian Model: The Effect of Administrative Design on Oil Sector Performance.” *Energy Policy* 39, no. 9 (2011): 5366-5378.
- Tienhaara, Kyla. “Foreign Investment Contracts in the Oil & Gas Sector: A Survey of Environmentally Relevant Clauses.” *Sustainable Development Law & Policy* 11, no. 3 (2011): 15-20, 39-40.
- Tiny, Kiluange. “The JDZ Model PSC: A Legal Analysis.” *JuriSTEP* (August 2005) . Available at <https://resourcegovernance.org/sites/default/files/JDZ%20model%20K.pdf> accessed 10 October 2020
- Toft, Peter and Arash Duero. “Reliable in the Long Run? Petroleum Policy and Long-term Oil Supplier Reliability.” *Energy Policy* 39, no. 10 (2011): 6583-94.
- Toni Eerola, *Corporate Social Responsibility in Mineral Exploration –The Importance of Communication and Stakeholder Engagement in Earning and Maintaining the Social License to Operate*, (Geological Survey of Finland, 2017).
- Tordo, Silvana, David Johnston and Daniel Johnston. “Petroleum Exploration and Production Rights : Allocation Strategies and Design Issues.” *World Bank Working Paper* no. 179 (2009). <https://openknowledge.worldbank.org/handle/10986/5954> accessed January 15, 2018.
- Ugochukwu, Collins N.C. and Jürgen Ertel. “Negative Impacts of Oil Exploration on Biodiversity Management in the Niger Delta Area of Nigeria.” *Impact Assessment and Project Appraisal* 26, no.2 (June 2008): 139–47. <http://www.ingentaconnect.com/content/beechn/iapa> accessed on December 12, 2019.
- UNCCUR Proceedings, vol 1: Plenary Meetings(E/Conf.7/7)
- UNEP, *From Conflict to Peace Building: The Role of Natural Resources and the Environment*. UNEP, 2009. <https://wedocs.unep.org/handle/20.500.11822/7867>

- United Nations and Global Compact, *Sustainable Energy for all: Opportunities for the Oil and Gas Industry*, (Accenture,2012). www.accenture.com accessed on December 11, 2020.
- United Nations Commission on Sustainable Development (UNCSD), “Framing Sustainable Development: The Brundtland Report – 20 Years On” (2007). https://www.un.org/esa/sustdev/csd/csd15/media/backgrounder_brundtland.pdf accessed on March 19, 2018
- United Nations Environment Program (UNEP), ‘Report of the U.N. Conference on the Human Environment’ (1992) A/CONF.48/14
- United Nations World Commission on Environment and Development (UNWCED), *Our Common Future (Brundtland Report)*, (Oxford: Oxford University Press, 1987).
- Veil, John A. “Drilling Waste Management: Past, Present, and Future,” Society of Petroleum Engineers.” *SPE Annual Technical Conference and Exhibition*, 29 September-2 October, San Antonio, Texas (2002).
- Victor, David G., David R. Hults and Mark C. Thurber, *Oil and Governance: State-Owned Enterprises and the World Energy Supply*. Cambridge: Cambridge University Press, 2011.
- Vinogradov, Sergei. “Environmental Protection in the Petroleum Industry.” In *Encyclopaedia of Hydrocarbons*, edited by Carlo Amadei, 507-523.. Roma: Eni, 2005. http://www.treccani.it/export/sites/default/Portale/sito/altre_aree/Tecnologia_e_Scienze_applicate/enciclopedia/inglese/inglese_vol_4/507-524_x10.3x_ing.pdf, accessed September 2, 2017.
- Wahid, Adnan Al and Nadia Rawshan. “Exploration Activities in Bangladesh Gas.” *BRAC University Journal*, 1, no. 1 (2004): 33-40.
- Weaver, Jacqueline Lang. “Sustainable Development in the Petroleum Sector.” In *Energy Law and Sustainable Development*, edited by Adrian J. Bradbrook and Richard L. Ottinger. International Union for the Conservation of Nature (IUCN), 2003. <http://www.ugandaoilandgas.com/linked/sustainable%20development%20in%20the%20petroleum%20sector.pdf>, accessed July 8, 2017.
- Webley, Lisa. “Qualitative Approaches to Empirical Legal Research.” In *The Oxford Handbook of Empirical Legal Research* edited by Peter Cane and Herbert M. Kritzer. Oxford: Oxford University Press, 2010. DOI: 10.1093/oxfordhb/9780199542475.013.0039.
- Whittaker, Martin. “Emerging ‘Triple Bottom Line’ Model for Industry Weights Environmental, Economic and Social Considerations.” *Oil & Gas Journal* 23 (1999): 97.
- Wirth, David A. “The Rio Declaration on Environment and Development: Two Steps Forward and One Back, Or Vice Versa?” *Georgia Law Review* 29 (1995):599-653
- Wood, *Best Available Techniques Guidance Document on Upstream Hydrocarbon Exploration and Production*. European Commission, 2019.

<https://op.europa.eu/en/publication-detail/-/publication/f9265d2b-574d-11e9-a8ed-01aa75ed71a1/language-en/format-PDF/source-93598867> accessed on May 11, 2020.

World Bank and International Finance Corporation. *Large Mines and Local Communities: Forging Partnerships, Building Sustainability*. World Bank Group's Mining Department, 2002. https://nanopdf.com/download/global-mining-m-i-n-i-n-g-a-n-d-e-v-e-l-o-p-m-e-n_pdf accessed on November 21, 2019.

Newspaper Articles and Websites

“Bangladesh: Gas explosion: Compensation from Niko, Unocal Demanded,” *The New Nation*, June 13, 2006. <http://www.corpwatch.org/article.php?id=13727>, accessed September 20, 2017.

“Terms Used in the Oil Industry: Institutional Data Base” <http://www.ri.pemex.com/files/content/Glossary%20201101071.pdf> accessed on August 10, 2017.

Adhikary, Tuhin Shubhra and Rezaul Karim Byron. “Tengratila Blowouts: Niko Liable, Must Pay Damages.” *The Daily Star*, May 4, 2020.

Ahmed, Tasmiah Nuhiya. “ICSID Tribunal Verdict: Dhaka Wins Compensation Case Against Oil Giant Niko, State Minister for Power: ‘B’desb may Get \$1bn Compensation.” *The Daily Our Time*, May 4, 2020. <http://www.ourtimebd.com/beta/2020/05/04/icsid-tribunal-verdict-dhaka-wins-compensation-case-against-oil-giant-niko-state-minister-for-power-bdesb-may-get-1bn-compensation>. accessed on July 7, 2020.

Asian Development Bank. “Economic Indicators for Bangladesh.” <https://www.adb.org/countries/bangladesh/economy>, accessed August 8, 2020.

BD Yellow Pages. “Bangladesh Oil and Gas Mineral Corporation,” Online Business Directory <http://bdyellowpages.net/description/BangladeshOilandGasMineralCorporation> accessed May 10, 2019

Begum, Shahnaj. “ICSID Tribunal Verdict: Dhaka Wins Compensation Case Against Oil Giant Niko.” *The Daily Observer*, May 3, 2020. <https://www.observerbd.com/details.php?id=271484> accessed on May 10, 2020.

Bhuiyan, Kamal Uddin and Md. Jahangir Alam, “Niko Case and the Prospect of Foreign Investment in Bangladesh.” *The Daily Star*, November 17, 2014.

British Petroleum. “Statistical Review of World Energy 2012.” British Petroleum (2012), http://www.bp.com/assets/bp_internet/globalbp/globalbp_uk_english/reports_and_publications/statistical_energy_review_2011/STAGING/local_assets/pdf/statistical_review_of_world_energy_full_report_2012.pdf, accessed March 13, 2017.

Chappell, Bill. “U.S. Settles Claims Against BP Over Deepwater Horizon Spill For \$20 Billion.” *The National Public Radio*, October 5, 2015. <https://www.npr.org/sections/thetwo-way/2015/10/05/445983039/u-s-resolves-claims-against-bp-over-deepwater-horizon-spill> accessed on June 11, 2020.

- Desk Report, “Bangladesh Eligible for UN ‘Developing Country’ Status.” *bdnews24.com*, March 17, 2018. <https://bdnews24.com/bangladesh/2018/03/17/bangladesh-eligible-for-un-developing-country-status> accessed August 3, 2020.
- Directorate General of Hydrocarbons. “Good International Petroleum Industry Practices (GIPIP).” Ministry of Petroleum and Natural Gas, Government of India (2016). http://petroleum.nic.in/sites/default/files/GIPIP_Final_approved.pdf accessed on December 11, 2019.
- EB Reports. “Speedy Supply of Power and Energy Act, 4 Years Extension.” *Energy Bangla*, July 21, 2014. <https://energybangla.com/speedy-supply-power-energy-act-4-years-extension/> accessed on January 11, 2020
- Eberspaecher, Kai. “Sustainable Development in Oil and Gas.” *Advisian* September 8, 2017. <https://www.advisian.com/en/global-perspectives/sustainable-development-in-oil-and-gas> accessed on January 10, 2020.
- Elizabeth C. Ramos, “Social Sustainability in Oil and Gas Projects,” Ernst & Young Global Limited, <https://eylaw.ey.com/2018/09/20/social-sustainability-in-oil-and-gas-projects/> accessed on September 25, 2019
- ETU, “The Policy and Law Making Process.” Education and Training for Democracy & Development. <https://www.etu.org.za/toolbox/docs/govern/policy.html> accessed on July 10, 2019.
- Franta, Benjamin. “On its 100th birthday in 1959, Edward Teller Warned the Oil Industry about Global Warming.” *The Guardian*, January 1, 2018. <https://www.theguardian.com/environment/climate-consensus-97-per-cent/2018/jan/01/on-its-hundredth-birthday-in-1959-edward-teller-warned-the-oil-industry-about-global-warming> accessed on November 11, 2019.
- Khan, Sharier. “Bibiyana Field Much Larger than Thought.” *The Daily Star*, January 19, 2013.
- Law Aspect. “A Study on Accounting Systems of Petrobangla.” <https://lawaspect.com/study-accounting-systems-petrobangla/> accessed on July 15, 2020
- Lawsuits. “US Deepwater Horizon Explosion & Oil Spill Lawsuits.” *Business and Human Rights Resource Centre*, April 25, 2010. <https://www.business-humanrights.org/en/us-deepwater-horizon-explosion-oil-spill-lawsuits> accessed on May 25, 2020.
- Macalister, Terry. “Piper Alpha Disaster: How 167 Oil Rig Workers Died.” *The Guardian*, July 4, 2013. <https://www.theguardian.com/business/2013/jul/04/piper-alpha-disaster-167-oil-rig>, accessed July 26, 2017.
- Mathiesen, Karl. “Climate Change and Poverty: Why Indira Gandhi's Speech Matters.” *The Guardian*. May 6, 2014. <https://www.theguardian.com/global-development-professionals-network/2014/may/06/indira-gandhi-india-climate-change> accessed on October 10, 2017.

- Mcarthur, Greg. "Niko Resources: Ottawa's Corruption Test Case." *The Globe and Mail*, August 25, 2011. <https://www.theglobeandmail.com/report-on-business/rob-magazine/niko-resources-ottawas-corruption-test-case/article542842/> accessed on January 18, 2020.
- Milan, Oliver. "Oil Industry Knew of 'Serious' Climate Concerns More than 45 Years Ago." *The Guardian* April 13, 2016. <https://www.theguardian.com/business/2016/apr/13/climate-change-oil-industry-environment-warning-1968> accessed November 11, 2019.
- MoPEMR. "Bangladesh Oil, Gas and Mineral Corporation," Ministry of Power, Energy and Mineral Resources, available at https://www.mpemr.gov.bd/public_service/details/4 accessed on May 10, 2019.
- Moulvibazar Correspondent. "No Compensation of Blowout in 19 Years." *The New Nation*, October 07, 2017, <http://thedailynewnation.com/news/97027/no-compensation-of-blowout-in-19-years.html>, accessed October 7, 2017.
- Nabi, Md. Saidun. "Petrobangla, Bapex Slammed Heavily for 'Below Par Performance.'" *The Dhaka Tribune*, December 15, 2019. <https://www.dhakatribune.com/bangladesh/dhaka/2019/12/15/petrobangla-bapex-slammed-heavily-for-below-par-performance> accessed on 15 March 2020.
- Petrobangla <http://petrobangla.org.bd/?params=en/gasblockandreserve/reserve/> accessed November 30, 2016.
- Podrabsky, Mary. "Key Informant Interview Handbook." University of Washington. <http://courses.washington.edu/nutr531/HEBD/KIInterviews/KeyInformantInterviewHandbook.pdf> (accessed July 25, 2017).
- Rahman, M. Azizur. "Bibiyana Gas-Field Overproducing Due to 'Govt Pressure.'" *The Financial Express*, August 07, 2018.
- Rahman, M. Azizur. "Bangladesh Cabinet approves 4-year Extension of Special Law for Energy, Power Projects." *S & P Global Platts*, August 27, 2014, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/082714-bangladesh-cabinet-approves-4-year-extension-of-special-law-for-energy-power-projects> accessed on January 9, 2020.
- Rahman, M. Shamsur. "Wetlands: Nature's Boon for Bangladesh," *The Independent*, February 24, 2019
- Rasel, Aminur Rahman. "Bapex Discovers New Gas Field in Bhola." *The Dhaka Tribune*, December 13, 2018.

- Ship & Shore. "Pollution Control Technologies for the Oil & Gas Sector." <https://shipandshore.com/pollution-control-technologies-oil-gas-sector/> accessed on December 11, 2019.
- Sobhan, Zafar. "Re: Incompetent Lawyers Costing Country Dear," *Daily Online Alochona*, May 31, 2011. <https://dailyalochona.blogspot.com/2011/05/alochona-re-incompetent-lawyers-costing.html> accessed on October 29, 2019
- Society for Mining, Metallurgy and Exploration. "The Mining Industry and Sustainable Development." (2016). https://www.eenews.net/assets/2016/06/29/document_pm_01.pdf accessed on November 8, 2018.
- Staff Correspondent. "Bangladesh Wins Compensation From Niko Over 2005 Gas Field Blowouts." bdnews24.com, May 3, 2020. <https://bdnews24.com/business/2020/05/03/bangladesh-wins-compensation-from-niko-over-2005-gas-field-blowouts#:~:text=An%20international%20tribunal%20has%20ordered,in%20Sunamgaj's%20Chhatak%20in%202005> accessed on June 20, 2020.
- Star Online Report. "Country's Gas Reserve will be Exhausted in 11 Years: Nasrul Hamid." *The Daily Star*, January 20, 2020. <https://www.thedailystar.net/country/news/countrys-gas-reserve-may-be-exhausted-11-years-nasrul-hamid-1856629> accessed, September 10, 2020.
- Sustainable Knowledge Platform. "Transforming Our World: the 2030 Agenda for Sustainable Development." <https://sustainabledevelopment.un.org/post2015/transformingourworld> accessed on January 10, 2018
- TBS Report. "Thrust On Scrapping Unconstitutional Speedy Energy Supply Law." *The Business Standard*, July 10, 2020, <https://tbsnews.net/bangladesh/energy/thrust-scrapping-unconstitutional-speedy-energy-supply-law-104563> accessed on October 3, 2020
- The Age. "Flee Fire at Bangladesh Gas Field." *The Age*, June 26, 2005. <http://www.theage.com.au/news/world/villagers-flee-fire-at-bangladesh-gas-field/2005/06/26/1119321947220.html>, accessed May 22, 2017.
- The World Bank. "Bangladesh Development Update: Economy Requires Focus on Sustainable and Inclusive Growth." <http://www.worldbank.org/en/news/feature/2016/04/30/bangladesh-development-update-bangladesh-economy-requires-focus-on-sustainable-and-inclusive-growth-moving-forward> accessed on July 18, 2017.
- The World Bank. <https://www.worldbank.org/en/country/bangladesh/overview>, accessed August 3 2020.
- Tithi, Naznin. "Striking a Balance between Development and Environment: *Development without Environmental Protection cannot be Sustainable.*" *The Daily Star*, May 4, 2019.

Tribune Desk. “Compensation Still Lacking 22 Years on from Magurchara Tragedy.” *The Dhaka Tribune*, June 14, 2019. <https://www.dhakatribune.com/bangladesh/nation/2019/06/14/compensation-still-lacking-22-years-on-from-magurchara-tragedy> accessed on May 23, 2020.

U.S. Energy Information Administration <https://www.eia.gov/> (accessed May 14, 2017).

UCLA Center for Health Policy Research. “Key Informant Interviews.” http://healthpolicy.ucla.edu/programs/health-data/trainings/Documents/tw_cba23.pdf accessed on July 25, 2017.

UNDP Bangladesh. “Bangladesh's Progress on the MDGs.” <http://www.bd.undp.org/content/bangladesh/en/home/post-2015/millennium-development-goals.html> accessed on January 10, 2017)

UNDP. “Take Actions to Sustainable Development Goals.” <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> accessed on November 13, 2019.

United Nations Conference on Environment and Development, Rio de Janeiro (Rio Conference), (A/CONF.151/26, June 1992), Vol. I, Annex I. <http://www.un.org/documents/ga/conf151/aconf15126-1.htm> accessed on December 08, 2017.

United Nations, Outcome Document of the United Nations Conference on Sustainable Development (Rio+20 Conference) Rio de Janeiro, Brazil, 20–22 June 2012 <https://sustainabledevelopment.un.org/content/documents/733FutureWeWant.pdf> Accessed January 9, 2018.

Urribarri, Sailu and Marianna Parraga. “Explosion Kills 39 at Venezuela's Biggest Refinery.” *The Reuters*, August 26, 2012. <http://www.reuters.com/article/us-venezuela-refinery/explosion-kills-39-at-venezuelas-biggest-refinery-idUSBRE87O02R20120826>, accessed July 25, 2017.

World Bank. (2015). *Adjusted Savings: Natural Resources Depletion (% of GNI)*. <http://data.worldbank.org/indicator/NY.ADJ.DRES.GN.ZS>

World Summit on Sustainable Development (Johannesburg Summit), (A/CONF.199/20, September 2002), Chapter 1, Resolution 1. <https://sustainabledevelopment.un.org/milestones/wssd> accessed September 12, 2018.

APPENDICES

- A. CONSENT FORM**
- B. QUESTIONNAIRE FOR INTERVIEW**
- C. ARTICLE PUBLISHED IN RAJSHAHI UNIVERSITY LAW REVIEW**
- D. ACCEPTANCE LETTER FROM THE JOURNAL OF THE INSTITUTE OF BANGLADESH STUDIES**
- E. ARTICLE PUBLISHED IN THE JOURNAL OF THE INSTITUTE OF BANGLADESH STUDIES**

APPENDIX A

CONSENT FORM

Name of the Researcher

Mst. Momotaz Khatun
 Assistant Professor
 Department of Law University of Rajshahi
 PhD Student, Institute of Bangladesh Studies
 University of Rajshahi, Bangladesh
 Email: momolaw@gmail.com

Supervisor

Prof. Abu Naser Md. Wahid
 Department of Law
 University of Rajshahi
 E-mail: anmwahid@ru.ac.bd

Title: Inquest of Sustainable Development: Regulatory Framework of Upstream Operation of Natural Gas in Bangladesh

My name is Mst. Momotaz Khatun, and I am an Assistant Professor in the Department of Law University of Rajshahi studying PhD in the Institute of Bangladesh Studies, University of Rajshahi, Bangladesh. I would like to invite you to participate in my above-mentioned PhD research interview. To carry out my study I need to conduct several semi-structured interviews. The focus of these interviews is to collect information regarding the regulatory framework on the sustainable upstream operation of Natural gas in Bangladesh. The outcome of these semi-structured interviews will be analyzed to extract the legal regulation issues regarding the sustainable development of natural gas in Bangladesh.

With your permission, the interview would be audio recorded. Your participation would require approximately 30 minutes of your time. You have the option of participating anonymously. I would expect that the contribution of your interview will be made in your official capacities. Any material that represents your personal views will remain strictly confidential.

If you choose to participate anonymously, all records or your participation would be confidential. Only my supervisor and I will have access to information in which you are identified. With your permission, the interview would be audio recorded and later transcribed into writing. At your request, you will be provided a copy of the transcript and invited to make changes to the transcript as you wish. All data and signed consent forms and paper copies of interview transcripts will be stored in a locked file cabinet in my home.

Your participation is completely voluntary. You may withdraw from the study at any time where practicable, for any reason, and without explanation. If you choose to withdraw from the study, all information you provided during the interview would be withdrawn from the study and destroyed.

I have read and understand the information provided above, and hereby consent to participate in this research under the following conditions:

I consent to the interview being audio recorded. Yes No

I consent to having my personal identity disclosed in the products of the research. Yes No

I consent to being quoted in the products of the research. Yes No

Participant's Name _____ Signature _____

APPENDIX B

QUESTIONNAIRE FOR INTERVIEW

Title: Inquest of Sustainable Development: Regulatory Framework of Upstream Operation of Natural Gas in Bangladesh

Researcher: Mst. Momotaz Khatun, PhD Fellow, Institute of Bangladesh Studies, University of Rajshahi

Affiliation: Assistant Professor, Department of Law, University of Rajshahi

Supervisor: Prof. A.N.M. Wahid, Department of Law, University of Rajshahi

Name of the Respondent:

Organization:

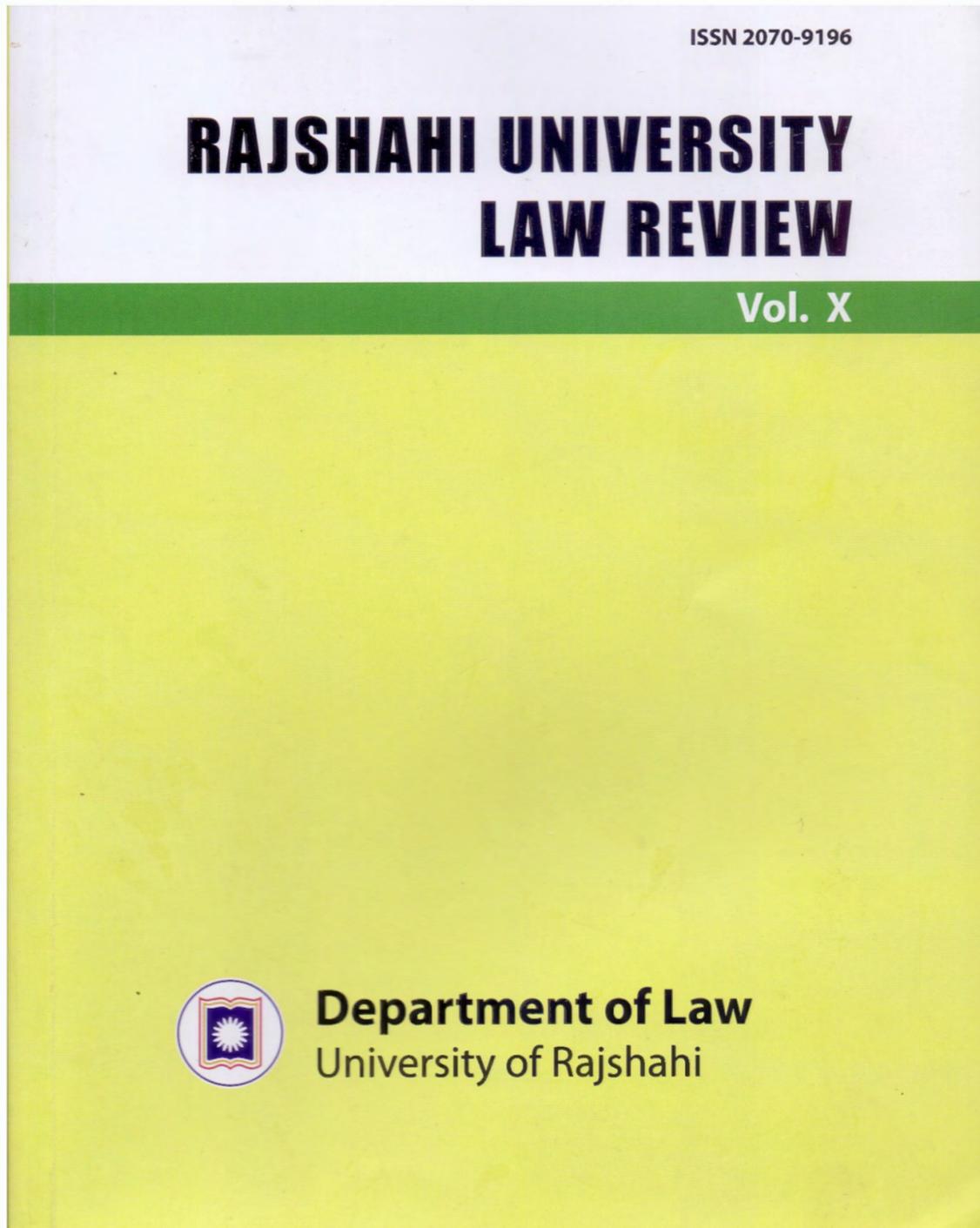
1. I would like to start by asking you to describe your involvement with oil and gas sector. When and how involved?
2. Natural gas resource is the main source of energy and plays vital role to the economy of Bangladesh. Sustainable development is considered the ultimate goal for modern legislation of oil and gas. Please describe your perception regarding sustainable development principles in the context of natural gas or oil resource?
3. To what degree do you consider the laws and regulation of Bangladesh for oil and gas exploration being effective in promoting and adopting principles of sustainable development?
Is there any Barrier?
Is there any need for Improvement?
4. Please comment on how the government of Bangladesh secured the features of community consultation and access to information in the petroleum legislation and practice.
5. Please comment on whether there is clear accountability and transparency of Petrobangla as a regulatory authority of natural gas management?
6. Please comment on the mechanism to ensure the compliance of natural gas producing companies with the national and international laws and regulations in practice.
7. The national biodiversity strategy and action plan requires the links between sectors and stakeholders, government departments and NGOs, donors and local communities, private sector and policy makers play vital role in achieving sustainable methods of conserving biodiversity. As the natural gas exploration and production has some negative impact on biodiversity, how far it is maintained in case of granting Environment clearance certificate (ECC) to natural gas extraction project.
8. The *national biodiversity and action plan* (2004) suggested to develop methodology to integrate biodiversity concern in Environmental Impact Assessment (EIA) and Socio-economic Impact Assessment (SEA) etc. A considerable time has already passed, whether it is followed in EIA and SEA of natural gas operation?
9. The natural gas is a non-renewable resource of which depletion is inevitable, in this case how the sustainable development of natural gas can be ensured?
10. After the adoption of the petroleum policy 1993, the exploration and production was increased as a result four contracts were signed with the IOCs, after then no new policy is adopted. Do you think it has some impact on sustainable development of natural gas in Bangladesh?
11. The petroleum Act was enacted in 1974 after that no new Act or revision was made to incorporate the provisions of sustainable development though a number of laws were enacted concerning the downstream activities of natural gas. What is your opinion about this?
12. As the demand of gas is increasing day by day and the gas sector master plan suggests to update the upstream legal and regulatory framework relating to natural gas. Does it ensure the sustainable development of this sector?
13. The first petroleum Act was enacted in 1934 and following this the petroleum rule was enacted in 1937, thereafter the petroleum Act of 1948 was enacted and following this the petroleum rule of

- 1949 was adopted. However, no rule was formulated under the Petroleum Act 1974, which is now in operation. What is the reason behind this?
14. The success rate of gas field in Bangladesh is one in every three drillings but the gas initially in place is not satisfactory, how far the principle of cost benefit is analyzed where the reserve is comparatively low?
 15. Do you think that to ensure the sustainable development of natural gas the upstream activities can be divided between two organs, one is for legal and policy section and another is for bidding and PSC activities?
 16. How far the model production sharing contracts are followed in case of actual contract?
 17. The model production sharing contracts of Bangladesh state that the companies will comply with the good international petroleum practice for the protection and preservation of the environment. What is the meaning of 'good international practice' in this regard?
 18. The MPSC states that the company should follow the good international petroleum practice, standard of international petroleum industry and the applicability of the domestic law in case of validity, interpretation and implementation of the contract. In this case, if any conflict arises then which one will prevail?
 19. Under what circumstances and subject to what amount of reserve the operating authority can declare a well as abandoned?
 20. Do you think that the average percentage of recovery for a particular gas field in Bangladesh is satisfactory? (What may be the possible reasons for low percentage of recovery?)
 21. Petrobangla works as a regulatory authority of natural gas extraction and at the same time participates in the operation sometime in a joint venture or independently, how the conflict of interest managed in this particular situation?
 22. Do you suggest any reform to be introduced in the legal framework to conduct the sustainable gas extraction in Bangladesh?

Thank you very much for your invaluable opinion and kind cooperation.

APPENDIX C

ARTICLE PUBLISHED IN RAJSHAHI UNIVERSITY LAW REVIEW



CONTENTS

Gambia's Genocide Claim against Myanmar: An Appraisal on Jurisdiction of International Court of Justice (ICJ) ATM Enamul Zahir Dr. Sayeeda Anju	1-11
Dowry Statutes: A Vain Venture Dr. Begum Asma Siddiqua	12-28
Legal Response to Activate the Village Courts in Bangladesh: Prospects and Challenges Dr. Md Abdur Rahim Mia	29-49
Settlement of Disputes under International Civil Aviation Organization Dr. Md. Sahal Uddin ATM Enamul Zahir	50-62
Reforms in Juvenile Justice Laws: Bangladesh Perspective Dr. Nahid Ferdousi	63-77
Development of Laws Regarding Transfer of Property in Bangladesh: An Appraisal KMS Tareq	78-93
Cell Tower Radiation and International Standards on Limiting Exposure: A Critical Appraisal Md. Raisul Islam	94-118
Cybercrime Against Women in Bangladesh: Issues, Challenges and Legal Response Md. Safiullah Md. Abdur Rahim	119-135
Reintegration of the <i>Hijra</i> People into the Mainstream of Society in Bangladesh: A Socio-Legal Study Md. Salauddin Saimum	136-148
Post-Divorce Maintenance of a Muslim Woman: A Critical Analysis in the Perspective of Indian Sub-Continent Md. Tasnim Ferdous Md. Nadir Khan	149-163
Assessing Legal and Institutional Framework for Natural Gas Extraction in Bangladesh Mst. Momotaz Khatun	164-189
A Critical Analysis of Parents' Maintenance Act, 2013 in Bangladesh Mst. Rezwana Karim	190-206
The Prevention and Suppression of Human Trafficking Act, 2012: A Critical Analysis Uzma Shukrana Nasmin Jabin Noor	207-224
বাংলাদেশে মুসলিম উত্তরাধিকার আইনে পুত্র ও কন্যা সন্তানের অধিকার: একটি পর্যালোচনা মেহম্মদ হেলায়েত উল্লাহ	225-246

Assessing Legal and Institutional Framework for Natural Gas Extraction in Bangladesh

Mst. Momotaz Khatun*

Abstract

Bangladesh has been performing petroleum activities for long time. The country has discovered 27 gas fields with the help of national and international oil companies. Natural gas is the major source of energy in Bangladesh and it plays a vital role in the economic sector. There are several laws to govern the petroleum operations in Bangladesh. Bangladesh Oil, Gas and Mineral Corporation, which is commonly known as Petrobangla, is the prime institution to carry on the petroleum operation through its affiliated companies or international oil companies by contractual agreement like production sharing contract. Model production sharing contracts have been prepared to this purpose. This paper provides an overview of, and analyse the existing legal, institutional and policy frameworks for the upstream activities of natural gas in Bangladesh. The paper also makes some relevant comparison with some other petroleum producing countries and list a number of limitations of the current legislative and institutional framework to ensure sustainable natural gas extraction.

Keywords: Petroleum operation, Sustainable development, Legal and regulatory framework, Upstream activity, Petrobangla

1. Introduction

Natural gas has been playing very important role in the economy of Bangladesh since the early 1960's. Natural gas has been the principal fuel in the country for a quite long time due to its affordable price and

* Assistant Professor, Department of Law, University of Rajshahi
E-mail: momolaw@gmail.com

widespread use. Natural gas accounts for about 75% of commercial primary energy and more than half of all primary energy supplies in the country. Although the energy mix of Bangladesh is diversifying slowly, it is indeed a constant challenge to ensure supply of natural gas resources to fuel the economic growth of the country against the sharply rising demand.¹ Recently Bangladesh has discovered more natural gas² as well as oil³ in some gas fields. Natural gas is not only solidifying the backbone of the economy of Bangladesh, but also maintains the harmony with nature due to its inherent property⁴. These factors emphasize to know how the natural gas sector is managed through policies, laws and institutions to ensure the sustainability of the resource.

It is assumed that there is a direct effect of sound legal and institutional framework in oil and gas sector performance which is also acknowledged by many authors.⁵ The Norwegian Model of petroleum sector management has been examined and separation of functions in the institutional framework proved effective for the petroleum sector.⁶ Investment in the upstream petroleum operation is also affected

-
- ¹ Petrobangla 2015 Annual Report (Dhaka 2015) 7 <https://petrobangla.org.bd/admin/attachment/webtable/79_upload_0.pdf> accessed 19 June 2017
 - ² Reuters, Bangladesh Finds First Oil, in Two Gas Fields (20 May 2012) <<https://www.reuters.com/article/bangladesh-oil/bangladesh-finds-first-oil-in-two-gas-fields-idUSL4E8GK02M20120520>> accessed 3 May 2019
 - ³ AR Rasel, 'Bapex Discovers New Gas Field in Bhola' *The Daily Dhaka Tribune* (Dhaka 15 January 2018) <<https://www.dhakatribune.com/bangladesh/power-energy/2018/01/15/bapex-discovers-gas-bhola-2>> accessed 3 May 2019
 - ⁴ The emission of natural gas is lower compare to other fossil fuel such as oil and coal. *Natural Gas: Issues and Trends* (Washington DC: Energy Information Administration, 1998) Available at <https://www.eia.gov/naturalgas/archive/056098.pdf> Accessed 7 July 2019.
 - ⁵ Obadia Kyetuzza Bishoge et al., "The Overview of the Legal and Institutional Framework for Oil and Natural Gas Sector in Tanzania: A review", *Journal of Applied and Advanced Research*, 3 no.1 (2018): 8-17. See also Alexander Huurdeman and Anastasiya Rozhkova (Eds) *Balancing Petroleum Policy Toward Value, Sustainability, and Security*. (World Bank Group, 2019). Available at <https://openknowledge.worldbank.org/bitstream/handle/10986/31594/9781464813849.pdf> Accessed 3 May 2019.
 - ⁶ MC Thurber and others, 'Exporting the Norwegian Model: The Effect of Administrative Design on Oil Sector Performance,' *Energy Policy* 39,(2011): 5366-5378.

by the political-institutional framework.⁷ Though relevant research document is still very low, it is reported that poor infrastructure, unclear policies, sketchy regulation, corruption, poor governance, lack of funds and political commitment have hindered the progress of the gas sector in Bangladesh.⁸ This paper intends to provide the overview on the effectiveness and efficiency of the legal and institutional framework for the natural gas exploration in Bangladesh. The paper also analyses the effectiveness of the present legal, regulatory and policy frameworks in exploring the natural gas in a sustainable manner and makes some suggestions thereof.

The study is qualitative in nature and based on document analysis and some references of relevant countries are used to some appropriate extent. The materials from primary and secondary sources are used in this study. Relevant policy, laws and production sharing contracts are considered as the primary source of information and articles, books, annual reports of different government and non-government organisations, newspaper articles are the secondary sources of relevant information for this study.

2. Petroleum Sector : An over view

Exploration of petroleum⁹ resources in Bangladesh was started in the later part of the 19th century during the British rule in the then undivided Indian subcontinent. In that period the exploration activities were not in an organised form.¹⁰ The first drilling was taken place in Bangladesh region by Indian Prospecting Company in 1908 near the Sitakund, Chittagong and the first exploratory shallow well was drilled by the Burma Oil Company (BOC) in 1914. Both drillings gave no

⁷ Peter Toft and Arash Duero, 'Reliable in the Long Run? Petroleum Policy and Long-term Oil Supplier Reliability,' *Energy Policy* 39, (2011): 6587.

⁸ M Tamim, 'Policies and Priorities in Bangladesh Gas Sector Planning', *Energy for Sustainable Development* 7, (2003): 57-65

⁹ Society of Petroleum Engineers defined petroleum as a naturally occurring mixture of hydrocarbons which can be obtained in gaseous, liquid or solid form. See also <<https://www.spe.org/en/industry/terms-used-petroleum-reserves-resource-definitions/>> accessed 5 January 2017

¹⁰ Bernhard G. Gunter, *Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions Bangladesh* (Development Research Working Paper Series, Bangladesh Development Research Center, Dhaka 2008) 2-3

positive indication of oil existence.¹¹ BOC also drilled two more borings between 1923 to 1933 in Patharia and the sign of oil was found in one well but there was not any commercial production.¹² During the period from 1950 to 1971, the National Oil and Gas Development Corporation (NOGDC) of Pakistan and some International Oil Companies (IOC) conducted extensive exploration activities. This period is called the golden time for the petroleum exploration in Bangladesh as 8 gas fields were discovered after drilling 22 wells including offshore and onshore. Among these gas fields, 5 gas fields were discovered by IOCs and 2 fields by the then Pakistan Petroleum Ltd. and 1 by NOGDC.¹³ The first gas field was discovered in 1955 at Haripur and the second field was in 1959 at Chattak in Sylhet district.¹⁴

After the independence of Bangladesh, the exploration of petroleum was started with a new parameter both by the national and international oil companies. In the year 1975, Government purchased 5 gas fields from the international oil companies and established the sole national ownership of the national oil companies for the first time.¹⁵ It was a great decision of the Government to secure the energy sector of Bangladesh. Bangladesh has discovered 27 gas fields and 27th field was discovered at Bhola by Bangladesh Petroleum Exploration & Production Company Limited (BAPEX).¹⁶ According to the report of Petrobangla, total gas initially in place estimated was 39.8 TCF¹⁷ of

¹¹ MR Haque 'Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh' (MEngg. Thesis, Bangladesh University of Engineering and Technology 2000) p.16.

¹² Centre for Policy Dialogue 'Bangladesh Gas Sector Development: Status, Policy Options and Challenges' (Report) No. 24, May 2000, 150 <http://www.sdnbd.org/sdi/issues/natural_gas/report/Bb%20Gas%20Sector%20Dev%20Status%20Policy%20Options%20&%20Challenges.PDF> accessed 9 April 2019

¹³ Haque (n 3) 16

¹⁴ Petrobangla 2018 Annual Report (Dhaka 2004) 5 <<https://petrobangla.org.bd/?params=en/annualreport>> accessed 4 August 2019.

¹⁵ Petrobangla 2017 Annual Report (Dhaka 2004) 17 <<https://petrobangla.org.bd/?params=en/annualreport>> accessed 8 January 2019

¹⁶ AR Rasel, 'Bapex Discovers New Gas Field in Bhola' *The Daily Dhaka Tribune* (Dhaka 15 January 2018) <<https://www.dhakatribune.com/bangladesh/power-energy/2018/01/15/bapex-discovers-gas-bhola-2>> accessed 3 May 2019

¹⁷ Trillion cubic feet

which estimated total recoverable gas reserve is 27.81 TCF. Up to December 2018, the gas reserve is 11.47 TCF. Out of 27 gas fields 21 gas fields are under production, production suspended in 4 fields and 2 fields are yet to produce, these are the Kutubdia and Bhola.¹⁸ Despite the increase rate of production to meet the rising demand of the different sectors, the gap between the supply and demand is widening day by day. During December 2016, the daily production of gas was 2700 MMSCFD¹⁹. Now, Bangladesh produces 2.7 billion cft while the demand is 3.4 billion cft. The government has a legal and institutional framework consisting of plan, policy and laws to increase gas production sustainably as discussed hereunder.

2.1 Legal and Institutional Frameworks

A legal framework or legal architecture for any natural resource extraction project is defined as a set of instruments that include the Constitution, legislation, regulations and contracts in which rights and responsibilities of governments, companies, and citizens are defined.²⁰ The relation among different instruments in a legal framework is shown in Figure 1.

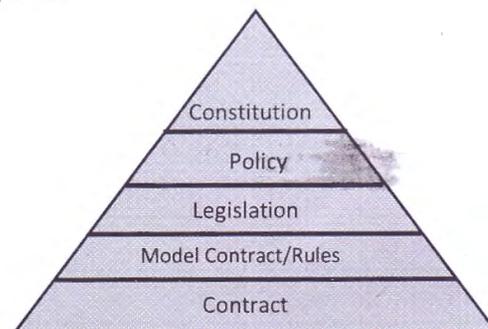


Figure 1. | Hierarchy in a Legal Framework

¹⁸ Petrobangla (n 6) 18

¹⁹ Million standard cubic feet

²⁰ Natural Resource Governance Institute, Legal Framework, Navigating the Web of Laws and Contracts Governing Extractive Industries (NRGI) <https://resourcegovernance.org/sites/default/files/nrgi_Legal-Framework.pdf> accessed 4 August 2019

The legal framework comprises Constitution of the country and the relevant policies, laws, regulations and agreements.²¹ The Constitution is at the bottom of the hierarchy of a legal framework upon which the relevant policies are formulated. Policy comprises a course of action to guide the decisions, actions and legislative process of a government.²² Actually, the policies lead to enactment of new legislation to achieve the goals determined by the policy.²³ Legislation is the binding set of rules to govern the vision set through the policy.²⁴ The rules, regulations and model contracts are made on the guidance of the policy and legislation. Finally, contracts are made on the basis of the model contract.²⁵ The legislation, which is adopted based on the policy, implemented through the legal institution established for the very purpose.

3. Legal Framework for Natural Gas Operation in Bangladesh

The legal framework comprises both the laws and policies to develop the petroleum resources and a number of relevant laws and policy enacted in time to time. Legal framework for the extraction of petroleum resource plays a vital role as it creates a competitive environment for the oil companies as well as facilitates the host country achieving national policy objectives.²⁶ Before the beginning of the exploration activities, the petroleum resources were governed by the Petroleum Act 1899, which was repealed by the Petroleum Act

²¹ Natural Resource Governance Institute (NRGI), Legal Framework, Navigating the Web of Laws and Contracts Governing Extractive Industries < https://resourcegovernance.org/sites/default/files/nrgi_Legal-Framework.pdf> accessed 4 August 2019

²² Cited in Tina Hunter 'Legal Regulatory Framework for the Sustainable Extraction of Australian Offshore Petroleum Resources: A Critical Functional Analysis' (PhD dissertation, University of Bergen, 2010) 136

²³ Difference Between Law and Policy <<http://www.differencebetween.net/miscellaneous/politics/difference-between-law-and-policy/>> accessed 3 August 2019

²⁴ NRGI (n 25)

²⁵ *ibid*

²⁶ T Hunter, 'Sustainable Socio-economic Extraction of Australian Offshore Petroleum Resources through Legal Regulation: Is It Possible?' (2011) 29 *Journal of Energy & Natural Resources Law* 209- 227.

1934.²⁷ Though the first exploration of petroleum was started in 1908²⁸ the Petroleum Act 1934, in this regard was enacted in 1934. Thereafter a number of laws and rules are adopted and repealed with the changing circumstances. At present the extraction of natural gas in Bangladesh is governed through the following Constitutional and legislative framework.

3.1 Constitution of the People's Republic of Bangladesh

The Constitution of Bangladesh does not explicitly provide any provision regarding the operation and management of petroleum resources of the country. However, there are some articles which are directly and indirectly related with the petroleum activities. Article 143 of the Constitution vested the ownership of all minerals and any valuable things underlying the land and ocean within the territorial sea and continental shelf of Bangladesh on the republic.²⁹ Article 13 states that the people shall own and control the instruments and means of production and distribution and to this end, three types of ownership is recognized by the Constitution, state ownership is one of them. State ownership refers to the ownership on behalf of the people by creating efficient and dynamic nationalised public sector embracing the key sector of the economy.³⁰ To this effect, Bangladesh ensures ownership of the state on all mineral resources including petroleum. As an owner of petroleum resources, the responsibility to conduct the operations for and on behalf of the people lies on the state. The supremacy of the Constitution is guaranteed by article 7(ii) of the Constitution and the government is bound to conduct its activities according to and within the Constitution. Article 18 (a) of the Constitution of Bangladesh imposes responsibility on the government to endeavor to protect and improve the environment and to preserve and install safeguards for the natural resources, biodiversity, wetlands, forest and wild life for the present and future generation. Article 18(a) was not in the Constitution from the very beginning and inserted in 2011 to address

²⁷ The Petroleum Rules 1937 s 2.

²⁸ Haque (n 3) 16.

²⁹ The Constitution of The People's Republic of Bangladesh, art 143.

³⁰ The Constitution of The People's Republic of Bangladesh, art 13.

the present demand of the sustainable development concept. The term 'preserve and safeguard of natural resources' and 'for the present and future generation' denote the sustainable development of the petroleum resources as well as the natural gas. The article impliedly expressed the state's responsibility to ensure the sustainable development of natural gas. Article 23 expresses the obligation of the state to take steps to protect and develop the unique local culture and tradition of the tribes, minor races, ethnic sects and communities.³¹ There are some implied duties on the government to take all the necessary steps aimed at protecting the right of those vulnerable people who are subjected to the adverse impact of the petroleum operation and it imposes the liability of the government, before or during the petroleum operations to consult with the affected communities to protect their culture, language and lifestyle. Consultation with the concerned community regarding the petroleum project may serve a meaningful purpose to attain sustainable development of this resource such as Mexico adopted the method of community consultation as an obligation of the concerned ministry before conducting any petroleum operation.³²

3.2 Policy Framework for Petroleum Activities in Bangladesh

Clear policy with specific objectives is one of the fundamental requirements for the development of the petroleum resources.³³ A comprehensive policy framework is essential to provide strategic direction for sustainable exploration and production of petroleum.³⁴ A successful and adaptive policy is required, to accelerate strength of the private companies to exploit petroleum, though in formulating the policy the national government may be influenced by the political,

³¹ The Constitution of The People's Republic of Bangladesh art 23(a)

³² Social Sustainability in Oil and Gas Projects, file:///G:/3rd%20chapter/Social%20sustainability%20in%20oil%20and%20gas%20projects%20%E2%80%93%20EY%20Law.html accessed on September 25 2019

³³ A Short Guide to Parliamentary Oversight of The Oil and Gas Sector for Parliament of Ghana, Section One Good Governance of the Oil and Gas Sector - a Primer for Ghanaian Members of Parliament Good Governance of the National Petroleum Sector Project, Chatham House 2006.

³⁴ Ministry of Natural Resources, Republic of Rwanda 'National Upstream Petroleum Policy for Rwanda' (Report) 2013, 5

social and economic forces of the companies.³⁵ Without sound policy, the resource management become uncontrolled and ultimately benefit of the citizen could not be ensured.³⁶ As policy mechanism, Bangladesh has adopted The Petroleum Policy 1993 and the Gas Sector Master Plan 2017.

3.2.1 Petroleum Policy 1993

The only independent petroleum policy of Bangladesh was formulated in 1993 with 10 basic objectives.³⁷ The Government of Bangladesh formulated this policy to attract the national and foreign companies specially the private investors in this vital sector, to meet the rising demand of energy.³⁸ Some of the significant aspects of this policy were to ensure the sustainable development of the country through the systematic survey, exploration and exploitation of the petroleum resources.³⁹ To attract the foreign investment unique policy instrument was introduced for both local and foreign oil companies with a view to accelerating the exploration activities. As a direct consequence of this policy, four production sharing contracts were signed with the multinational companies for the exploration of the natural gas or petroleum in Bangladesh.⁴⁰ In order to increase the involvement of multinational oil companies, measurement of Environmental Impact Assessment (EIA) was also promoted in this policy. Through the policy the joint venture exploration activities were allowed for the national exploration companies with the foreign one.⁴¹ The policy also specifies about the amendment of existing rules and legislation if necessary to achieve its goals, however no amendment of the Petroleum Act was made to cope with the changing circumstances.

³⁵ T Hunter, 'It's time: Petroleum Policy Change for Sustainable Development in the Australian Offshore Upstream Petroleum Sector' <http://epublications.bond.edu.au/law_pubs/313> accessed 15 February 2017

³⁶ *ibid*

³⁷ National Energy Policy 2004, Ministry of Power, Energy and Mineral Resources, Government of The People's Republic of Bangladesh

³⁸ The Petroleum Policy 1993

³⁹ *ibid*

⁴⁰ M Tamim, 'Policies and Priorities in Bangladesh Gas Sector Planning,' *Energy for Sustainable Development* (2003) 2, 57-65

⁴¹ n 32

A long time has been elapsed after issuing the Petroleum Policy in 1993; however, no independent petroleum policy is formulated thereafter though the energy policy of Bangladesh is revised in a regular interval and the petroleum is the part of energy but no separate policy like the Petroleum policy 1993 has been adopted. On the other hand, the Government of India issues petroleum policies on a regular basis. India adopted New Exploration Licensing Policy in 1997, the Integrated Energy Policy in 2008, and Hydrocarbon Exploration Licensing Policy in 2017 to accommodate the country's needs and developments and to attract international investors.⁴²

3.2.2 National Energy Policy 2004

The National Energy Policy (NEP) 1995 was adopted in 1995 and revised in 2004. The petroleum policy of 1993 was merged with the NEP 1995 and was a part of this policy. The background of this policy stated "the Government of Bangladesh has given continuing attention to the overall development of energy sector. It involved survey, exploration, exploitation and distribution of indigenous natural gas..." that indicates the purpose of this policy was to ensure the development of energy sector including natural gas. The NEP outlined 10 objectives of which five are directly and/or indirectly related with the sustainable development of natural gas.⁴³ There is a strong provision regarding environment, which suggests that in all phases of the operation of any fuel's full life cycle including exploration, appraisal, extraction, conversion, transportation and consumption environmental issues have to be considered.⁴⁴ To this end, the EIA including social impact assessment have to be mandatory to initiate any new energy project⁴⁵ and utilization of cost effective environment friendly technology is encouraged.⁴⁶ It also recommended to consider environmental issues according to the provision of National Energy Policy and

⁴² Ramboll, 'Gas Sector Master Plan Bangladesh 2017' (Report) 28 February 2018, 235

⁴³ Paragraph 1.2 (iii)-(vii) of National Energy Policy, Ministry of Power, Energy and Mineral Resources Government of The People's Republic of Bangladesh, 2004.

⁴⁴ Paragraph 6.9 (n 39).

⁴⁵ Paragraph 7.1.9 (n 39).

⁴⁶ Paragraph 7.1.9 (n 39).

environmental Act.⁴⁷ Formation of strong energy advisory council is recommended which constituted by the representatives of politician, policy makers, professionals and expert in this sector.⁴⁸ The national exploration company BAPEX should be modernised for assessing non renewable resources and intensive exploration in unexplored and virgin areas.⁴⁹ Enactment of new law and energy audit cell is also proposed by this policy.⁵⁰

The energy policy includes a petroleum policy with the above guidelines for the development of energy sector of Bangladesh. The objectives of this petroleum policy is to ensure the systematic survey, exploration and exploitation of the petroleum resources for sustainable development of the country, adoption of uniform policy both for private and public enterprises, accelerate the exploration and development of indigenous petroleum resources, development of gas field through private sector and strengthen the administrative, technical and research capabilities of the government representatives who are responsible to make policy and its implementation.⁵¹ The objectives also include the promotion of EIA of this sector. To attain these objectives it recommended the amendment of the existing laws and rules relating to petroleum sector, stipulate the time limit to decide exploration and disputed applications, amendment of confidentiality rules and revision of MPSC on a regular basis.⁵² Mandate also imposed on companies to ensure maximum recovery by optimal development of oil and gas field.⁵³ For the protection of environment and ensuring the safety, the policy also suggests to formulate three new rules along with the implementation of existing laws and rules relating to environment. Among the suggested new rules one is regarding Oil and Gas Exploration Safety Rules.⁵⁴ Moreover, to accelerate the production the policy also proposed to develop the marginal or abandoned gas field.

⁴⁷ Paragraph 6.20 (n 39).

⁴⁸ Paragraph 6.22 (n 39).

⁴⁹ Paragraph 7.1.1 (n 39).

⁵⁰ Paragraph 7.17 and 7.18 (n 39).

⁵¹ Paragraph 7.2.1 (n 39).

⁵² Paragraph 7.2.2(A) (n 39).

⁵³ Paragraph 7.2.2(C)(iv) (n 39).

⁵⁴ Paragraph 7.2.9 (n 39).

NEP 2004 suggested a number of reformations of the existing legal, institutional and policy frameworks to make a sustainable energy sector in Bangladesh however; implementation of these suggestions is not yet reflected. After the adoption of NEP 2004, Model PSC was revised in 2008, 2012 and 2019. Despite the recommendation of the energy policy no change is noticed in the confidentiality clause of the PSCs. Though the policy did not directly specify about the benefit of the future generation it proposed Energy Conservation Act which actually reflects the interest of the future generation. However, such Act is yet to enact. The concept of sustainable development of petroleum resources was not incorporated in such way before formulating the Energy Policy in 2004. Some of the suggestions are implemented as the MPSC is revised on a regular basis, provision of administering fee is also abolished from the PSC and some new law is enacted addressing the downstream activities of petroleum resources but no new law is enacted to enhance the exploration and production of natural gas in Bangladesh as it is the prime source of commercial energy supply.

3.2.3 Gas Sector Master Plan 2017 (GSMP 2017)

The gas sector master plan depicts an overall picture of the demand, supply, shortages and role of legal and regulatory framework of the natural gas sector in Bangladesh. GSMP 2017 also provides a forecast up to 2041. To meet the increasing demand of gas supply the master plan represents that to accelerate the exploration and production of gas, the capacity building of Petrobangla personnel's and its subsidiaries is inevitable which requires the prudent managerial and a large amount of financial support.⁵⁵ Updating the legal and regulatory framework of the upstream sector is emphasized with a view to increasing the exploration and production of indigenous natural gas.⁵⁶ GSMP 2017 also outlines an action plan highlighting two matters in upstream sector to ensure the overall development of the gas sector. These are the establishment of an independent upstream legal regulator and regulator to manage bidding rounds and granting PSCs.⁵⁷

⁵⁵ Ramboll (n 38) 3.

⁵⁶ Ramboll (n 38) 22.

⁵⁷ Ramboll (n 36) 22-23

3.3 The Bangladesh Petroleum Act 1974

The upstream petroleum operation in Bangladesh is mainly governed by this Act. In the year 1973, a comprehensive policy was suggested to introduce a new regulatory framework with a view to accelerating the rapid exploration and production to protect the interest of the nation.⁵⁸ This Act was the direct output of that recommendation. In this Act, some guidelines were incorporated to foster the exploration and production activities of petroleum resources for the first time in the history of Bangladesh. In its very beginning, it is stated that the Bangladesh Petroleum Act is

...an expedient to provide for the exploration, development, exploitation, production, processing, refining and marketing of petroleum.

One of the significant aspects of the Act is that it incorporated the doctrine of "permanent sovereignty over natural resources" which was affirmed by the United Nations General Assembly in 1962⁵⁹ and reaffirmed in a more comprehensive form in 1966.⁶⁰ Section 3(1) of this Act provides

*The Government shall have, within the territory, continental shelf and economic zone of Bangladesh, exclusive right to explore, develop, exploit, produce, process, refine and market petroleum.*⁶¹

Bangladesh has recognised its sovereignty over natural resources by the Constitution and also through this Act. Not only Bangladesh but many countries of the world also incorporated this right in the Constitution such as Indonesia. In 1945, Indonesia recognised state's sovereign rights over natural resources found both in the land and

⁵⁸ Haque (n 3) 1

⁵⁹ <<http://Cil.Nus.Edu.Sg/Rp/Il/Pdf/1962%20General%20Assembly%20Resolution%20On%20Permanent%20Sovereignty%20Over%20Natural%20Resources-Pdf.Pdf>> accessed 12 June 2019

⁶⁰ United Nations Yearbook, 1966. <<http://Untreaty.Un.Org/Cod/Unjuridicalyearbook/Pdfs/English/Byvolume/1966/Chpiii.Pdf>> accessed 12 June 2019

⁶¹ The Bangladesh Petroleum Act 1974 s 3(1)

under the water by article 33 of their Constitution.⁶² The ownership of petroleum resources may vary from country to country. In some countries the ownership of petroleum is vested on the state, in some countries it is vested on the individuals *i.e.* the resource belongs to the owner of the land and in some countries it is vested on the people of the state with some restrictions not delegating the right of exploration and production to any private person.⁶³ However, section 3 of the Petroleum Act 1974 also provides the right of the Government to explore, produce, develop, transmit and distribute of the petroleum resources.

Bangladesh Petroleum Act was enacted in 1974 just after the Stockholm Declaration so some provisions were included to address the environmental issues *i.e.* section 6 states that *it shall be the duty of any person engaged in any petroleum operation*

(a) *to ensure that such petroleum operation is carried on in a proper and workmanlike manner and in accordance with good oil-field practice;*

(b) *to carry on petroleum operation in any area in a manner that does not interfere with navigation, fishing, and conservation of resources of the sea and sea-bed;*

(c) *to consider factors connected with the ecology and environment.*⁶⁴

Provisions are also made as to the protection of the area on the petroleum operation such as

(a) *control the flow, and prevent the waste or escape, in that area of petroleum or water;*

(b) *prevent the escape in that area of any mixture of water or drilling fluid with petroleum or any other matter;*

(c) *prevent damage to petroleum bearing strata in any area, whether adjacent to that area or not*

(d) *prevent water or any other matter entering a petroleum pool through wells in that area, except when required by, and in accordance with, good oil-field practice.*⁶⁵

⁶² AV Kaundu, 'Analysis of the Legal Framework for State Participation in the Petroleum Industry: A Case of Namibia' (LLM Thesis) 18.

⁶³ Kaundu (n 46) 5

⁶⁴ The Bangladesh Petroleum Act 1974 s 6(1)

No clear guideline is provided in which manner the Bangladesh Oil, Gas and Mineral Corporation (Petrobangla) will discharge those duties and ensures the compliance of the national and international oil companies with the above obligation outlined by this Act. Section 11 mentions the rule making power of the government but till now no rule is made under this Act specifying detailed upstream petroleum operation and wide discretionary power is delegated to Petrobangla.

Here the responsibility lies on the oil companies engaged in the operation to conduct the petroleum operation in an eco-friendly manner without prejudice to the environment and ecology. Though several rights of the country to extract the petroleum resources are guaranteed by section 3, no liability to protect the environment and ecology is imposed on the government. In fact, inclusion of above provisions, were the reflection of the Stockholm Declaration without any compliance mechanism. It overlooked some of the crucial points such as there is no provision of sustainable extraction to ensure the long-term development. Effective management of the petroleum resources depends on how the industry regulation, direct indigenous participation and utilization of petroleum revenues work in their relevant fields.⁶⁵The Act mentioned to perform the work in a good oil field manner that varies from company to company. In this regard, the national law should outline the rights and responsibilities of the companies engaged in the petroleum operation. As the companies conduct their operation in a country are under an obligation to comply with the law of the land.

In this case the Mines and Mineral Rules 2012 can be considered which is formulated under the Mines and Mineral Resources (Control and Development) Act 1992. This Act is not applicable to petroleum resources as petroleum is governed by the petroleum Act 1974. However, it is mentionable that a detailed Rule is framed to govern the extraction of other mineral resources which comprises a number of provisions to ensure the sustainable extraction. Such as the provision of

⁶⁵ s 6(2) (n 48)

⁶⁶ P Subai, 'Towards A Functional Petroleum Industry in Nigeria: A Critical Analysis of Nigeria's Petroleum Industry Reform' (PhD Dissertation, Newcastle University 2014)

compensation by the licence holder is included where the operator is responsible for any destruction. It ensures the payment of compensation for any damage that is held by the operator according to Bangladesh Environment Conservation Act 1995.⁶⁷ It also inserted a separate provision for the protection of environment which impose obligation on the operator to conduct the operation according to existing environmental laws of Bangladesh. Operator is required to plant trees and fill up the boreholes and if it impossible to fill up then to convert it in area of fisheries.⁶⁸ If any damage occurred to mineral resources due to negligence, lack of supervision or to carry out the operation in an unscientific manner the license holder or lease holder is responsible to pay compensation for the damage or loss.⁶⁹ Extraction of other mineral resources is governed in a well defined way where the obligations of the operator for conducting the mining operation, is explicitly described by formulating a rule which is absent in natural gas sector.

3.4 The Bangladesh Oil, Gas and Mineral Corporation Ordinance, 1985

The Bangladesh Oil Gas and Mineral Corporation *i.e.* Petrobangla⁷⁰ was established under this ordinance. Before the establishment of Petrobangla, the Bangladesh Mineral Exploration and Development Corporation established under the Bangladesh Mineral Exploration and Development Corporation Order, 1972 and Bangladesh Oil and Gas Corporation established under the Bangladesh Industrial Enterprises (Nationalisation) Order, 1972.⁷¹ Before 1985 there were two organisations one is for mineral resources and the other is for oil and

⁶⁷ Article 18 of The Mines and Minerals Rules 2012, Energy and Mineral Division, Ministry of Power, Energy and Mineral Resources, The People's Republic of Bangladesh.

⁶⁸ Article 42 and 56 of The Mines And Minerals Rules 2012, Energy and Mineral Division, Ministry of Power, Energy and Mineral Resources, The People's Republic of Bangladesh

⁶⁹ Article 26 of The Mines And Minerals Rules 2012, Energy and Mineral Division, Ministry of Power, Energy and Mineral Resources, The People's Republic of Bangladesh

⁷⁰ The Bangladesh Oil, Gas and Mineral Corporation Ordinance, 1985 s 2

⁷¹ s 24 (c) (n 51)

gas that means petroleum resources. Both of the organisations were merged and Petrobangla was established in 1985 and is responsible for the development of mineral as well as petroleum resources. According to this Act, the board of directors are highly empowered as all the affairs and business of the corporation are vested on them.⁷² The functions of the Petrobangla are clearly defined by this act as it state that

- (1) *The functions of the Corporation shall be-*
- (a) *to undertake research in the field of oil, gas and minerals;*
 - (b) *to prepare and implement programmes for the exploration and development of oil, gas and mineral resources;*
 - (c) *to produce and sell oil, gas and mineral resources; ...*
- (2) *Without prejudice to the generality of the foregoing provisions, the Corporation shall, in particular, have power-*
- (b) *to carry out geological, geophysical and other surveys for the exploration and development of oil, gas and mineral resources;*
 - (c) *to carry out drilling and other prospecting operations to prove and estimate the reserves of oil, gas and mineral resources and collect all data required for adopting the most suitable extraction and mining method;*

All the responsibilities of explore, produce and develop petroleum resources lies on Petrobangla. The governance of the petroleum sector of Bangladesh is also conferred on the Petrobangla. On the other hand, some of the indicators of good governance in petroleum sector are not included in this ordinance. Provision of accountability in decision making and performance⁷³ as well as transparency⁷⁴ of the Petrobangla is not defined. However, in that time the concept of sustainable development was in a developing stage this ordinance did not possess any provision to ensure the benefit of the future generation.⁷⁵

⁷² s 5 (n 51)

⁷³ National Petroleum Sector Project *A Short Guide to Parliamentary Oversight of the Oil and Gas Sector for Parliament Of Ghana* (Chatham House 2006) 3-8

⁷⁴ *ibid*

⁷⁵ *ibid*

3.5 The Speedy Supply of Power and Energy (Special Provision) Act 2010

Bangladesh is facing an acute power and energy crisis since 2006.⁷⁶ This law was enacted in 2010 to resolve the crisis within a short time and for quick disposal of contracts of power and energy sector for a period of two years.⁷⁷ Provisions of this Act are in controversy as well as compatibility with the concept of sustainable development is questionable. The Government formed a special committee named proposal processing committee comprised by the person experienced in technical and on other issues related with the proposal.⁷⁸ This committee is formed by top government officials of MoPEM⁷⁹ and officials of national power and energy entities.⁸⁰ This Act empowered the committee to conclude a contract by putting out short time newspaper notices, online advertisements even carrying on negotiations through email or letter. One of the non-transparent provision of this Act is the circulation of tender is also allowed even by private communication through email or letter with the concerned organisation⁸¹ and empowered the special committee, to contract through private negotiation. Prior to submission of the proposal before the cabinet, the committee authorised to take any decision regarding the proposal and when the proposal submitted before the cabinet and Financial and Government Purchase Committee of the cabinet approved the proposal, the administrative division, shall respond appropriately to implement the proposal. The validity of any act done under this Act or act deemed to be taken, under this Act shall not be questioned before any court of law.⁸² No civil or criminal suit can be filed against any

⁷⁶ Bangladesh Cabinet approves 4-year extension of special law for energy, power projects, S & P global plats, 27 Aug 2014, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/082714-bangladesh-cabinet-approves-4-year-extension-of-special-law-for-energy-power-projects> accessed 10 August 2020.

⁷⁷ Section 1(2) of the Power and Energy Speedy Transmission Enhancement (Special Provision) Act 2010 (translated by the researcher)

⁷⁸ Section 5 (n 77).

⁷⁹ Ministry of Power, Energy, and Mineral Resources, Peoples Republic of Bangladesh.

⁸⁰ n 76.

⁸¹ Section 6(d) (n 77).

⁸² Section 9 (n 77).

officer for any act done in good faith under this Act or deemed to be done under this Act.⁸³ The acts and proceedings taken under this Act shall be continued in a manner as the Act is in operation even after the duration has been expired.

This Act is known as the indemnity Act to protect officials in the power and energy sector involved in signing contract without any tender.⁸⁴ Energy expert also expressed their deep concern that “the law would act as a shield to protect the corrupt officials and policymakers”.⁸⁵ After expiration of two years, it was extended for another two years in September 2012, it was further extended for 4 years in August 2014 and finally it was extended for third time up to 2021. Experts of local energy industry expressed their concern on extension as it could encourage corruption and non transparency in energy and power sector.⁸⁶ Following the Act, Petrobangla engaged with Russian company Gazprom for drilling 10 gas production well in different fields cost BDT 1600 crores.⁸⁷ The Act may pave the way of corruption by bypassing tendering process⁸⁸ and is considered as the violation of the Constitution as the unfettered power conferred by this Act is being used against public interest.⁸⁹ There is also urging to revoke the Act, as it may lead inefficiency of power sector.⁹⁰

It is shown, that the policy, laws, regulation and institution of the petroleum sector is not sufficient to ensure the sustainable development of these resources. Enactment of special Act(s) is a matter

⁸³ Section 10 (n 77).

⁸⁴ Speedy Supply of Power and Energy Act, 4 years extension, energy bangla, July 21, 2014. <https://energybangla.com/speedy-supply-power-energy-act-4-years-extension/> accessed 10 August 2020.

⁸⁵ *ibid*

⁸⁶ Bangladesh Cabinet approves 4-year extension of special law for energy, power projects, S & P global plats, 27 Aug 2014, <https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/082714-bangladesh-cabinet-approves-4-year-extension-of-special-law-for-energy-power-projects> accessed 10 August 2020.

⁸⁷ n 84 and n 86

⁸⁸ n 86

⁸⁹ Thrust on scrapping unConstitutional speedy energy supply law, The Business Standard, 10 July, 2020, pmsnews.net/bangladesh/energy/thrust-scrapping-unConstitutional-speedy-energy-supply-law-104563 accessed 10 August 2020.

⁹⁰ *ibid*.

of great concern for proper management of this valuable sector and effectiveness of other laws and regulation becomes volatile.

3.6. Contractual Framework

Due to the lack of experts and technical support as well as financial capability, to some extent the petroleum producing countries have to seek the assistance of the IOCs throughout the world.⁹¹ In this case, they entered into a contract with the petroleum producing companies whether it is national or international. There are mainly three types of agreements or contracts between the state and oil producing countries. These are the concession, production sharing contract and service contract. In addition to these three types of contracts another two types of agreement or contract also found which are derived from the main three categories that are the joint venture and hybrid system.⁹² Bangladesh now follows the production sharing contract to carry on its exploration and production.

3.6.1 Production Sharing Contract (PSC)

Production Sharing Contract is essentially a process to involve the national or international private organisation in the upstream activities of the petroleum resources.⁹³ Indonesia is the pioneer of the production sharing contract in the world though it was introduced in 1966 in the agricultural sector to share the agricultural crops.⁹⁴ The emergence of Doctrine of permanent sovereignty over natural resources introduced the modification of the traditional concession system and the production sharing contract or agreement appear as a new way to make agreement with the oil producing companies.⁹⁵ In this contract,

⁹¹ Mailula (n 16) 74

⁹² A Al Faruque, *Petroleum Contract: Stability and Risk Management in Developing Countries* (Bangladesh Institute of Law and International Affairs, Dhaka 2011) 8

⁹³ AWahid & N Rawshan, 'Exploration Activities in Bangladesh Gas' (2004) 1 *BRAC University Journal* 33-40

⁹⁴ Gustavson Associates, 'Monitoring and Supervision Procedures for Exploration and Development Activities' (Report) ,Hydrocarbon Unit, Energy and Mineral Resources Division, Government of the People's Republic of Bangladesh, 6 May 2011, 10

⁹⁵ Faruque (n 67)

three elements, e.g. the cost recovery, profit oil or gas and tax, are very essential. As in a PSC, the produced petroleum is divided as a part of cost recovery and profit. After that the profit petroleum will be shared between the host government and the operating company. All the risk and the cost are borne by the operating companies and the cost is only recoverable after the production. In this case, the payment is made to the resources owner (host government) after the successful production.⁹⁶

At present PSC is the most familiar petroleum agreement among the developing countries but there is no any uniform model of it.⁹⁷ PSC is popular throughout the world especially in developing countries because petroleum operation is highly risky and there are average 9 out of 10 exploration is unsuccessful and the operating companies recover their cost only after a successful production with full control and management of the host country.⁹⁸

3.6.2 Models Production Sharing Contract (MPSC) of Bangladesh

Bangladesh inherited the concession system from Pakistan after the independence in 1971.⁹⁹ After the independence, the government of Bangladesh and Petrobangla negotiate with the IOCs for the exploration and production of the natural gas. In that case, Petrobangla enjoyed wide discretionary authority to negotiate without any specific guidelines.¹⁰⁰ The first MPSC of Bangladesh was adopted in 1988 which framed contractual provisions and set guidelines for Petrobangla. Thereafter the MPSCs are revised in 1997, 2008, 2012 and lastly in 2019 separate MPSC have been formulated for onshore and offshore petroleum operation.

⁹⁶ Production Sharing Agreements: Theory and Practical Applications, Kazakhstan International Business Magazine (2003) <www.investkz.com> accessed 10 February 2017

⁹⁷ B Taverne *An Introduction to the Regulation of the Petroleum Industry: Laws, Contracts and Conventions* (Kluwer Law International, 1994) 63

⁹⁸ Kiluange Tiny, *The JDZ Model PSC: A Legal Analysis*, *JuriSTEP*, August 2005 .

⁹⁹ Gustavson Associates (n 69)10

¹⁰⁰ The World Bank (Performance Audit Report), People's Republic of Bangladesh Petroleum Exploration Promotion Project(CREDIT 1402-BD)30 June 1993.

In a production sharing contract of Bangladesh, there are three parties the Government, Petrobangla and the contractor. Paragraph 3 of the preamble of MPSC 2008 clearly states that all the power of the government will be exercised by Petrobangla and in all cases the interest of the People's Republic of Bangladesh will be the ultimate goal.¹⁰¹ The MPSC provides a very significant definition of the petroleum operation. "Petroleum Operations" means the Exploration, the Appraisal, the Development, the Production and Abandonment related operations along with other activities including environmental considerations and Environmental Management Plan related to those operations carried out under this Contract.¹⁰² Though the environmental consideration is one of the important ingredients of the petroleum operation but there was no specific provision in the MPSC regarding this issue before 2012. Moreover, there is a relation between the accident in petroleum operation and the lack of sustainable practice.¹⁰³ Despite a number of blowouts during petroleum history of Bangladesh, no special provision is added in the revised MPSC to prevent accidents.

4. Institutional Framework

It is necessary for any country to develop an institutional framework for successful petroleum exploitation in a sustainable manner. Petrobangla is the primary institution serving the petroleum and mining activities in the country.

4.1 Bangladesh Oil, Gas and Mineral Corporation (Petrobangla)

Bangladesh Mineral, Oil and Natural Gas Corporation (BMOGC), was established in 1972 by the presidential order number 27.¹⁰⁴ The operational activities of the corporation were separated in the same

¹⁰¹ Model Product Shearing Contract 2008 3

¹⁰² MPSC 2008 art 1.65

¹⁰³ 'Piper Alpha Disaster: How 167 Oil Rig Workers Died' *The Guardian* (London 2013) <<https://www.theguardian.com/business/2013/jul/04/piper-alpha-disaster-167-oil-rig>> accessed 26 July 2017).

¹⁰⁴ Bangladesh Oil Gas and Mineral Corporation , BD Yellow Pages, Online Business Directory <<http://bdyellowpages.net/description/BangladeshOilandGasMineralCorporation>> accessed 6 May 2018

year by the presidential order number 120 and vested to new organization named as Bangladesh Mineral Development Corporation (BMEDC).¹⁰⁵ Then it was reconstituted as Bangladesh Oil and Gas Corporation (BOGC) through the ordinance number 15 of 1974.¹⁰⁶ In 1985, the BMEDC and BOGC were merged into a single entity as Bangladesh Oil, Gas and Mineral Corporation (BOGMC).¹⁰⁷ The natural gas is under the heading of the energy and mineral resources division of MoPEMR which is vested on Bangladesh Oil, Gas and Mineral Corporation. The management and the development of natural gas are under this organization. Petrobangla conducts its activities with some affiliated companies of which three companies are responsible for exploration and production, one for transmission, six for distribution and one for CNG promotion.¹⁰⁸ The upstream activities of natural gas in Bangladesh are conducted through three national companies under Petrobangla, these are Bangladesh Petroleum Exploration and Production Company Limited (BAPEX), Bangladesh Gas Fields Company Limited (BGFCL) and Sylhet Gas Fields Limited (SGFL).¹⁰⁹ Among these three companies BAPEX is empowered for both the exploration and production and other two companies BGFCL and SGFL are responsible only for production.¹¹⁰

At present maximum gas fields are operated by Petrobangla's affiliated companies which are responsible for the development of natural gas and oil in Bangladesh. There is no separation of power as the commercial purpose also served by the same organisation that is Petrobangla which functions as a regulator. The fusion of regulatory and commercial function and their delegation to the same entity is one of the significant barriers to proper development of the petroleum

¹⁰⁵ Petrobangla <https://www.mpemr.gov.bd/public_service/details/4> accessed 6 May 2018

¹⁰⁶ A Study on 'Accounting Systems of Petrobangla' < <https://lawaspect.com/study-accounting-systems-petrobangla/>> accessed 11 December 2018

¹⁰⁷ *ibid*

¹⁰⁸ Ministry of Power, Energy and Mineral Resources, The People's Republic of Bangladesh 'Data Collection Survey on Bangladesh Natural Gas Sector' (Report) 2012, 8

¹⁰⁹ Petrobangla (n 7) 39

¹¹⁰ *ibid*

resources.¹¹¹ The NOCs are partners as well as competitors to the IOCs when the NOCS are working with the IOCs.¹¹² In case of Bangladesh, Petrobangla negotiates with the IOCs and the same time carry on their upstream and downstream activities through their affiliated companies sometimes in cooperation with the IOCs. Whereas in Norway, which is considered as a model country of petroleum exploitation in the world, ensures the separation of functions among the policy development, industry regulation and commercial operation. In this country, the administration of petroleum are imposed on three different bodies these are a National Oil Company that is engaged in commercial petroleum production, the responsibility of policy development lies on the Ministry of Petroleum and Energy and the Norwegian Petroleum Directorate is working as a regulatory body.¹¹³ On the contrary, the same body that is Petrobangla which is working as a regulatory organization and at the same time performs the exploration and production activities through some affiliated companies. As the authority to control the petroleum operation is gathered to a single hand Petrobangla, there is a high susceptibility of collusion which is noticed in most of the developing countries.¹¹⁴ Lack of accountability of Petrobangla, which is considered as one of the ingredient of sustainable development, leads some mismanagement in this organisation, such as collusion between the international oil company and the public official, corruption or bribery and lack of efficiency in different level.¹¹⁵ The state owned organisation is also present in many other developing countries like Vietnam the Petrovietnam (Vietnam oil and gas corporation) played the same role as Petrobangla of Bangladesh.¹¹⁶ This system of self-regulatory institution may be beneficial in the early stages of petroleum development of a state but in a long run it is the demand of time to establish an independent upstream regulating organisation. The neighbouring country India established the Directorate General of Hydrocarbon as a technical arm

¹¹¹ DG Victor and others, Thurber, *Oil and Governance: State-Owned Enterprises and the World Energy Supply*, (Cambridge University Press, Cambridge 2011) 31.

¹¹² Al-Kasim, *Managing Petroleum Resources*, 175

¹¹³ Mailula (n 16) 105

¹¹⁴ Gunter (n 2)

¹¹⁵ *ibid*

¹¹⁶ Ramboll (n 38) 226.

of the concerned ministry having oversight on all contract and national oil companies are completely separated from this controlling authority.¹¹⁷

5. Conclusion and Suggestion

Bangladesh is a country of great potentiality of natural gas, which is very significant for the sustainable development of the country. For the betterment of the country, the better management of this resource is dire need and it depends on the sound policy, legal and institutional framework. Therefore, a number of instruments have been adopted from time to time to foster the exploration and production of the petroleum resources as well as the natural gas in Bangladesh. However reviewing the existing policies, legal and institutional frameworks of Bangladesh it is revealed that the existing laws, policy and the institutional frameworks are not adequate to ensure the sustainable development of the petroleum resources. Policy is very significant instrument to accelerate the exploration and production activities. The policy identifies the goal of the Government and the methods and principles of achieving that goal lead to enactment of new legislation.¹¹⁸In the history of Bangladesh the only one independent policy in the petroleum sector is the Petroleum Policy 1993 thereafter it is updated as a part of the National Energy Policy in 2004. Initiatives should be taken to update the petroleum policy independently emphasizing its importance and considering the changing circumstances.

A number of loopholes such as lack of provision of accountability and transparency of the authorised institution are found in the Bangladesh Petroleum Act 1974. No stipulation of the sustainable petroleum operation is inserted in this Act as the very concept was in a developing stage during the enactment of the Act, however, even today no such incorporation held through the amendment. Even after

¹¹⁷ Ramboll (n 38) 235.

¹¹⁸ The Policy and Law Making Process

< <https://www.etu.org.za/toolbox/docs/govern/policy.html> > accessed 10 July 2019.

the adoption of The Petroleum Policy 1993, no amendment of this Act is taken place. With formulating new policy, the rule under this Act should be promulgated for explicit rights and duties of the Government, Petrobangla and the operating companies.

The power and responsibility of Petrobangla, regulatory institution of upstream operation of petroleum sector in Bangladesh, should be decentralised. Norwegian petroleum model, where the policy making authority is vested on the concerned ministry, Norwegian Petroleum Directorate work as regulator and the national oil company work as an independent entity, may be followed to overcome this issue.

The production sharing contract should be modified to conduct the operation in more environment friendly way to safeguard the environment within the ambit of policy and legislation.

Finally, the State has to develop such policy and regulatory framework that makes it possible to integrate the petroleum operation in a balanced and sustainable manner along with its economic development. The effective sustainable upstream operation of petroleum that is natural gas depends on harmonisation of policies, laws and institutional framework. After scrutinizing the legal, regulatory and institutional frameworks related to oil and natural gas it can be concluded that, there is a need of better and well organized legal and institutional framework for the country to receive sustainable benefit from these resources. Moreover, review of the existing laws and policies on a regular interval is essential to encourage investment in this sector.

APPENDIX D

ACCEPTANCE LETTER FROM THE JOURNAL OF THE INSTITUTE OF
BANGLADESH STUDIES

ইনস্টিটিউট অব বাংলাদেশ স্টাডিজ

রাজশাহী বিশ্ববিদ্যালয়
রাজশাহী-৬২০৫, বাংলাদেশ

ফোন: +৮৮ ০৭২১-৭৫০৯৮৫, ৭৫০৭৫৩, ৭১১২১৬



INSTITUTE OF BANGLADESH STUDIES

UNIVERSITY OF RAJSHAHI
RAJSHAHI-6205
BANGLADESH

PHONE:+88 0721-750985, 750753, 711216

Letter No. IBS/E-16/2021/ ১৭৭

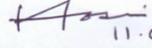
11 February 2021

Mst. Momotaz Khatun
Assistant Professor
Department of Law
University of Rajshahi

Dear Momotaz Khatun,

We are happy to inform you that your article entitled "Natural Gas Extraction in Bangladesh and the Sustainable Development Issues" has been accepted for publication in the forthcoming issue of the Journal of the Institute of Bangladesh Studies (JIBS).

Yours Sincerely,


11.02.2021(Dr. Jakir Hossain)
Professor & Director
&
Executive Editor, JIBS

APPENDIX E

ARTICLE ACCEPTED FOR PUBLICATION IN THE JOURNAL OF THE
INSTITUTE OF BANGLADESH STUDIES

Natural Gas Extraction in Bangladesh and the Sustainable Development Issues

Mst. Momotaz Khatun*

Abstract

Petroleum activities started in Bangladesh in the then British era in 1908. Thereafter several policy, legal and contractual frameworks took place to foster petroleum extraction in Bangladesh. Bangladesh discovered 27 gas fields and natural gas has become a principal source of energy. Events of gas blowouts, corruption, environmental problem etc. surrounding natural gas activities raised question whether natural gas operation is collinear with the concept of sustainable development. Contemporary issues relating to natural gas activities are analyzed in this paper in the light of the present policy, legal and contractual instruments for the purpose of achieving sustainable development goal in this sector. Suggestions are finally made to overcome the present challenges in this field.

Keywords: Sustainable development, Natural gas, Petroleum operation, Environmental protection, Production sharing contract.

1. Introduction

Petroleum and other minerals are non-renewable resources with limited reserve. Petroleum has contributed and is still contributing to the development of the world economy. Petroleum is the world's primary energy source.¹ Petroleum has contributed a lot to the technological and economic development. Conversely, it has created numerous other direct or indirect problems such as loss of fisheries, tourism and degradation of environment.²

Once the non-renewable resources are extracted and sold, they are permanently lost. Therefore, the extraction of petroleum and other mineral resources is a global concern which creates an imperative for the host country to encourage incorporation of "sustainable development" concept in different stages of the resource development. The extraction of petroleum resources also has economic consequences for any country since the extraction of petroleum liquidates the asset.³

Numerous studies have been conducted to identify the relationship between mineral development and socio-economic development as well as its effect on the environment. Different scholars have different findings about the effects of mineral development on environment and society. Habakkuk⁴ considered the productivity perspective and analyzed social and economic effects of natural resources development. Habakkuk concluded that the United States became the world leader in terms of industrial production in nineteenth century with the extraction of mineral resources. Hajkowicz et al.⁵ found that mining activity had a positive impact on incomes, housing affordability, communication access, education and employment across the local region as well as national level. On the other hand Auty⁶ explored the drawback of mineral resource extraction and proposed that the abundant natural

* Assistant Professor, Department of Law, University of Rajshahi, E-mail: momolaw@gmail.com

¹ Annual Energy Outlook [https://www.eia.gov/outlooks/aeo/pdf/aeo 2019.pdf](https://www.eia.gov/outlooks/aeo/pdf/aeo%202019.pdf) Accessed May 20, 2019.

² Gurumo, Tumaini and Han Lixin Petroleum and Sustainable Development: The Role of International Conventions 2011 *International Conference on Petroleum and Sustainable Development IPCBEE vol. 26 (2011), Singapore*

³ Hunter, Tina "Sustainable Socio-economic Extraction of Australian Offshore Petroleum Resources through Legal Regulation: Is it Possible?" *Journal of Energy & Natural Resources Law*, vol. 29, No. 2 (2011), pp. 209-246.

⁴ Habakkuk, H.J. *American and British Technology in the Nineteenth Century*. (Cambridge: Cambridge University Press, 1962).

⁵ Hajkowicz, S.A., Heyenga, S., and Moffat, K., "The Relationship between Mining and Socio-economic Wellbeing in Australia's Regions", *Resources Policy* 36, 30-38(2011).

⁶ Auty, R.M., *Sustaining Development in Mineral Economies: the Resource Curse Thesis* (London : Routledge, 1993).

resources not only failed to promote the economic growth, but also slow downed it. This paper is aimed at explaining the concept of sustainable development of natural gas and scrutinises contemporary issues related to the natural gas operations in Bangladesh. The paper also critically analyses the existing policy, legal and contractual frameworks of petroleum operation in Bangladesh and suggests some policies to overcome the challenges.

1.1 Necessity of the Study

Bangladesh is considered to be rich of gas and other mineral resources and is doing very well in its economic sector and the economy is growing very fast.⁷ The country has achieved more than seven percent GDP for the last few years and in 2019 the GDP was a record over eight percent.⁸ Besides, Bangladesh has met the challenges of Millennium Development Goals (MDG) and is known as the role model for achieving the MDGs.⁹ In 2015, Bangladesh became a member of the lower middle-income country status while in 2018, Bangladesh successfully accomplished all eligibility criteria to be recognized as ‘developing country’.¹⁰ The country is aimed at achieving the permanent status of developing country and status of developed country by 2041.¹¹ Sustained economic growth and the ambition for economic development have created an increased demand on energy. Natural gas is the primary source of energy and has become an integral part of the economy of Bangladesh. Major environmental problems happened during the period of exploration and production of oil and gas *i.e.* during upstream operation though environmental problems arise throughout the petroleum activities including upstream and downstream phases. Most of the International Oil Companies (IOCs) who are engaged in the exploration and production activities in the various developing countries have always adopted regulations that are geared towards compliance with the rules and regulations set up by host governments but they avoid adequate adoption and incorporation of environmental issues into their activities.¹² This is why this study is important to analyse a number of issues related to the sustainable development of natural gas in Bangladesh.

1.2 Objectives of the Study

The primary objective of this study is to evaluate the concept of sustainable development in natural gas operation in Bangladesh and find out the major issues that affect directly or indirectly the sustainable development of these resources. This study also tries to make some suggestions to ensure sustainable development of natural gas extraction of the country

2. Methodology

The scope of this study encompasses qualitative research of an analytical nature. Qualitative research is defined as, ‘the interpretative study of a specified issue or problem in which the researcher is central to the sense that is made’.¹³ In this line the study scrutinizes a number of national and international instruments to determine the relation of sustainability in exploration and development of natural gas. The materials from primary and secondary sources were used in this study. Relevant international conventions, policy, laws and production sharing contracts were considered as the primary source of information and articles, books, annual reports of different government and non-government organisations, newspaper articles were the secondary sources of relevant information for this study.

3. Concept of Sustainable Development

⁷ The World Bank, “Bangladesh Development Update: Economy Requires Focus on Sustainable and Inclusive Growth” Available <http://www.worldbank.org/en/news/feature/2016/04/30/bangladesh-development-update-bangladesh-economy-requires-focus-on-sustainable-and-inclusive-growth-moving-forward> (accessed Jly18, 2017).

⁸ Asian Development Bank, “Economic Indicators for Bangladesh,” <https://www.adb.org/countries/bangladesh/economy> (accessed August 8, 2020).

⁹ Bangladesh's progress on the MDGs <http://www.bd.undp.org/content/bangladesh/en/home/post-2015/millennium-development-goals.html> (accessed January 10, 2017)

¹⁰ <https://www.worldbank.org/en/country/bangladesh/overview>. accessed August 3 2020.

¹¹ Bangladesh Eligible for UN ‘Developing Country’ Status, <https://bdnews24.com/bangladesh/2018/03/17/bangladesh-eligible-for-un-developing-country-status> accessed August 3 2020.

¹² Tienhaara Kyla, “Environmental Aspects of Host Government Contracts in the Upstream Oil & Gas Sector,” *OGEL*, vol. 8, No. 3 (2011).

¹³ Peter Banister et al., *Qualitative Methods in Psychology: A Research Guide* (Open University Press, 1997): 2.

The most frequently quoted definition of the concept of sustainable development originates from the Brundtland report in 1987 as “*sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”.¹⁴ Development is the collective process of change to improve the standard of life for mankind and the society, while sustainable development refers economic, social and environmentally integrated sound development that can ensure long lasting benefit.¹⁵ In fact, the word sustainable development achieved its worldwide recognition through the Rio Conference. The present concept of sustainable development is the interconnection among three core principles, environmental, social and economic. The term is not static and it may vary according to circumstances and in particular according to time, place or subject matter. Finally, the concept sustainable development is susceptible with social, environmental economic and scientific progress and varies in time.¹⁶

At present sustainable development is a multidimensional concept aimed at environmental protection along with sustainable consumption of natural resources, health care for people, social equality, economic development, quality of life and eradication of poverty.¹⁷ This is why for the human development the protection of environment becomes the issue of more specific priority to improve the well-being at present and in future.¹⁸ However, the researchers, critiques and academics from around the world have participated in various extensive discussions on the use of sustainable development concept.¹⁹ Therefore, a growing recognition improved regarding the three essential aspects of sustainable development.²⁰

3.1 Components of Sustainable Development

The United Nations has adopted a standard definition of sustainable development based on a ‘three pillar approach’. The pillars are economic development, social equity and environmental protection.²¹ The economic aspect refers individual welfare through cost effective use of all assets comprising environmental and social expenditure to manage sectorial imbalance. Social equity contains the provision of equal distribution and opportunity and adequate social service such as health and education, gender equity, political accountability, public participation etc. The most significant objective of social equity is to prevent depletion of resources for the future generation. Environmental protection includes the requisites for diminishing waste, maintenance of biodiversity, stability of atmospheric and other ecosystem functions within environmental boundaries. It also ensures stable resource base, avoiding over-exploitation of renewable resource and depleting non-renewable resources only to some extent. Hence, to achieve those three objectives of the sustainable development another significant element is also essential named good governance. Good governance is also termed as the fourth pillar of sustainable development as there is a close connection in between economy, society, environment and government. Practically, the responsibility to carry out the objectives lies on the government.²²

3.2 Principles of Sustainable Development

Some considerable difficulties emerged to implement sustainable development due to the inherent nature of the concept. There was an urge from different corners to develop some standards or

¹⁴ *Our Common Future*, 49, U.N. Doc. A/42/427 (1987) <http://www.undocuments.net/our-common-future.pdf>. accessed December 11, 2017,

¹⁵ Marie Claire Cordonier Segger & Ashfaq Khalfan, *Sustainable Development Law: Principles, Practices & Prospects*(Oxford: Oxford University Press, 2004).

¹⁶ Barral, Virginie. “Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm,” *The European Journal of International Law*, vol. 23 No. 2(2012), pp. 377-400.

¹⁷ Ana-Maria Teodorescu, Links between the Pillars of Sustainable Development 168-173 http://feaa.ucv.ro/annals/v1_2012/EIB-12.pdf Accessed 3 May 2018.

¹⁸ Paul, Bâc Dorin. A History of the Concept of Sustainable Development: Literature Review 576-580.

¹⁹ Harris, Jonathan M. *Sustainability and Sustainable Development*, International Society for Ecological Economics (2003) <http://www.isecoeco.org/pdf/susdev.pdf> accessed February 11, 2019.

²⁰ Munashinghe, Mohan, “Sustainomics: A Trans-disciplinary Framework for Making Development More Sustainable”. International Society for Ecological Economics (2004). <http://www.isecoeco.org/pdf/sustainomics.pdf> Accessed May 4, 2018.

²¹ John Drexhage and Deborah Murphy, *Sustainable Development: From Brundtland to Rio 2012* (UN Headquarter: International Institute for Sustainable Development, 2010),p8.

²² Anis, Mohamad Danish and Tauseef Zia Siddiqui, “Issues Impacting Sustainability in the Oil and Gas Industry,” *Journal of Management and Sustainability*; vol. 5, No. 4; (2015), p.115-124.

principles of sustainable development. In order to meet the demand of developing and industrialized countries a meeting was held in New Delhi in 2002 with a view to guide the lawful activities and policy formulation for international law on sustainable development.²³ These principles identified by International Law Association Committee on Legal Aspect and contained in its New Delhi Declaration of 2002 developed a set of seven principles of international law relating to Declaration.²⁴ The principles are: (i) sustainable use of natural resources; (ii) principle of equity: inter-generational and intra-generational; (iii) common but differentiated responsibilities; (iv) precautionary approach to human health, natural resources and ecosystems; (v) principle of public participation and access to information and justice (vi) principle of good governance; (vii) principle of integration and interrelationship in relation to human rights and social, economic and environmental objectives. Though the seven principles are contained in the New Delhi Declaration another important principle emerged from the Rio Declaration which is popularly known as the polluter pays principle.

Though the principles derived from soft law instrument like declaration, these possess some persuasive force for a declaration being able to create some rights and obligations for the states through its normative character.²⁵ In fact the foundation of these principles was laid long time ago in the Stockholm Declaration of 1972, Rio Declaration of 1992 and Brundtland Report of 1987 but the principles have come to light in an organised form through the New Delhi Declaration.

3.3 Sustainable Development Law

The concept of sustainable development has been improved over time and became multidimensional.²⁶ The term achieved a wide scale of popularity throughout the world but there is a continuous debate among the legal scholars regarding the normative status and the implementation problem.²⁷ Some legal professionals think that sustainable development is not a principle of customary international law though some other consider it a principle of law with normative status. A number of scholars are of the opinion that to have a normative status the concept of sustainable development is too vague and ambiguous in meaning.²⁸ While many scholars deem that the question about the legal status of the concept of sustainable development is immaterial it has already obtained a place in international law lexicons and now the matter of concern is the way to apply it in specific practical situations.²⁹ Mauerhofer³⁰ added that law is considered an essential prerequisite to sustainable development. The recognition of the term sustainable development in international law has been gained through UNCED.³¹ In this regard principle 27 of the Rio Declaration states that “States and people shall co-operate in good faith and in a spirit of partnership in the fulfillment of the principles embodied in this Declaration and in the further development of international law in the field of sustainable development”.³² The same is confirmed through Chapter 39 of Agenda 21 of United Nations Conference on the Environment and Development. Therefore, sustainable development is the convergence of social, economic and environmental law since the social, environmental and economic obligations can overlap or even conflict. Sustainable development law comprises a major part of the international environmental law and subsequently, a reasonable threat exists as to the loss of

²³ International Law Association, “ILA New Delhi Declaration of Principles of International Law Relating to Sustainable Development,” *International Environmental Agreements: Politics, Law and Economics* 2: 211–216, (2002).

²⁴ Barnard, M., “The Role of International Sustainable Development Law Principles in Enabling Effective Renewable Energy Policy – A South African Perspective,” *Potchefstroom Electronic Law Journal* Vol 15 No 2 p. 207-243. <http://www.saflii.org/za/journals/PER/2012/21.pdf> accessed 10 March 2018.

²⁵ Duncan French, *International Law and Policy of Sustainable Development* (Manchester University Press, 2005) 97 cited in M Barnard, *The Role of International Sustainable Development Law Principles in Enabling Effective Renewable Energy Policy – A South African Perspective* Potchefstroom Electronic Law Journal Vol 15 No 2 pp. 207-243. Available at <http://www.saflii.org/za/journals/PER/2012/21.pdf> Accessed 10 March 2018.

²⁶ Rockwood, Larry, Ronald Stewart and Thomas Dietz, *Foundations of Environmental Sustainability* (New York: Oxford University Press 2008) 176.

²⁷ Lowe, V. *Sustainable Development and Unsustainable Arguments*, in Boyle & Freestone (eds.): *International Law and Sustainable Development: Past Achievements and Future Challenges* (1999), p. 24.

²⁸ Marong, A.B.M. “From Rio to Johannesburg: Reflections on the Role of International Legal Norms in Sustainable Development,” *Geo. International Environmental Law Review* vol. 21 (2003),p.57.

²⁹ *Ibid.*

³⁰ Mauerhofer, V. *Legal Aspects of Sustainable Development: Horizontal and Sectorial Policy Issues*, 1st edn, (Cham, Springer International Publishing, 2016),p.2

³¹ United Nations Conference on Environment and Development, please see <https://sustainabledevelopment.un.org/>

³² Principle 27, Rio Declaration, United Nations Conference on Environment and Development,

autonomy of international environmental law as a separate branch of international law. In this regard Lowe³³ mentioned “not all aspects of the law relating to sustainable development are necessarily relevant to the protection of the environment, nor do all aspects of international environmental law concern sustainable development.” According to Canuel,³⁴ sustainable development law has also been interpreted by including land use controls that recognize the intersection of environmental issues and economic development.

3.4 Importance of Sustainable Development Goals (SDGs) in the Oil and Gas Industry

The United Nations General Assembly adopted the SDG on 25 September 2015 through Agenda 2030 for Sustainable Development for the next 15 years. The leaders from 193 countries were in consensus to adopt a number of 17 goals to ensure better future for the generation of the next 15 years.³⁵ The goals were designed to address the globally pressing socio-economic and environmental problems and assist the global communities to outline their national development agenda in the light of these sustainable development goals. In addition, the participants recognised the role of the private sector to attain these SDGs. To attain the SDGs there are involvement of a number of contributors as governments, local communities, civil society organizations, and the private sector including the oil and gas industry.³⁶ Among the 17 goals number 7 goal is to **ensure access to affordable, reliable, sustainable and modern energy for all**. There is a lot of potentiality of the natural gas industry to contribute in attaining the SDGs of now and to 2030, designed by the United Nations General Assembly. As a fuel natural gas is cleaner than other fuel such as oil and coal because its green house gas emission is lower.³⁷ The natural gas operation has both positive and negative contributions to attain the total 17 sustainable development goals. The natural gas operation can contribute in a number of ways by creating employment opportunity, revenue generation, community consultation, ensuring health and safety measures during operation, infrastructural development, industrialisation and finally environment friendly operation.³⁸ Though it has some negative impact on climate change, conservation of ecosystem and biodiversity, sustainable water management and intergenerational equity which are also the part of the SDGs but if natural gas industry can adopt a sustainable extraction policy and can implement them prudently the natural gas operation can positively contribute to achieve those goals rather impact adversely.

4. Sustainable Development Concept in Petroleum Operation

The aim of the contemporary mining activities is to maximize production without paying attention to its long term effect. The effect of mining on the adjoining environment does not restore to its original form soon after the closing of the mining activities. These situations continue yet after the completion of the extraction and environmental and social disruption are left to the local communities and the future generation.³⁹ It is realized by the mineral industry that the output of these activities improves standard of living and updates it to time so the operation must be done in a manner not to harm the environment and the planet itself, therefore to make an environment to ensure the benefit of the coming generation.⁴⁰ However, there are general perceptions among the people that the petroleum industry does not manage risk adequately, operate transparently, or create benefits for society.⁴¹

³³ Lowe, p. 24

³⁴ Canuel, Edward. “Sustainable Development, Natural Resource Extraction, and the Arctic: the Road Ahead,” *Alaska Law Review* vol.33:1 (2016), pp. 31-64.

³⁵ Sustainable development goals, <https://www.un.org/sustainabledevelopment/sustainable-development-goals/>

³⁶ UN General Assembly, *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1.

³⁷ Natasha Sinclair, Contributing to the Sustainable Development Goals in Oil and Gas, *Advisian, Worley Parsons Group*, 08 September 2017

³⁸ Mapping the Oil and Gas industry to the Sustainable Development Goals: An Atlas, p4. Available at http://www.ipieca.org/media/3093/mapping_og_to_sdg_atlas_lr_2017.pdf accessed 8 May 2018

³⁹ Elizabeth Bastida, “Managing Sustainable Development in Competitive Legal Frameworks for Mining: Argentina, Chile and Peru Experiences”, *Integrating Sustainability into Legal Frameworks for Mining: Trends in Selected Latin American Countries* p.1-25.

⁴⁰ The Mining Industry and Sustainable Development, *society for mining , metallurgy and exploration*.(2016). https://www.eenews.net/assets/2016/06/29/document_pm_01.pdf accessed June 10, 2019.

⁴¹ Shields, Deborah J. “Applying Sustainable Development Principles and Sustainable Operating Practices in Shale Oil and Gas Production,” *The Open Petroleum Engineering Journal*, vol.9, (2016), p.137-149.

Necessity of balance between the petroleum exploration and the physical, ecological and human environment is thus realized. It is only possible through sustainable petroleum operation.

Increasing consciousness for three pillars of sustainable development, economic, social and environment, along with the technological development reveals that if the mining operation is managed properly it can play a vital role in creating lasting benefits for local communities and the large population.⁴² Sustainable development concept implies that petroleum should be exploited in a wise and optimal manner. In case of petroleum industry sustainable development refers that the industry contributes the maximum benefit to the society minimizing its negative effect and the benefit must be long lasting with due consideration of economic, social, ethnic and environmental aspect.⁴³ At a glance it may be seemed that the concept of sustainability is not compatible with non-renewable or petroleum resources because once it is extracted it is permanently lost and cannot be reproduced, so sustainability is not possible. However a close scrutiny of the issue reveals a different aspect.

Exploitation of petroleum resources contribute to the rapid economic growth of a country but after the depletion, which is inevitable, of these resources the state has to face a negative economic growth because it is not possible to continue development process as earlier. This development is not sustainable. In this aspect sustainability refers the maximum recovery with minimizing its adverse effect. Thus, the first guiding principle of sustainable development is that it must be reasonable in economical acquisition and rate of use of mineral resources.⁴⁴

During the first half of the 20th century, sustainable development in the oil and gas sector refers the enactment of relevant laws and regulations, which are required to protect oil and gas resources through a number of mechanisms.⁴⁵ Nevertheless, in recent time sustainable development requires lasting socio-economic benefit and protects environmental degradation with due consideration to the future generation. The concept of sustainable development achieved its worldwide attention through the Rio Conference but there is no any specific chapter in Agenda 21 adopted in this conference, regarding the sustainability in the mining or the petroleum sector but some of the provisions are directly or indirectly related with the issue. However, the “Berlin Guidelines”⁴⁶ provide some of the area of consideration for sustainable mineral exploration.

In most of the literatures sustainable development prioritises the protection of the environment and other two pillars remain dormant. However, social and economic aspects of sustainable development in mining project should be of equal importance as in case of environmental sustainability. Social aspect of sustainable development can be achieved through fair distribution of benefits and costs of mining. There is also the need of involving local communities affected by a mining project and considering their views in decision-making through appropriate processes of participation and dialogue.⁴⁷

Similarly, the economic aspects of the sustainable development can be achieved through creating and sustaining mineral wealth in maximising human living standards. Depletion of resources needs to be considered carefully. Resource depletion can be managed through the concept of sustainable development that is reinvestment of the revenues generated from mining to build human and social capital and serve future generation.⁴⁸

⁴² Remy, Felix and Gary. MacMahon *Large Mines and Local Communities: Forging Partnerships, Building Sustainability* World Bank Group's Mining Department, 2002 Available at <http://siteresources.worldbank.org/INTOGMC/Resources/largemineslocalcommunities.pdf> accessed 3 July, 2018.

⁴³ Vinogradov, Sergei, “Environmental Protection in the Petroleum Industry,” *Encyclopaedia of Hydrocarbons* vol 4, p507-523.

⁴⁴ Dubiński J., Turek M., Wachowicz J., Hard Coal Mining and the Idea of Sustainable Development. Proc. Intern. Scientific Conference – School Underground Exploitation, Dniepropetro-wsk, p. 27–38(2007). Cited in Józef Dubiński Sustainable Development of Mining Mineral Resources Vol. 12 (2013), No. 1, p.1–6.

⁴⁵ Weaver, Jacqueline Lang, “Sustainable Development in the Petroleum Sector” p. 51 in A. Breadbrook, & R. Ottinger (Eds.), *Energy law and Sustainable Development*. IUCN, Environmental Policy and Law Paper No.47, The World Conservation Union

⁴⁶ Berlin II Guidelines for Mining and Sustainable Development, United Nations, 2002. Available at https://commdev.org/userfiles/files/903_file_Berlin_II_Guidelines.pdf accessed 5 July, 2018.

⁴⁷ Bastida, Elizabeth, “Managing Sustainable Development in Competitive Legal Frameworks for Mining: Argentina, Chile and Peru Experiences”, *Integrating Sustainability into Legal Frameworks for Mining: Trends in Selected Latin American Countries* p.1-25

⁴⁸ Bastida, p.1-25

4.1 Natural Gas in Sustainable Development

In the modern world natural gas plays a vital role in the energy structure and makes a greater contribution to energy conservation and emission reduction. Performance of natural gas with respect to emission level compared to other sources of fuel is shown in Table 1. Natural gas is such a kind of petroleum resource of low carbon, high efficiency and clean energy that optimize energy structure and thus crucial for national economic development.⁴⁹

Table 1: Fossil fuel emission level (Pounds per Billion BTU⁵⁰ of Energy Input)⁵¹

Pollutant	Natural Gas	Oil	Coal
Carbon Dioxide	117,000	164,000	208,000
Carbon Monoxide	40	33	208
Nitrogen Oxides	92	448	457
Sulfur Dioxide	1	1,122	2,591
Particulates	7	84	2,744
Mercury	0.000	0.007	0.016

Extraction of natural gas by its very nature is environmentally intrusive. It is not only in case of gas extraction but every mining activity causes environmental degradation to some extent which includes water pollution, gas flaring and dust, deformation of ground surface, impoverishment of soil, noise and vibration.⁵² It also affects a number of socio-economic consequences related with the exploration activities which requires infrastructural development of the concerned area, health and safety problem, interest of the local community and their rehabilitation and the management of the gas field etc. During the production and exploration stage all of these should be taken with due consideration.

5. Natural Gas Extraction in Bangladesh

The history of Bangladesh to explore the petroleum resources trace back in the later part of the 19th century during the British rule in the undivided Indian subcontinent. The exploration activity was not in an organized form.⁵³ The first discovery of oil in this region was in Digboi of Assam in the year of 1890.⁵⁴ The first drilling took place in Bangladesh region by Indian Prospecting Company in the year of 1908 near the Sitakund, Chittagong and the first exploratory shallow well was drilled by the Burma Oil Company (BOC) in 1914 but no success was found.⁵⁵ Then two exploratory drilling was conducted by BOC between 1923 to 1933 in Patharia and the sign of oil was found in one well but there was no any commercial production.⁵⁶ Thereafter during the period 1950 to 1971 the National Oil and Gas Development Corporation of Pakistan and some IOCs conducted their exploration activities, drilling 22 wells including offshore and onshore. This period is called the golden time for petroleum in Bangladesh as a number of 8 gas fields were discovered while 5 gas fields were discovered by IOCs and 2 fields by the then Pakistan Petroleum Ltd. and 1 by National Oil and Gas Development

⁴⁹ Su, Yi and Kedong Luo, "Study on the Sustainable Development of Natural Gas Resources in China," *Journal of Clean Energy Technologies*, Vol. 3, No. 6, November 2015.p 448

⁵⁰ British Thermal Unit

⁵¹ *Natural Gas: Issues and Trends* (Washington DC: Energy Information Administration, 1998) Available at <https://www.eia.gov/naturalgas/archive/056098.pdf> Accessed July 07, 2019.

⁵² Dubinski, Jozef, "Sustainable Development of Mining Mineral Resources", *Journal of Sustainable Mining*, vol 12 No. 1(2013),p.1-6.

⁵³ Gunter, Bernhard G. Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions, Bangladesh Development Research Working Paper Series (BDRWPS) no.3 (December 2008) p 2.

⁵⁴ Ibid.

⁵⁵ Haque, Md. Rashidul, "Effects of Petroleum Legislation on Hydrocarbon Exploration and Development in Bangladesh, (Masters of Engineering Thesis, Bangladesh University of Engineering and Technology, 2000), p.16.

⁵⁶ Centre for Policy Dialogue, *Bangladesh Gas Sector Development: Status, Policy Options and Challenges* Report No. 24, (2000), p.150. http://www.sdnbd.org/sdi/issues/natural_gas/report/Bb%20Gas%20Sector%20Dev%20Status%20Policy%20Options%20%20Challenges.PDF accessed April 9, 2019.

Corporation of Pakistan.⁵⁷ The first gas field was discovered in 1955 at Haripur and the second field in 1959 at Chattak in Sylhet district.⁵⁸ Two other major gas fields of Bangladesh were discovered during this period namely Titas and Hobiganj gas fields in the year 1962 and 1963 respectively.⁵⁹ The natural gas extraction was first begun in the year of 1960 at Chattak by Pakistan Petroleum Ltd.⁶⁰ After the independence of Bangladesh, the exploration of petroleum started with a new parameter both by national and international oil companies. In the year of 1975, the government purchased 5 gas fields from IOCs and established a sole national ownership of the national oil companies for the first time.⁶¹ It was a great decision of the government to secure the energy sector of Bangladesh. Thereafter a number of wells were drilled and 7 gas fields were discovered including 1 offshore gas field. Till today, the country has discovered 27 gas fields and the 27th was discovered at Bhola by BAPEX⁶², the national oil company.⁶³ According to the report of Petrobangla out of 27 gas fields 21 gas fields are under production, production is suspended in 4 fields and 2 fields are yet to produce viz the Kutubdia and Bhola gas fields.⁶⁴ Despite the increase rate of production to meet the rising demand of different sectors the gap between supply and demand is widening day by day. During December 2016 the daily production of gas was 2700 MMSCFD⁶⁵. Now Bangladesh produces 2.7 billion cft⁶⁶ while the demand is 3.4 billion cft. The major consumers are the power plants, which consume 58%, factories 17%, household 11%, fertilizer industry 7%, and automobiles 6%.⁶⁷

5.1 Legal and Regulatory Framework for Natural Gas Operation in Bangladesh

Natural gas operation involves a series of tasks. Management of natural gas operation or any other petroleum operation is very challenging for the government of any country as a number of organizations such as public officials, state owned organizations and private firms are involved in this function.⁶⁸ There are different policies and contractual and legislative frameworks to perform petroleum operation. The regulatory framework of petroleum operation determines the extent of the role of the government to define the laws and policies and performing regulatory functions.⁶⁹

All natural gas operations in Bangladesh take place according to the Bangladesh Petroleum Act 1974 and Petrobangla has been established with the responsibility of exploration, production, distribution and marketing of the natural gas in Bangladesh under the Bangladesh Oil, Gas, and Mineral Corporation ordinance 1985. Petrobangla is considered the sole authority to conduct the petroleum operations in Bangladesh. A number of laws enacted relating to the exploration, extraction, development and transmission of natural gas such as the Mine Act 1923, the Petroleum Act 1934, The Petroleum Rules 1937, The Regulation of Mines, Oil-Fields and Mineral Development (Government Control) Act, 1948 that is repealed by the Petroleum Act 1974, the Bangladesh Energy Regulatory Commission Act 2003, the Bangladesh Gas Act 2010 and the Petroleum Act 2016 and this Act repealed the Petroleum Act 1934. Bangladesh follows Production Sharing Contract (PSC) as contractual model. The first model PSC was placed in 1988 and thereafter modification were made in 1997, 2008, 2012 and 2019 to accommodate different needs specially to attract foreign investments in petroleum sector.

6. Contemporary Issues in Natural Gas Sector in Bangladesh

Bangladesh is utilizing natural gas in different sectors and it has become an integral part of the country's economy. Natural gas is the most cost-competitive option for electric power generation.

⁵⁷ Haque, p.16.

⁵⁸ Centre for Policy Dialogue, p.150.

⁵⁹ Haque, p. 17.

⁶⁰ Murshid, K.A.S. and Arne Wiig, "A Review of Development Trends in the Energy Sector of Bangladesh", Report R 2001: 3, Chr. Michelsen Institute *Development Studies and Human Rights*. p 12

⁶¹ Petrobangla Annual Report 2017, p 17

⁶² Bangladesh Petroleum Exploration & Production Company Limited

⁶³ Rasel, Aminur Rahman, "BAPEX Discovers New Gas Field in Bhola," *Dhaka Tribune*, December 13, 2018.

<https://www.dhakatribune.com/bangladesh/power-energy/2018/01/15/bapex-discovers-gas-bhola-2> accessed April 10, 2019.

⁶⁴ Petrobangla Annual Report 2017, p 18.

⁶⁵ Million standard cubic feet per day

⁶⁶ Cubic feet

⁶⁷ Bangladesh Discovers New Gas Field in Southern District of Bhola, *bdnews24.com*. 23, 10 2017

⁶⁸ Bernhard G. Gunter, Mineral Extraction in Bangladesh: Some Fundamental Reform Suggestions Bangladesh Development Research Working Paper Series No. 3 (December 2008).

⁶⁹ Hossain, Kamal, *Law and Policy in Petroleum Development* (New York: Nichols Publishing Company, 1979), p.32.

Natural gas is the primary fuel for electric power generation and 81% of the electricity generation in 2011 dependent on it.⁷⁰ Bangladesh has also developed gas-intensive industries such as fertilizer which is highly subsidized to ensure food security. In fact natural gas contributes the major part of the country's present energy source and energy options are limited for Bangladesh.⁷¹ Bangladesh is continuously trying to discover new gas fields as the demand is increasing day by day. It is estimated that the demand of natural gas will grow by around 6 percent over the next two decades.⁷² However, certain incidents in the natural gas sector have raised the questions whether the natural gas operation complies with the concept of sustainable development.

6.1 Gas Reserve

Although Bangladesh has discovered 27 gas fields total proven gas reserve is in controversy and highly uncertain.⁷³ According to the official website of Petrobangla the proven reserve of gas was 20.77 TCF⁷⁴ and the remaining reserve as on January 2016 is 13.60 TCF.⁷⁵ In a parliamentary debate in 2020 State Minister for Power, Energy and Mineral Resources of Bangladesh described that the present stock of gas reserve is 10.63 TCF while the daily production is 2579 MMCF and the reserved gas will be exhausted within next eleven years if the present production rate is continued.⁷⁶ It requires that the country has to enhance its exploration activities to meet the sharply rising demand and ensure a sustainable production for energy security of Bangladesh.

6.2 Protection of Environment

Bangladesh has faced several blowouts such as Sylhet-1 in 1955, Sylhet-4 in 1962, Magurchara in 1997 and Tengratila gas field in 2005 which are liable for alarming environmental degradation in natural gas sector.⁷⁷ These blowouts caused huge amount of gas burning and severe damage to nearby areas and wildlife.⁷⁸

Although several blowouts have taken place in Bangladesh there is no specific term by which the safety of the gas fields can be ensured. Article 9 of the Model Production Sharing Contract (MPSC) may be referred which states that the operation of petroleum and production from the field will be consistent with sound international petroleum industry practice and good conservation economic practice.⁷⁹ It may be kept in mind that there is no universally recognized codified sound international petroleum industry practice.

Environment impact assessment is one of the prior conditions to carry out the petroleum operation. Contractor is obliged to conduct Initial Environment Examination (IEE), Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) before the petroleum operation under the Bangladesh Environment Conservation Act 1995 and Bangladesh Environment Conservation Rules 1997 according to the production sharing contract. The contractor is also obliged

⁷⁰ Herath, Gunatilake and David Roland-Holst. "Energy Policy Options for Sustainable Development in Bangladesh," ADB Economics Working Paper Series Paper no 39 (2013) p.9.

⁷¹ Bangladesh energy study-Executive summary, Asian Development Bank, Manila, 1975. <https://www.adb.org/countries/bangladesh/main> accessed July 19, 2017.

⁷² Bangladesh Institute of Development Studies and Global Subsidies Initiative of the International Institute for Sustainable Development. (2012). *A Citizen's Guide to Energy Subsidies in Bangladesh*. Dhaka and Geneva. http://www.bids.org.bd/files/ffs_bangladesh_czguide.pdf (accessed June 18, 2017).

⁷³ In 2001, a joint research project with the United States Geological Survey estimated the country's total potential natural gas at 30 TCF. However, the recoverable amount was unclear. See also Herath Gunatilake and David Roland-Holst, *Energy Policy Options for Sustainable Development in Bangladesh* (ADB Economics Working Paper Series, 2013) <https://www.adb.org/sites/default/files/publication/31141/ewp-359.pdf> accessed July 15, 2017.

⁷⁴ Trillion cubic feet

⁷⁵ <http://petrobangla.org.bd/?params=en/gasblockandreserve/reserve/> accessed November 30, 2016.

⁷⁶ Country's gas reserve will be exhausted in 11 years: Nasrul Hamid, The Daily Star, January 20, 2020.

⁷⁷ Khan, Md. Ashraful Islam and Fuad Bin Nasir, "A Review over Major Gas Blowouts in Bangladesh, their Effects and the Measures to Prevent them in Future," *International Journal of Scientific & Technology Research* 3, no. 9 (2014):109-113.

⁷⁸ According to some unofficial estimate by the National Committee to Protect Oil-Gas-Mineral Resources and Port, gas reserve of about 245 billion cubic feet was burnt in the explosion and caused loss of more than Tk 9000 crore. The wildlife, environment, and ecology of the area were also severely affected due to the blowout. See also "Bangladesh: Gas explosion: Compensation from Niko, Unocal Demanded," *The New Nation*, June 13 2006. <http://www.corpwatch.org/article.php?id=13727> (accessed September 20, 2017) and "No Compensation of Blowout in 19 years," *The New Nation*, October 07, 2017. <http://thedailynewnation.com/news/97027/no-compensation-of-blowout-in-19-years.html> accessed October 7, 2017.

⁷⁹ The Model Product Sharing Contract 1997, Articles 9.6 and 9.7

to obtain the clearance certificate from the Ministry of Environment and Forest of the country.⁸⁰ However, there is no transparent way to ensure those assessments as well as the mitigation process that will be undertaken to minimize the environmental harm. UK, the 10th cleanest country of the world⁸¹ according to the report of the Transparency International, ensures the Environment Impact Assessment (EIA) and other instruments related to petroleum operation in an efficient and effective way. It is possible through proper legal and regulatory mechanism of the UK.

Lacking in administrative as well as regulatory process is observed in case of natural gas operation in Bangladesh. Though there were several blowouts, there was no initiative to prevent further such blowout. On the contrary, Australian government formed a Commission of Inquiry into the Montara Incident, occurred on 21 August 2009, to examine the causes of the incident. The Commission found a number of regulatory failures and recommended the establishment of a single, independent regulatory body with the objectives of providing safety, well integrity and environmental management.⁸²

The initiatives taken by the developed country to meet the environmental challenges are recommendable. The role of the IOCs is also a matter of great concern for developing country like Bangladesh as the multinational oil companies play a double standard in developed and developing world regarding the social and environmental mitigation effort.⁸³

6.3 Access to Information

One of the requirements of sustainable natural gas operation is the right of access to information. None of the model PSCs provides such right to the people. Article 25.1 of the model PSC 2008 states that the contractor shall prepare and maintain the data and information of operation during the contract period in conformity with law or requirement of Petrobangla and submit to Petrobangla.⁸⁴ The authority to justify its compliance is not defined as there is no access of people other than the appointee of Petrobangla. In this regard, the law of the country and the interest of the country is the prior importance and the public has the right to justify its validity without unreasonable restriction. Article 26.7 of the MPSC 2008 provides the right to disclose information to its employees, affiliates, consultants, sub-contractors or others to the extent necessary to conduct petroleum operation efficiently. It is clear from this article that the public are excluded from the domain of ‘others’ as it states that without prior approval of the Petrobangla the contractor is not allowed to announce or make statement of any data or information in public.⁸⁵ Article 26.9 of the onshore MPSC implies that all data and information are strictly confidential even for a period of 5 years after the termination of the contract.

6.4 Report on Sustainability

Any company engaged in the operations related to natural gas should submit monthly, quarterly and annual progress reports to Petrobangla. The progress report should contain geological survey data, drilling data and data on production of natural gas, gas reserves, safety program etc. There is no any specific section in the model production sharing contract to include the issues related to sustainable development of natural gas. The most interesting thing is that the term ‘‘sustainable’’ or ‘‘sustainable development’’ is not found in the model production sharing contract. Sometimes, the oil and gas companies do report voluntarily on this issue. A survey⁸⁶ on various correspondents of oil and gas companies located in Middle East region found that there is no any specific department regarding any aspects of sustainability in their organization. This indicates a huge gap between ideal and real

⁸⁰ Article 10. 23 (a) of the Model Production Sharing Contract 2012.

⁸¹ Transparency International: Corruption Perceptions Index 2015 [<http://www.transparency.org/cpi2015>] accessed 19 August 2016

⁸² Regulatory Framework for Oil and Gas Exploration and Production https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Oilorgasproductio n45/Report/c02 accessed August 18, 2019.

⁸³ Benjamin Maiangwa and Daniel E. Agbibo, Oil Multinational Corporations, Environmental Irresponsibility and Turbulent Peace in the Niger Delta, *Africa Spectrum*, 2013, Vol. 48, No. 2 (2013), pp. 71-83, Sage Publications, Ltd. <https://www.jstor.org/stable/24589097>

⁸⁴ Petrobangla Model Product Sharing Contract 2008, Article 25.1.

⁸⁵ Model Production Sharing Contract 2008, Article 26.13.

⁸⁶ Mojarad, Ali A. Sadeghi, Vahid Atashbari and Adrian Tantau, ‘‘Challenges for Sustainable Development Strategies in Oil and Gas Industries,’’ *Proceedings of The 12th International Conference on Business Excellence* (2018), p. 626-638 DOI: 10.2478/picbe-2018-0056.

position of the industry in terms of getting prepared for the challenges of the future. Despite the commitment to sustainable development of oil or gas, the oil and gas companies could not alter the perceptions of the public, customers, NGOs and others regarding their activities. It is evident that public reporting is not sufficient to convince internal and external stakeholders.⁸⁷

6.5 Participation of Different Stakeholders

Schneider et al.⁸⁸ reported that oil and gas companies represent a significant portion of wealth among the world's major industries. However, business decisions of these companies which address sustainability should be improved and there is a need of considering other stakeholders such as the government, employees, consumers, suppliers, the community and the environment. In community consultation process there are three concerned parties, the local community, the government and the operating company, the relationship is a trilateral one and the consultation among the three representatives contribute to the establishment of a balanced development.⁸⁹ In the Environment Conservation Act of Bangladesh it clearly states that the Director General (DG) may arrange public hearing as to the matter of pollution of environment when any person, affected or likely to affect, applies to him⁹⁰. The inclusion of application for hearing from the affected parties is one of the obstacle to ensure public participation as this provision is added to ensure the participation of the local community in the decision making process. Petroleum operation, by its very nature, is environmentally intrusive and people of the local community are subject to negative environmental impact. However, no provision of public hearing is added in the PSC of Bangladesh recognizing the responsibility of the parties to participate in and contribute to a decision-making process that will ensure sustainable development. As a result the local experts or the people of the adjoining area cannot participate in the decision making process on the sustainable development issues.

6.6 Illegal Dealings in Contractual Process

Petroleum operation involves a huge amount of investment and cash flow which tends to corruption.⁹¹ In developing countries, where several IOCs are in petroleum operation, there is always an interaction between the oil companies and government.⁹² Bangladesh is no exception to the situation. There is instance of making agreement with relatively less qualified, both technically and financially, international oil company NIKO for the exploration of natural gas. There is clear evidence of giving bribe to get the contract of exploration which contributed a lot to blowout that not only destroyed billions of cubic feet of gas but also forced thousands of nearby villagers to evacuate.⁹³ A massive environmental degradation also occurred because of the blowout. In this case NIKO procured a joint venture agreement with BAPLEX a subsidiary to the Petrobangla. Through this example, some organisational loopholes are evident in the regulatory framework. Lack of transparency and accountability is one of the vital reasons behind this.⁹⁴ Transparency and accountability are preconditions of good governance and good governance is the fourth pillar of the sustainable development. Petrobangla is the sole regulatory authority for any petroleum operation in Bangladesh, which also takes part in the petroleum operation as a contractor. Nevertheless, the accountability of the Petrobangla is not clear.

7. Suggestions and Conclusion

Petroleum operation includes many different types of activities which require huge investment, technology, skilled manpower and heavy machineries etc. As a result there is involvement of many

⁸⁷ Muir, James and Yoke Mun Chan, "Capturing Sustainability Issues in the Oil and Gas Industry", *SPE International Conference on Health, Safety and Environment in Oil and Gas Exploration and Production*, 20-22 March (2002), Kuala Lumpur, Malaysia.

⁸⁸ Schneider, Jennifer; Ghetas, Salim; Merdaci, Nacer; Brown, Mervin; Martyniuk, Joseph; Alshehri, Waleed; and Trojan, Anthony "Towards Sustainability in the Oil and Gas Sector: Benchmarking of Environmental, Health, and Safety Efforts," *Journal of Environmental Sustainability*: Vol. 3 n.3(2013).

⁸⁹ Large Mines and Local Communities: Forging Partnership, Building Sustainability, Mining and Development, World Bank and International Finance Corporation, 2002

⁹⁰ Section 8(2) of The Bangladesh Environment Conservation Act, 1995.

⁹¹ Kenneth K. Joe, The Awarding of Petroleum Exploration and Production Rights and Incorporation of Environmental Rules in Kenya: Lessons from United Kingdom (UK) and Norway, Master's Thesis, University of Eastern Finland, p. 84.

⁹² K. Talus (Ed.), *Research Handbook on International Energy Law*. (Edward Elgar Publishing, 2014), p. 475.

⁹³ Ghani, Moin "The Fascinating Niko Graft Case", *The Dhaka Tribune* November 11, 2018 <https://www.dhakatribune.com/opinion/op-ed/2018/11/11/the-fascinating-niko-graft-case> accessed March 10, 2019.

⁹⁴ Talus (Ed.), *Research Handbook on International Energy Law*. (Edward Elgar Publishing, 2014), p. 475

different companies in a single petroleum operation which leads to invitation of foreign oil and gas companies. Other challenges of sustainable development of gas or oil are seem to increase in the developing countries due to the following facts:

- (a) international oil companies maintain a double standard approach that is they provide developing countries with lower environmental and health values than what is obtainable in their home states;⁹⁵
- (b) developing countries lower their environmental and health standards in an effort to increase competitiveness and attract investment;⁹⁶ and
- (c) pressure from international monetary/donor agencies forces the developing countries to take untimely and inappropriate steps as well as to accept unreasonable conditions.⁹⁷

In addition, inefficiency, corruption, abuse of natural monopoly powers, bureaucratic red-tapism etc. in the petroleum sector especially in the developing countries progressed backwards against expectations.⁹⁸ Similar trend is also observed in the petroleum sector of Bangladesh. Research reports also indicate that poor infrastructure, unclear policy, sketchy regulation, corruption, poor governance, lack of funds, skill, knowledge and political commitment have hindered the progress of the gas sector in Bangladesh.⁹⁹

Analysis of the existing legal and contractual frameworks reveals that there is urgent need of specifying certain things such as access to information, reporting sustainable issues, provision for public participation etc. Similarly, clear statement should be inserted in the model production sharing contract so that the oil companies can adopt necessary policies for protecting environment through ensuring safety measures in exploration and production activities as well as for protecting the neighbourhood people and their culture.

The current development trends and ambition for future development require secured energy source and uninterrupted energy supply in Bangladesh. The growing demand of energy has increased the importance of natural gas in the economy of the country. Focus should be given to sustainable natural gas activities as well as to obtaining additional benefits from this sector. Most of the oil companies are prioritized on optimum extraction to maximize their profit and the developing countries like Bangladesh focuses on revenue generation. A better legal and regulatory framework can ensure proper co-ordination among the conflicting interests of the state, companies and other stakeholders that may lead to sustainable petroleum operation resulting in sustainable development of natural gas of Bangladesh.

⁹⁵ Adonis E. Hoffman "Oil and Politics Make for Dangerous Mix in Nigeria", *Los Angeles Times*, September 11, 1994 <https://www.latimes.com/archives/la-xpm-1994-09-11-op-37147-story.html> accessed May 7, 2019.

⁹⁶ D. Hunter and S. Porter, "International Environmental Law and Foreign Direct Investment", in D.D. Bradlow and A. Escher (eds.), *Legal Aspects of Foreign Direct Investment*" (London: Kluwer Law International, 1999), p. 163.

⁹⁷ M. Tamim, "Policies and Priorities in Bangladesh Gas Sector Planning", *Energy for Sustainable Development*, 7(2) p.57-65 (2003). DOI: 10.1016/S0973-0826(08)60355-5

⁹⁸ A. Ikein and C Briggs-Anigboh, *Oil and Fiscal Federalism in Nigeria: The Political Economy of Resource Allocation in a Developing Country* (Ashgate, 1998) 227-240 cited in Olutumbi A. Babayomi, "A Review of the Key Provisions of the Petroleum Industry Bill and the Implications on Deregulation", *Journal of Sustainable Development Law and Policy* (2014) 3:1, p. 189-201..

⁹⁹ M. Tamim, "Policies and Priorities in Bangladesh Gas Sector Planning", *Energy for Sustainable Development*, 7(2) p.57-65 (2003). DOI: 10.1016/S0973-0826(08)60355-5