IMPACT OF FOREIGN DIRECT INVESTMENT ON ENVIRONMENT IN INDIA AND BANGLADESH: A COMPARATIVE STUDY, 1991-2014

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DECLARATION

I declare that the thesis entitled **"Impact of Foreign Direct Investment on Environment in India and Bangladesh: A Comparative Study, 1991-2014"** submitted by me for the award of the degree of **Doctor of Philosophy** of Jawaharlal Nehru University is my own work. The thesis has not been submitted for any other degree of this University or any other university.

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CERTIFICATE

We recommend that this thesis be placed before the examiners for evaluation.

Prof. Rajesh Kharat
(CHAIRPERSON)

Prof. Mahendra P. Lama
(SUPERVISOR)

Dedicated to my

MOTHER, FATHER

&

HUSBAND (VINAYAK)

For their immense love, support and encouragement

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CONTENTS

ABBREVIATIONS

- ADB Asian Development Bank
- ADF Augmented Dickey-Fuller
- AERB Atomic Energy Regulatory Board
- AFBS Accord on Fire and Building Safety
- ALO Alternative Livelihood Program
- ARDL Autoregressive Distributed Lag Approach
- ARTH Action Research and Training for Health
- BAPEX Bangladesh Petroleum Exploration and Production Company
- BELA Bangladesh Environment Lawyers Associations
- BEPZA Bangladesh Export Processing Zones Authority
- BERC Bangladesh Energy Regulatory Commission
- BGMEA Bangladesh Garment Manufacturers and Exports Association
- BIDS Bangladesh Institute of Development Studies
- BIISS Bangladesh Institute of International and Strategic Studies
- BMOGC Bangladesh Minerals, Oil and Gas Corporation
- BoI Board of Investment
- BOO Build-Operate-Own
- BPDB Bangladesh Power Development Board
- BSCIC Bangladesh Small and Cottage Industries Corporation
- BTMC Bangladesh Textile Mills Corporations
- CAGR Compound Annual growth rate
- CEPA Comprehensive Economic Cooperation Agreement
- CFTRI Central Food Technological Research Institute
- CLND Civil Liability for Nuclear Damages Act
- CMC Co-Management Committee
- CO_2 Carbon dioxide
- COD Chemical Oxygen Demand
- CPD Centre for Policy Dialogue
- CRISIL Credit Rating Information Services of India Limited

- CRZ Coastal Regulation Zone
- CSE Centre for Science and Environment
- DBCCI Dutch-Bangla Chamber of Commerce and Industry
- DCCI Dhaka Chamber of Commerce and Industry
- DCGI Drug Controller General of India
- DGCIS Department of Pharmaceuticals and the Directorate General of Commercial Intelligence and Statistics
- DIPP Department of Industrial Policy and Promotion
- DoE Department of Energy
- DoF Department of Forest
- DTA Double Taxation Agreement
- DTAA Double Taxation Avoidance Agreement
- ECA Environment Conservation Act
- ECR Environment Conservation Rules
- EIA Environmental Impact Assessment
- EKC Environment Kuznets Curve
- EPCT Engineering Planning Consulting Team
- EPW Economic and Political Weekly
- EPZ Export Processing Zones
- EQS Environmental Quality Standards
- ESAF Enhanced Structural Adjustment Facility
- ESCR-Net International Network for Economic, Social and Cultural Rights
- EU European Union
- EXIM Export Import Bank of Bangladesh
- FDA Food and drug Administration
- FDI Foreign Direct Investment
- FEMA Foreign Exchange Management Act
- FERA Foreign Exchange and Regulation Act
- FICCI Federation of Indian Chambers of Commerce and Industry
- FII Foreign institutional investments

- FIIA Foreign Investment Implementation Authority
- FIPB Foreign Investment Promotion Board
- FPI Foreign Portfolio Investment
- GATS General Agreement on Trade in Services
- GDP Gross Domestic Product
- GOI Government of India
- GSB Global Safety Board
- GSK GlaxoSmithKline
- GSP Generalized System of Preferences
- GST Goods and Services Tax
- HIV Human Immunodeficiency Virus
- HO Head Office
- IBEF India Brand Equity Foundation
- IBM International Business Machine
- ICAR Indian Council of Agricultural Research
- ICRIER Indian Council for Research on International Economic Relations
- ICSID International Centre for Settlement of Investment Disputes
- IDSA Institute for Defence Studies and Analyses
- IEE Initial Environmental Examination
- IEM Industrial Entrepreneur Memoranda
- IFC International Finance Corporation
- IGCC Indo-German Chamber of Commerce
- IHRC International Human Rights Clinic
- ILO International Labour Organization
- IMF International Monetary Fund
- IOCs International Oil Companies
- IPR Intellectual property rights
- IRG International Resource Group
- ISO International Standards Organization
- IUCN International Union for Conservation of Nature

- JVA Joint Venture Agreement
- KBCCI Korea Bangladesh Chamber of Commerce and Industry
- KKNPP Kudankulam Nuclear Power Plant
- KPMG Klynveld Peat Marwick Goerdeler.
- Kt Kilo Tonnes
- LCA Life Cycle Assessment
- LoB Limit of Benefit
- MDG Millennium Development Goals
- MFA Multi-Fibre Agreement
- MIC Methyl Isocyanate
- MICE Meetings, Incentives, Conferences and Exhibitions
- MMCFD Million Cubic Feet per Day
- MNC Multinational Corporation
- MoEF Ministry of Environment and Forests
- MoU Memorandum of Understanding
- MRTP Monopolies and Restrictive Trade Practices
- NBFC Non-Banking Finance Companies
- NBFI Non-Bank Financial Institution
- NEERI National Environmental Engineering Research Institute
- NGT National Green Tribunal
- NIPA National Investment Promotion Agency
- NPCIL Nuclear Power Corporation of India
- ODA Official Development Assistance
- OECD Organization for Economic Cooperation and Development
- OIC Organization of Islamic Cooperation
- PHH Pollution Havens Hypothesis
- PMANE People's Movement against Nuclear Energy
- POSCO Pohang Steel Company
- PSC Production Sharing Contract
- PWC PricewaterhouseCoopers

- PWR Pressurized Water Reactor
- R&D Research and Development
- RBI Reserve Bank of India
- RIP Revised Industrial Policy
- RMG Ready Made Garments
- SAARC South Asian Association for Regional Cooperation
- SEHD Society for Environment and Human Development
- SEZ Special Economic Zones
- SPCB State Pollution Control Board
- TERI The Energy and Resources Institute
- UAE United Arab Emirates
- UCC Union Carbide Corporation
- UK United Kingdom
- UNCTAD United Nations Conference on Trade and Development
- UNICEF United Nations Children's Fund
- UPA United Progressive Alliance
- UPPCB Uttar Pradesh Pollution Control Board
- USA United States of America
- USD US Dollar
- USAID United States Agency for International Development
- USEPA United States Environment Protection Agency
- USIL Union Carbide India Limited
- VAT Value-Added Tax
- VECM Vector Error Correction Model
- WB World Bank
- WITS World Integrated Trade Solution
- WPI Wholesale price index
- WTB Wildlife Trust of Bangladesh
- WTO World Trade Organization

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CHAPTER I

INTRODUCTION

I.1 Definition, Variety and Characteristic Features of FDI

Foreign investment is defined as capital flow from one country to another, granting stake ownership in the domestic company. There are four major varieties of international investment or capital flows. In the first place are the commercial loans, which are a funding arrangement (bank loans) between foreign businesses (and government) and a financial institution. These are used to fund operational and other capital costs of the company which are unaffordable otherwise. The second variety of foreign investment is official flows, which are a form of development assistance given by developed countries to developing countries. The third type is Foreign Portfolio Investment (FPI), which is an easily traded type of foreign investment through equity investments such as stocks (dividend, possible voting rights, hold a part in company) and bonds (debt and interest payments). This is a temporary investment not necessarily for long term interest, for which foreign company doesn't necessarily have to invest or gain a share in that company (Globalization 101: Investment). The fourth and the most popular type of foreign investment is Foreign Direct Investment (FDI), which is the main focus of this thesis.

"FDI refers to an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor" (International Monetary Fund 1993: 86). FDI is thus a non-debt capital derived from external sources and considered to be the leading source of external financing, transfer of technology, new business and competitiveness, training of manpower, market networking, and allows the international promotions of the host country's products (Ahmed 2010: 3). FDI is different from other types (foreign portfolio investment and international debt) of international capital flows due to its specific characteristics: In FDI, the investing entity keeps control over the operations, owns the equity and keeps control and command over technology and know-how. This particular characteristic of technology transfers and skills makes FDI a potent instrument of development for developing countries.

For developing countries that lack in capital formation and modern technology, FDI can become a major part of external stimulant (Rayhan 2009: 100). Host countries with (especially developing countries) the inflows of foreign investments achieve their socio-economic objectives such as sufficient domestic saving rates, growth and poverty reduction. FDI is seen as a major catalyst of economic growth and driver of international economic integration. Economic integration in the form of FDI gives opportunity to developing countries to make a move from domestic territory to international market. It increases the capacity to produce with the inflows of better technology, opportunity for joint-ventures, joint marketing arrangements, licensing and so on. (World Investment Report 2006: 15).

FDI has its special features, characteristics and variety that have made it a unique part of the globalization process and has enhanced its popularity across various countries. It has three components: first is equity capital, which is an enterprise of an entrepreneur in another country apart from its own. Second is the reinvested earnings which is the direct equity participation of an investor and the last component is the intra-company loans which is basically fund lending and borrowing for short/long runs between parent and affiliate enterprises (World Investment Report 2010: 104). FDI was introduced as key component of economic reforms by a majority of the countries including India and Bangladesh in the early 1990's. It soon became the most remarkable feature of globalization in South Asian countries as well. Keeping in mind FDI's importance in economic growth, India and Bangladesh have both tried to change the economic policies to attract investments. Earlier these two economies remained closed for many years after their independence. FDI was allowed only in a restrictive manner. There were multiple levels and types of restrictions. For instance, a majority stake was to be held by domestic firms even if it was an FDI triggered venture. FDI was allowed only in certain sectors and there were heavy taxations and duties coupled with lengthy approval process (Xiaolun 2002: 10).

This thesis focuses on various aspects of FDI and its changing patterns and impacts in India and Bangladesh since the adoption of economic reforms. This chapter is a detailed analysis of emergence of FDI in these two economies and its pattern in pre and

post reform era. Along with the pre and post FDI issues and trends, this chapter will also concern itself with an overview of the patterns, composition and direction of FDI in India and Bangladesh since the adoption of economic reform. The study of FDI primarily focuses on its interconnections and interfaces with the environment and society, which is the main crux of this thesis. The upcoming section deals with the research questions, hypotheses, data sources and methodology used to explore the interconnections and interfaces of FDI in this thesis.

I.2 Research Questions and Hypotheses

I.2 (i) Research Questions

There has been a constant discussion on whether FDI mostly emanating from developed market economies is good for the environment of the host country. The debate varies from technological issues to its impact to the environment, society, geography and community of the host country. Even after two decades, the debate and its related issues remain unresolved. The questions which are central to this thesis are:

- What are the sectoral patterns of FDI inflows in India and Bangladesh since 1991?
- What are the impacts of FDI inflows on environment in India and Bangladesh since 1991?
- What are the environmental issues that are affecting the FDI inflows in India and Bangladesh since 1991?
- What are the technological, professional and institutional challenges faced by these countries in managing the environmental impact of the Foreign Direct Investment?
- How have the communities, societies and geographies have reacted to the environmental impacts of the FDI?
- Are the environmental laws that are in place in these countries adequate enough to address the multifarious environmental impact of the FDI?
- What is the nature and extent of coordination among the institutions related to environment and FDI in these two countries?

- What are the policy issues for creating environmental friendly FDI inflows in both India and Bangladesh?
- Does Pollution Havens Hypothesis (PHH)[1] exist in India and Bangladesh due to inflow of FDI?

I.2 (ii) Hypotheses

These hypotheses that are posited here will help give clarity on the nature of FDI in India and Bangladesh, post liberalization. The following hypotheses will be tested in this thesis:

- Both, the polluting and the non-polluting sectors in India and Bangladesh have attracted steady flow of FDI despite a regulatory framework.
- Industries with severe environmental impact are located far away from public scrutiny.
- Technological backwardness in India and Bangladesh along with tilted technology transfer regimes at the global level, has made the environmental impact of FDI more damaging.
- The nature and degree of adverse environmental impact in India and Bangladesh varies with the origin, nature, response to and the standard of the FDI making companies.

I.3 Scope of Study, Data Sources and Research Methodology

I.3 (i) Scope and Importance of the study

FDI became an important tool of development in India and Bangladesh ever since their economic reforms. In recent times, developing countries, policy makers and multinational organization have understood the importance of focusing on FDI. The relationship and concept of FDI and environment are interrelated in a complex manner. Therefore, FDI is, on the one hand considered as a key to development for these two

[1] Pollution Havens Hypothesis (PHH) or Pollution Havens effects are the idea that pollution intensive industries are relocated to jurisdictions where environmental regulations are less stringent.

south Asian economies, while on the other it is said to deteriorate the environment and negatively impact the society and surrounding geography.

Currently there is no definite evidence to suggest which side of the argument on FDI holds true for India or Bangladesh. There is little empirical evidence on the environmental consequences of FDI inflows in India and Bangladesh. Therefore, this study is unique in its kind, as it sheds light on the theoretical underpinnings of FDI-environment relationships along with the set of empirical analysis. The empirical analysis helps in locating some of the intricacies and potential of FDI's impact on environment in India and Bangladesh. When FDI enters the territory of developing countries such as India and Bangladesh it creates a set of technological, professional and institutional challenges and therefore, managing the effects of these variables helps in formulation of policy recommendations.

I.3 (ii) Data Sources and Research Methodology

This study is based on empirical, comparative and case study methods. It involves both qualitative and quantitative analysis to provide a broader understanding of FDI inflows and its impact on environment in India and Bangladesh. A detailed case study from each country, involving field trips, was undertaken out by this author, to assess the impact on environment and society. For India, GlaxoSmithKline (GSK) a pharmaceutical foreign investment was studied while, in Bangladesh, Chevron Corporation (Gas Exploration Company) was selected for analysis. The main reason for selecting these particular foreign investments is the high quantum of FDI specific contribution of these two companies in India and Bangladesh respectively. The case study technique is based on field visit, primary and secondary data sources. The other method used in this thesis is empirical analysis, which tests the theory, helps in formulating the cause and effects relationship and helps assess the impact of FDI ventures on environmental sustainability. Concrete findings and policy formulations can be established with the above mentioned combination of case studies and empirical analysis. Lastly, a comparative analysis has also been conducted to see which of the two countries attracts better technology in the form of FDI.

The primary data sources include the information based on field visits, interviews, publications and data from GSK and Chevron Corporations. Some of the important primary Government data sources are reports and documents from India and Bangladesh like Reserve Bank of India (RBI), Economic Survey, Bangladesh Bank, Ministry of Commerce and Industry, Dhaka Chamber of Commerce and Industry (DCCI), Board of Investments (BoI), Ministry of Environment and Forests (MoEF), Petrobangla, Bangladesh Petroleum Exploration and Production Company (BAPEX), Department of Pharmaceuticals and The Directorate General of Commercial Intelligence and Statistics (DGCIS). Reports from international organizations such as World Bank (WB), Asian Development Bank (ADB), International Monetary Fund (IMF), United Nations Conference on Trade and Development (UNCTAD) and World Integrated Trade Solution (WITS) are critical in their contribution to this thesis.

Secondary sources used include books, journal articles, unpublished research documents and other relevant materials published from time to time. Few important sources are Centre for Policy Dialogue (CPD), Bangladesh Institute of Development Studies (BIDS), Bangladesh Institute of International and Strategic studies (BIISS), Dhaka and Jahangirnagar University, Society For Environment and Human Development (SEHD), Bangladesh Environment Lawyers Associations (BELA), India Brand Equity Foundation, GSK health care and CARE India. The unpublished research of Tanzimuddin Khan (Dhaka University), personal interviews and newspaper sources have played a crucial role in covering various aspects of GSK and Chevron. Newspaper and media sources such as Daily Star, Business Standard, The Hindu, Forbes and the Economist have also played an important role in the research. These newspapers have covered the case studies and important developments in FDI. Internet sources were also considered to be useful in this research for the procurement of secondary sources.

The sources mentioned above were utilized to meet different objectives of this thesis. The data collected for empirical analysis is analyzed systematically and in consistence with the rules and regulation of econometrics and statistics. For empirical analysis to see the effects of FDI on environment the variables defined are international trade (Exports

and imports), FDI, GDP (Gross Domestic Product), CO_2 (Carbon dioxide) and energy consumption. After studying a vast trove of literature over the theme, it has been found that the best econometric techniques to capture the long run relationship among these macroeconomic parameters are 'co-integration' and 'causality'. The empirical investigation, which uses E-Views software, follows a process to examine the time series properties of the data followed by co-integration test to check the unit root of the variables. Causality helps to infer the existence of a long run relationship amongst the variables.

I.4 FDI in India: Pre 1991 Survey and Issues

From independence (after 1947) onwards until 1991, India was afraid of foreign inflows and trade due to the exploitative history of Britishers in India. India had just come out of the shackles of a long British rule that was full of fear and distrust; hence an inward looking policy was enforced until 1991. India is a popular destination for FDI today, but it possessed a very restrictive attitude towards FDI till 1991. After independence, the main goal was to achieve self-sufficiency through economic planning and inward investment policy. The complex restrictive and constitutional policy of government towards FDI can be classified in three phases before economic reforms:

- ***The Phase of Cautious and Selective Attitude towards FDI (1948-1967)*:** As described previously, India followed an inward looking policy until 1991. The policy of putting trade restrictions was formulated to attain self-sufficiency. Towards this end, import substitution, 100% export promotion measures and technology imports were emphasized. The development model that India adopted was focused on import substitution model in its second five-year plan (1956-61). Till 1960, the legal and constitutional framework governing FDI was complex and unclear as it was designed to control domestic investment (Jalan 1991: 10). Only designated industries were allowed to bring in foreign investment to establish foreign enterprises through limited routes - joint ventures with domestic partners (Like Hero-Honda, Coca-Cola, IBM etc.), local content clauses, export obligations, areas of new technology and promotion of research and development (R&D).

There was no concrete policy because of the extensive control of the government on industries (Bhandari 2003: 126). This structure of economic planning was centralized, which created problems for policy makers to plan for. The government was focused on industrial development in the country and made industrial policy resolution in 1946 and 1956, which was popularly known as the 'economic constitution of India'. It laid down the basic framework of industrial policy and encouraged small-scale industries, restriction on foreign investment and encouraged the public sector's role. Till 1960's, the policy of investment remained closed because of the improving capacity of domestic industries as a result of the inward policy. Seeing the growth of economy, in 1961 the Indian Investment Centre was formed to shape, promote and control foreign investment. The attitude towards FDI became mild after the foreign exchange crisis of 1957-58 in which large amount of foreign exchange from India flew out because of factors such as profits, royalty and remittances of dividends and fees charged to investors (Malenbaum 1957: 841). All the above combined to create pressure on government to change its attitude and liberalize.

To summarize, the era of 1948-1967 was the beginning phase of the newly independent Indian economy, which created challenges for economic development because of a lack of consensus amongst policy makers on the adoption of a clear economic policy. This was further abetted by the lack of resources and poor state of domestic industries. Policy makers thus created a closed regime policy that looked inwards. India wanted to control the industrial undertaking it needed to go through and that is why under special cases it permitted and granted tax concessions and incentives.

- ***The Phase of Restrictive Attitude towards FDI (1968-1979)*:** During the 1970's, the restrictive attitude continued as the industrial licensing policy of 1970 gave priority to small scale industries and confined the restrictions on multinational companies (MNCs), heavy and export oriented sectors. The restriction was

imposed to enable the State to control various sectors of the economy and to protect the Indian industries from the threat of flight of foreign capital. The mid 1960's were a tough time for India as the northern part of India faced two droughts and famines in 1965 and 1966, foreign exchange crisis and an increase in defense expenditure due to wars with China and Pakistan.

India had to make huge payoffs to the IMF and World Bank for foreign aid taken during 1962-65. Hence, the industrial policy statement shifted its focus from small-scale industry to a heavy industrialization strategy and domestic consumptions goods sector (based on Mahalanobis model). The industrial policy of 1970 focused on selective liberalization, which was liberalization of the industrial sector to increase productivity and competitiveness within the confines of the MRTP Act[2] and the Patent Act of 1970 (Kapila 2008: 44). All foreign companies were controlled through these acts.

This policy was limited to foreign investment from consumer goods to capital goods to intermediate goods, but the industries were asked to use sophisticated technology. Furthermore, in 1974, FERA[3] was set up and all the foreign firms were forced to register in domestic market under Indian corporate legislation with up to 40% equity. FERA promoted domestic brands and prohibited the use of foreign ones (Hero-Honda, for instance). The restrictions of MRTP and FERA were imposed because of the insecurity that foreign products are superior and will thus pose a challenge to Indian industries that are less developed and not as efficient as the foreign companies (Nagraj 2003: 1706).

Another restrictive policy of the Industrial Policy Resolution (IPR) of 1973 was implemented to restrict the inflows of FDI to export oriented industries

[2] The Monopolies and Restrictive Trade Practices (MRTP) Act was formulated to deal with the monopolistic, restrictive and unfair trade practices to protect the interest of the consumer and to prevent the concentration of economic power in hands of few.

[3] Foreign Exchange and Regulation Act (FERA) was a legislation to impose strict regulation on foreign exchange (Forex), currency export and imports, certain kind of payments, securities and transactions. In 1999 FERA was replaced by FEMA (Foreign Exchange Management Act).

for the long term growth benefit of India. From 1970-1980, the Indian economy focused on economic liberalization and went through several policy changes under the regime of Prime Minister Indira Gandhi. In 1980's, an industrial policy with the focus on selective liberalization was initiated (Ibid: 95).

- ***The phase of pre-reform period (1980- 1991):***The Indian economy became marginalized in the world since its independence not only due to the slow growth, inefficient local industries and poverty but also due to excessive protection of the industries from international market, tight control over production and inward looking investment policies. During the early 1980's a severe macroeconomic crisis emerged mainly due to growth in public spending that increased budget deficit. By the end of the decade, the ratio between public debts to Gross National Product (GNP) had increased by 60%. This was mainly due to the failure of the public sector to generate profits, rise of foreign borrowing and the explosive growth of government spending (Kapila 2008: 45-46) .

Consequent upon the mounting public debt from IMF, substantial structural reforms that had been long overdue were initiated. The decade of 1980's was a turning point for FDI - moving from restrictive policies to reform policies in production and investment process. The Indian government slowly and gradually began to relax its foreign investment policy to earn foreign exchange; this required a number of joint ventures involving both financial and technical relationships. For example, Maruti's joint venture with Japan's Suzuki Motors in 1982, Pepsi's entry in post 1985, inflows from the computer industry and other such key industries were initiated (Wadhva 2000: 210-211).

The various measures taken by the Indian government included liberalization of foreign equity under FERA to 100% and greater autonomy to public sector. Other liberal measures were also introduced such as FDI in services; telecom and banking sector. The industrial policy of 1980 focused on technological upgradation, modernization of industries (this benefited automotive,

cement, cotton and food processing industries), FDI in exports sector and high technology areas. All the foreign investments were allowed under FERA on prior mandatory approval from the government. Such attempts were no doubt an encouragement for foreign investors but with all these restrictions, the environment remained unreceptive to foreign investments (Ahluwalia 2002: 67-70).

As may be noted, policies towards FDI did change in India over time since independence. FDI became an important tool for India to pay off the international debt, reduce scarcity of capital and resources and generate profit. Therefore, since the 1980s government started taking positive steps towards FDI inflows and liberalized a few policies; but the real thrust was given in the new industrial policy of 1991.

I.5 FDI in India: Post 1991 Survey and Issues

The policies of 1980s created industrial growth in the economy and climate for foreign investment, privatization and liberalizations. The government also realized the need for economic reforms to pull the economy out of the imposed restrictions and inward looking policies. In July 1991, a new industrial policy was announced with the objective of providing larger role to market forces for greater efficiency of the economy. The reform was based on the need to increase competition for domestic industries, to reduce government controls and to integrate the Indian economy with the world by removing the road bumps in trade, exchange rate, lowering tariffs and substantially relaxing regulations (Planning Commission 1991: 3-5). The policies in the 1990s, fostered industrial growth in the economy and provided a platform for foreign investments, privatization and liberalization. These policy changes made in 1991 were a watershed year for introduction of major structural reforms in Indian economy as enunciated below:

- India liberalized its trade policy regime under the WTO (World Trade Organization) agreement. Maximum FDI limit was raised to 100% in a number of

key industrial sectors such as telecommunications, transportation, power and infrastructure. Exceptions were made for industries related to national and social security.

- Establishment of Foreign Investment Promotion Board (FIPB) was completed with a view to bring transparency in the investment process. It was created as a single window FDI clearance agency.

- Technology transfer agreement was allowed under automatic route. Government allowed domestic firms to import better technology so as to improve efficiency and to have access to better technology.

- Department of Disinvestment was set up to make recommendations on phasing of disinvestment of government ownership of public sector units.

- The Government issued guidelines for investment in Indian capital market through foreign institutional investment (1992). To regulate the functioning of capital market SEBI (Security and Exchange Board of India) was formed.

- In 1993, financial sector reforms were taken by including private and foreign banks in the system and established Non-Banking Finance Companies (NBFCs) for promoting private functioning in the system.

- Exchange rate reforms were undertaken in August 1994; the partial convertibility of rupee on trading account was broadened to full convertibility on current account (Kapila 2009: 102-103).

Thus we see that the government, during the 90's, India had implemented comprehensive measures to hasten economic growth and development of the economy. These policies prepared Indian industries to become competitive and create a place for themselves in the emerging markets. Subsequent changes in

policies have been adopted to improve trade balance, investment structure and productivity of the economy. India reaped the benefits of reforms through increase in technological and managerial productivity (recorded at 8.5% in the seventh five year plan). The detailed analysis of FDI's patterns, composition and directions is presented in detail in the subsequent section of the chapter.

I.6 Quantum, Compositions and Directions of FDI in India post 1991[4]

This section of the chapter deals with the trends, composition and directions of FDI in India. This study is important to assess the changing patterns of FDI in India since the adoption of economic reforms and to study the growth of various sectors as a result of FDI. India receives FDI through two routes: One is automatic, in which foreign investments can enter the country without the prior approval of the government or. 100% FDI is allowed for majority of the sectors such as construction, food processing, textile except sectors involving security and exploration: banking, postal services, government and so on required prior government approval. Other way through which India received FDI is the Government route in which foreign investors cannot enter the economy without prior permission from state agencies like FIPB (Foreign Investment Promotion Board), Department of Economic Affairs and Ministry of Finance.

I.6 (i) Quantum of FDI Inflows in India Since 1991

There was a spurt in inflows during the liberalization of foreign investments in 1991 (Reserve Bank of India 2015: 1). The growth trends of FDI are shown in Table I.1 and the graphical presentation is shown in Appendix I (Figure I.1).

Table I.1 shows that FDI inflows increased since India adopted the policy of liberalization in 1991. Year 1991-92 recorded just $167 million in inflows for two reasons: first was that the economic reforms were opened in 1991 for the external sector and second was that the year 1990 witnessed an external payments crisis. The main reason of the crisis was the depleted exchange rate caused when the value of Rupee crashed against major foreign currencies.

[4] All Quantum, Compositions and Directions data of FDI are in US Dollars value.

Table I.1: Patterns of Foreign Direct Investment Inflows in India (1991-2014)

Years	FDI Inflows (In Million US$)	Compound Annual Growth Rate (%s)
1991-92	167	
1992-93	393	135.33%
1993-94	654	97.89%
1994-95	1,374	101.88%
1995-96	2,141	89.22%
1996-97	2,770	75.37%
1997-98	3,682	67.45%
1998-99	3,083	51.67%
1999-00	2,439	39.82%
2000-01	2,908	37.36%
2001-02	4,222	38.13%
2002-03	3,134	30.55%
2003-04	2,634	25.84%
2004-05	3,754	27.05%
2005-06	5,546	28.43%
2006-07	15,726	35.39%
2007-08	24,579	36.61%
2008-09	27,309	34.96%
2009-10	22,461	31.30%
2010-11	14,939	26.68%
2011-12	23,473	28.05%
2012-13	18,286	25.06%
2013-14	16,054	23.06%

Source: Department of Industrial Policy and Promotions, Government of India.

In mid-eighties, balance of payment problem arose due to gulf war, rise in oil import bills, decline in exports which further adversely affected the macroeconomic balances such as fiscal deficits, revenue deficit (Revenue receipts were less than Revenue expenditure) and low foreign reserves (Planning Commission 2002: 10). Authorities of the Reserve Bank of India decided to borrow money from IMF and adopted various structural reforms like accelerating the process of industrial and import delicensing to recover from the crisis. The idea behind industrial licensing and import delicensing was to control the entry of new firms and businesses in India. India's strategy of liberalization was to focus initially on the growth of industrial exports and then shift to trade

liberalization, capital inflows, financial sector reform, tax reforms and instituting an appropriate exchange regime (IMF 2012: 7).

The reforms process took two years for the government to implement meaningfully due to which FDI inflows remained slow in years 1992-93 and 1993-94 ($394 million and $654 million). The measures taken by Manmohan Singh, the then Finance Minister, during the period from 1991-1995 included reduction in food and fertilizers subsidies and reduction of public expenditure. These measures helped to reduce the fiscal deficit and to increase FDI inflows to $1,374 million in 1994-95. During 1996-97, India liberalized the foreign investment policy and recorded investments at $2,770 million and the Compound Annual growth rate (CAGR) was recorded at 75.37%. Such a huge hike was possible due to the allowance of foreign investment up to 74% in industries by the Government of India, which increased the domestic market size and gave incentives to investors. Japanese and Chinese investments increased rapidly during that time in India; collaboration of Suzuki Motor Corporation and Maruti was a perfect example of that. For subsequent years, the increasing trend of FDI is visible in Table I.1 which recorded an increased FDI inflow in 1997- 98 ($3,682 million) and 1998-99 ($3,083 million). During the same period, the foreign trade component (exports) and the GDP grew substantially (8.3% GDP in 1997-98), which further increased FDI inflows into the country. The Indian government also allowed 100% FDI in cash and carry wholesale which further encouraged investors.

The government in the Annual Budget of 1999-2000 brought forward several measures to encourage FDI inflows such as automatic clearance for foreign participation within 30 days, creation of Foreign Investment Implementation Authority (FIIA) and allowed NRIs to invest up to 100% for all items except those reserved for small scale industry sector and enacted Foreign Exchange Management Act (FEMA) in 1999 by replacing the less stringent FERA of 1973 (Chakravarthy 2005: 63). Such measures boosted FDI inflows to $2,439 million in 1999-2000 and $2,908 million in 2000-01 with an annual growth rate of 37.36%.The increase in growth of FDI due to the government reforms brought in foreign investments through automatic route and resulted in 100% FDI in oil refining, E-commerce, aviation, courier services, hotels, tourism, drugs,

pharmaceuticals and telecom sector. The ceiling for FDI in insurance sector was extended to 26% and 74% for public sector banks. In 2005 SEZ (Special Economic Zones) Act was enacted to boost the level of investment and investors' confidence (Raju 2010: 116). As a result, the inflow increased from $4,222 million in 2001-02 and to $5,546 million in 2005-06 (28.43%).

In 2006, 49 % FDI was permitted in hardware, up-linking hub, construction and township development. The government also allowed FDI up to 51% with prior approval in retail sector. FDI was allowed in single brand products till 2012 with the aim to attract investment in production, consumer goods, encouragement for sourcing goods, thus enhancing competition between Indian enterprises and global firms. Government allowed 100% FDI through automatic route in manufacturing of industrial explosive, hazardous chemicals, distillation and brewing potable alcohol, petroleum and natural gas investment and wholesale trading and export trading (Ministry of Commerce and Industry 2001: 72). The result of such amendments in FDI policies increased FDI to a five digit figure ($15,726 million) in 2006-07 which doubled in 2008-09 ($27,309 million). The CAGR was recorded 34.96% between 2003 and 2007.

The FDI policy, that evolved over time helped in cross-border trade and inflows until the global financial crisis of 2008-09, which reduced the quality and quantity of FDI in the world (RBI 2014: 3). The roots of the economic slowdown emerged in USA in 2007 due to poor functioning of credit and lending market (Lehman Brothers) which created the largest bankruptcy in history of USA and instigated global financial crisis in last quarter of 2008 and early 2009. This resulted in global economic slowdown, negative balance of payment and contraction in FDI. India like other countries of the world was affected by the global meltdown because of the withdrawal of capital from India's financial markets by the foreign investors due to squeeze in the global liquidity. The damage started impacting banking and financial sectors due to drying up of overseas financing (Ministry of Commerce and Industry 2012: 1-2). India had to depend on domestic banking sector for credit demand, which created pressure on the domestic money and credit market. To manage this reversal of capital flows, which created pressure on Rupee, the RBI intervened in the foreign exchange market to manage and

tighten the liquidity of the rupee. The effects of crisis on the economy tightened the FDI inflows and resulted in a decline in 2010-11 to $14,939 million from $22,461 million in 2009-10; CAGR was recorded at 26.68%.

The policy stance and economic fundamental changes adopted by RBI to deal with the slowdown drove the steep rise in FDI inflows. India managed itself well during the crisis and remained the second fastest growing economy during that time after China. One of the reasons of India's survival during the crisis was the low dependency on housing and real estate sector as compared to developed countries such as USA, Europe and Japan. Home mortgage is not a very crucial part of India's domestic economy. Moreover, the RBI tightened the loan lending policy, bought mortgage back securities, ordered banks to stop taking deposits for speculative activities. Apart from these monetary measures, fiscal policies like lowering interest rates and excise duty to attract external sectors and expanded credits were introduced. These monetary and financial regulatory measures by RBI reduced the prolonged effects on FDI (Bajpai et al. 2004: 1-5). This led investors to return to Indian market and FDI increased in the year 2011-12 to a massive $23,473 million.

As a response to the crisis, India adopted measures such as introducing limited liability partnership, and pausing reforms that would have caused investors to exit. Even then, the inflows declined in the year 2012-13 ($18,286 million) and 2013-14 ($16,054 million); the CAGR in 2013-14 was recorded at 23.06%. To deal with this slow-down, the Government, in the late 2012, further modified the reforms to encourage FDI such as the opening up of aviation sector (to some extent), increasing FDI to 100% in single brand retailing and 51% in multiple brands retailing, which again helped in making the investment environment more conducive in India (Ahluwalia 2011: 7).

The graphical presentation of the FDI inflows is given in Figure I.1 of the Appendix I and the patterns reveal some volatility in 1991-92; this was due to the major structural reforms, exchange rate policy change and liberalization of the international trade policies. The foreign direct investments saw increasing trends till 1997-98 and the

next two subsequent years showed declining trends. After year 2000-01, the graph shows the rising trends till 2008-09. The economic recession caused a slump in the inflows and the post recovery ups and downs of FDI are also very clear from the figure till 2013-14. These divergent trends in FDI flows are the result of certain institutional factors that dampened the investor's sentiments (Baral 2013: 26-30).

I.6 (ii) Compositions of FDI Inflows in India Since 1991

To understand the structure of FDI in India, it is important to study the sectoral composition since 1991. For that purpose, the analysis is divided into two time periods: 1991-2006 and 2006-2014. The reason for the two time period is that during 1991-2006, automobile and hotel tourism sectors were not in the list of top ten FDI inflows while during 2006-2014 they were amongst the top ten FDI attracting sectors. These two industries occupied the place of food processing sector and cement industry. Therefore, it is important to analyse the shuffling of the top ten sectors since the reforms. Table I.2 below is calculated on the basis of data received from the Department of Industrial Policy and Promotions, Government of India. The graphical presentations (Pie Diagrams) of the sector wise share of FDI are depicted in pie diagram of I.2 (1991-2006) and I.3 (2006-2014) in Appendix I based on the data obtained from the same source.

Table I.2: Compositions of FDI Inflows in India (1991-2014)[5]

Sectors	Cumulative FDI Inflows in Million US$ (1991-2006)	Percentages Share of Sectors (1991-2006)	Cumulative Inflows in Million US$ (2006-2014)	Percentages Share of Sectors (2006- 2014)
Services Sector (Financial & Non-Financial)	3,091	7.95	29,700	18.24
Electrical Equipment (Including Computer Software, Hardware & Electronics)	5,496	14.12	8,635	5.30
Telecommunications (Radio Paging, Cellular Mobile, Basic Telephone Services)	3,372	8.67	10,802	6.63
Transportation Industry	3,178	8.17	1,498	0.92
Fuels (Power + Oil Refinery+ Gas)	2,581	6.63	8,769	5.39
Chemicals (Other than Fertilizers)	2,143	5.51	10,369	6.37
Food Processing Industries	1,179	3.03	NA	NA
Drugs & Pharmaceuticals	1,007	2.59	1,760	1.08
Cement and Gypsum Products	747	1.92	NA	NA
Metallurgical Industries	655	1.68	5,295	3.25
Automobile industry	NA	NA	7,463	4.58
Hotel & Tourism	NA	NA	5,627	3.46

(Source: Authors calculations based on the data from Department of Industrial Policy and Promotions, Government of India.)

From the time the economic reforms were kicked off in 1991 to 2006, the *Electrical Equipment* sector received the maximum FDI; this sector includes Computer Software, Hardware and Electronics. The cumulative FDI inflows were recorded at $5,496 million USD. (14.12% share) during 1991-2006. The reason for such high growth in this sector was that till 2003, the computer software and hardware sector was clubbed with the electrical sector and not calculated independently. Other reasons that boosted FDI inflows in this sector were changes in regulatory reforms from Government such as the establishment of software technology parks, steep reduction in the custom duties on capital goods, reduction in excise duty, the growing Indian market and availability of skilled work forces. Bringing FDI was a profitable option for this sector because India was missing capital and latest technology within the domestic territory of the country.

[5] NA here means Not Applicable.

During 2006-2014, this sector accounted for the growth of only $8635 million (5.30% share) and slipped to fifth in the list because the computer hardware and software industry had been excluded from the electrical sector. Though the inflows increased in this sector due to 100% FDI permitted under automatic route, the overall share of inflow slipped. This sector retained its importance and growth due to increasing consumerism and demand for electronic goods and loosening of restrictions on this sector (Economic Survey 2008-09: 49-50).

The *Service Sector* (Financial and Non-Financial Services) grew phenomenally since the beginning of the reforms in India. It was positioned at number four with inflows of $3,091 million (13%) during 1991-2006 and rose tremendously to $29,700 million (33%) to become the most popular for FDI inflows in the list of top ten. In one financial year alone (2006), this sector recorded inflows of $4,664 million. The increase in growth of this sector had increased the share of services in FDI and GDP of India. The foremost reason for this growth was India's shift from agriculture to services sector. (Bhattacharaya and Mitra 1990:3). From independence till the 90's, India was primarily an agrarian economy; in the mid 80's the service sector began to grow and by the beginning of the 90's it started accelerating and attracted significant overseas interest. Another reason for this shift was the high income elasticity of demand for services i.e., the increasing population and its increasing demands for services such as tourism, shipping, banking, financial services, road transports, IT services, e-commerce, consulting, construction, trade, postal and courier services, energy services etc.

At present, except postal services and railways, FDI is allowed in most of the services sector (Mukherjee 2013: 18). Government realized the importance of service sector since the share of agriculture fell from 55% (1950-51) to less than 18% (2007-08), and services industry replaced the agriculture sector. (ICRIER 2010: 2). Upon realizing this, the Government adopted significant steps such as liberalization of its visa regime, including allowing multiple-entry tourist and business visas, low rate of goods and service tax (GST), tax benefits and acceptance of international credit cards. Thus the growth and excessive employment generation capacity further raised investment in this sector over the years and contributed significantly to India's GDP. According to

UNCTAD 2007 Report, the services sector placed the Indian economy on a golden path. Statistically the Indian service sector grew at approximately 8 per cent per annum and contributed to about 64 per cent of India's GDP in fiscal year 2015-16 (IBEF 2016: 1).

Telecommunication sector was always second in the list of top ten FDI with inflows of $3,372 million (8.6% Share) during 1991-2006 which increased cumulatively to $10,802 million during 2006-2014. This sector consists of radio paging, cellular mobile and basic telephone service and allows for 100% FDI. Before the economic reforms, this sector was under public sector control, however, with the new policy regimes, the Government of India liberalized policies for power and telecommunications sector as well, which resulted in increased inflows of foreign investments. The government eased access to telecom equipment, reduced protection and ensured a fair and proactive regulatory framework that promised better services to consumers at affordable prices. This deregulation increased the inflows along with employment opportunities to the people and hence made it one of the fastest growing FDI sectors; rapid development and strong consumer demand encouraged international players to invest in India in the form of transfers of advance technologies (Rao 1999: 429). Telecommunications has been the fastest growing sector because of not only its efficient technological skilled force and the high demand but also the low cost products, efficient mobile handset manufacturing opportunity, huge population, consumer goods oriented market, growth in hardware technology, exemption of duties and taxes and setting up special economic zones (SEZ) for large scale manufacturing (Pichumani 2014: 873). FDI opportunities in the telecommunication sector are mainly in the areas of E-commerce, Manufacturing, Tele-education, Tele banking, Exports of telecom equipment and services, Telemedicine and setting up a national long distance bandwidth capacity in the country (Chaturvedi 2011: 528).

The other sector which attracted FDI during 1991-2006 was *Transportation sector* with cumulative FDI inflows of $3,178 million (14% share). For trade and investment encouragement, development of infrastructure sector is crucial for the effective adoption of economic reforms and that is why the Government focused on the various forms of transportation such as road, ports, airports and railways. Among these four, 100% FDI

was allowed only in the road sector, which saw foreign companies and Indian private players (GMR, Port of Singapore Authority (PSA), Jindals GVK, Eredene Infrastructure, Reliance group, Aditya Birla group, APL, IsoluxCorsán, Larsen & Toubro etc.) forming consortiums with each other investment (CRISIL 2014: 1). Realizing the importance of this sector Government provided several incentives such as land rights, easier external commercial borrowing norms, shifting of utilities, environment clearance, tax concessions, duty free import of high capacity, strong dispute resolution mechanism, robust institutional and legal establishment help for investors and rights to retain toll which helped maintain the importance of the transportation sector and retain it in the list of top ten FDI sectors (National Investment Promotion Agency 2012: 1).

But the transportation sector was not able to maintain its position for a long as government control of the aviation and railways sector hampered relative growth of inflows. This resulted in lower FDI during 2006-2014 with inflows of only $1,498 million (2%) as a consequence of which, transportation sector slipped to tenth position in the list. The fact that India had inadequate capacity in sea ports and airports was compounded because of poor interconnectivity (World Bank 2014: 1). These restrictions proved detrimental to realizing the potential of this very crucial sector. Hence in 2012, UPA government permitted 49% FDI in aviation sector which was further increased to 100% in 2016 in an effort to give it the necessary fillip. Out of this, 49% will be through automatic route and for the rest government's prior approval was made mandatory (Economic Times: 21 June 2016). This helped enhance development, employment, revenue and overall growth. Further growth can also be expected in this sector once the railways is opened up for FDI.

The *Fuel sector* (Power, Oil Refinery and Natural Gas) stood fifth during 1991-2006 with inflows of $2,581 million (11%) and moved to fourth position with inflows increasing to $8,769 million (10%) during 2006-2014. FDI in power sector was and continues to be the most primary demand of a hungry economy. Therefore, important initiatives are being taken by the Indian Government to drive FDI inflows specifically towards this sector. With a growing population, huge market size, high investment

returns and the demand for fuels, ever more investment inflows are required in India (Raja and Akilandeswari 2012: 4). Government has allowed 100% FDI in power generation under automatic route in categories such as Non-conventional energy, Generation and transmission of electric energy produced from hydro-electric, coal, lignite, oil and gas-based thermal power plants, power trading, household, industrial and commercial distribution of energy. FDI in atomic energy is however prohibited.

Ever since the economic reforms geared up, in the year 2000, industrial activities have increased. Correspondingly, the increase in investment across the value chain has resulted in increased inflows of FDIs in India's power sector for the power generation, transmission & distribution, power trading and power exchanges (DIPP 2015: 1-2). Foreign giants such as Mitsubishi Heavy Industries Ltd. (Japan), Toshiba (Japan), Babcock & Wilcox (USA), Doosan (Korea), Ansaldo Caldie (Italy) and many more have started investing in India (Indian Power Sector 2012: 1). The FDI in power sector helps satisfy the demand for electricity consumption, enhances public-private partnership and helps invent modern and alternative ways of power generations such as wind, solar and hydro energy.

The *Chemical Industry* of India is an important sector which has attracted FDI since 1991. It was sixth in the list with FDI inflows of $2,143 million (9%) during 1991-2006. The sector then moved up to third place with inflows of $10,369 million (11%) during 2006-2014. The popularity of chemical industry grew with growing urbanization, end consumption demand for paints, textiles, adhesives and construction activities in this particular industry. Factors such as high domestic consumption, increasing demand in the world market and immense export potential also helped in its rapid growth. Seeing the increasing importance of this over the years since economic reforms, 100% FDI was allowed through the automatic route subject to all the applicable regulations and laws except, hazardous chemical, which still needs prior approval (India Brand Equity Foundations 2015: 1). Government has given many incentives such as tax concessions, increased clustering, and a plan to set up chemical parks in SEZs. Major foreign companies such as Dow Chemical (USA), BASF (Germany), ADEKA and Mitsubishi

Chemical Corporation (Japan) and Rhodla (Belgium) have invested in India in this sector. The countries with largest investments in this sector are Germany and Japan, USA, Belgium followed by others ((DIPP 2015: 1). These incentives, investments and quantum of inflows help the development, expansion, and growth of this industry in India. This in turn has led to the improvement in the quality of the products from the industry. According to NIPA (2012) India is now the third largest producer in Asia, 8th in World and 4th largest in agro based chemical production.

Another important area for foreign investment during 1991-2006 was *Food Processing Sector,* which stood at 7th place with cumulative inflows of $1,179 Million USD (5%). However, from 2006 onwards, it was unable to retain its place in top ten sectors. Since 1991, foreign companies dominated the food-processing sector (Coca-Cola, Pepsi, Kellogg, Heinz, Seagram etc.) in India. Government had permitted 100% FDI under automatic and approval route (for trading, e-commerce in respect of food products manufactured and/or produced in India). Being an agrarian economy, since 1991 this sector attracted FDI and was dependent on imports of goods and services. This in turn helped develop the backend infrastructure such as transfer of modern farming technology, agricultural mechanization and marketing (DIPP 2015: 1-4). The major limitation, was the tight control of the Government on agricultural products, which was used to regulate this sector. Further FDI was allowed only in the backend development, which was not enough to ensure the food processing industry's place in the competitive FDI sector list. It therefore lost its spot in the list of top 10 most attractive FDI sectors. Regardless of such restrictions, a number of consumer goods companies today, are setting up subsidiaries and holding companies that have the potential to influence the market (Rao et al. 1999: 430). In 2016, the government allowed enhancing the FDI inflows in retail sector and a 100% FDI in marketing and production of food products. This helped farmers to get better price for their production, improve the backend infrastructure, allow direct purchase by the retailers and develop efficient supply chain mechanisms which reduces food wastage, lower inflation and curb interest rates (The Economic Times: 31 May 2016).

Drugs and Pharmaceuticals were eighth in the list during 1991-2006 with inflows of $1,007 million (4%) which increased to $1,760 million (2%) during 2006-14, slipping to ninth in the list. Pharmaceutical sector has been an important sector since economic reforms as India has always had a high trade volume of pharmaceutical products. Initially, FDI in pharmaceuticals was not allowed because India was not granting intellectual property rights to foreign firms. This was because it was more dependent on production and trade rather than investment (Bergman 2006: 24). In 2005, an amendment was enacted which led to a major step in creation of the Department of Pharmaceutical in 2008 with a vision to make India the largest global market of medicine at reasonable prices. Hence in 2014, 100% FDI was allowed under the automatic route for Greenfield investment[6]. The cap of 74% is still applicable under laws and regulations of Foreign Investment Promotion Board. To encourage investment, incentives such as patent regimes, clinical trials, R&D and manufacturing were provided to pharmaceutical multinationals to invest in India (Kalotra 2014: 4). Notwithstanding all the administrative hurdles and restrictions this had sector faced, it managed to perform rather well to maintain it place in the list of top ten sectors consistently since 1991.[7]

The *Cement and Gypsum sector* was one of the top ten sectors during 1991 to 2006 with FDI inflows of $747 million (3% Share). Cement sector is one of the vital sectors that offer employment to huge population. In 2016, India was the second largest producer in the world. This sector rode on the growth of infrastructural projects and played a key enabling role as a result of which, the government allowed a 100% FDI in it. To help this sector grow the Government invited foreign players such as Holcim, Heidelberg, Italcementi, Lafarge and so on (IBEF 2016: 2-3). The importance of this sector remained high after the mergers between Indian giants and these foreign cement manufacturers. Sensing immense potential domestically, Indian companies too have emerged as international players over the years. Thus we observe that while investment inflows have increased, outflows too have increased. Indian cement giants like Ultratech

[6] Greenfield investment is an investment where parent company builds its builds a new venture in host country including new facilities like production, offices and distribution hubs.
[7] Detailed analysis on FDI in pharmaceuticals is discussed in Chapter IV, Section IV.5.

Cements, JSW Cements, Birla Cements, Dalmia Cements are some of the major players with investments abroad (Ministry of External Affairs 2016: 2-3).

Tenth in the list was the *Metallurgical Industry* with FDI inflows of $655 million (3% Share) between 1991 and 2006. It has upgraded its position to 8th with FDI inflows of $5,295 million (3.2% Share). After 1991, this sector slowly and gradually became less noticeable because of development of advanced and technologically equipped metallurgical services within the country. In spite of its small share, it continues to remain in the list of top ten sectors list during 2006-14. FDI in this sector brought in the latest technology and helped expand the industry. This sector plays an important role, yet saw low FDI inflows because of the dominance of public sector in this field, resource abundance and technological advances made by companies in India (Gupta 2013: 11). The Government provides constant encouragement and incentives to this sector thus maintaining its relevance as one of the important FDI attracting sectors.

Two new sectors that have made their place in the list of top ten sectors during 2006-2014 are the *Automobile Sector* with inflows of $7,463 million (8%) and the *Hotel and Tourism sector* with FDI inflows of $5,627 million (6%). These two sectors were not in the list during 1991-2006, and only became important later, ranking at 6th and 7th respectively. The profit generating hotel and tourism industry owes its phenomenal rise to the spurt in arrival of global tourists. This sector started attracting FDI after 2009 with an amount of $671 million inflows. Seeing the huge potential of this sector to generate revenue the Government permitted 100% FDI through automatic route. This encouraged the industry to offer attractive incentives to foreign companies to invest in tourism sector of India by way of opening of travel agencies, units providing facilities for cultural, adventure and wildlife tourism, surface, air and water transport facilities for tourists, and convention/seminar units and organizations) This created employment to millions and provided a boost to the economy (National Investment Promotion Agency 2012: 2-3). Government also provided various incentives such as tax holidays[8], Visa on arrival facilities to tourists from countries like Finland, Japan, Luxembourg, New Zealand and

[8] Tax Holiday is elimination of tax temporary to encourage business and investment.

Singapore; several schemes to promote rural tourism and infrastructure under heritage tourism have since been started. The tourism and hospitality sector encourage inbound and outbound tourism and for that purpose they run promotion campaigns such as Incredible India, Colors of India and Atithi Devo Bhavah, meetings, incentives, conferences and exhibitions (MICE) and eco-tourism programs. Foreign investors like Lemon Tree Hotels, Intercontinental Hotel Group, Holiday Inn Express, Marriott Hotel, Thomas Cook (Tour operators) set up business in quick time, MakeMyTrip and many more indigenous start-ups entered the Indian market with investments in this sector (IBEF 2016: 1).

Similarly, *Automobile sector* became popular from 2006 onwards with inflows of $7,463 million (4.58%). Increasing disposable income in the hands of its citizen, increased exposure to lifestyle abroad amongst the professionals, particularly from the IT industry, created an unprecedented surge in demand for the latest passenger cars and motor vehicles. 100% FDI was allowed under automatic route subject to all applicable regulations and laws. This made the country a prime investment destination in Asia. India ensured numerous advantages to the investors in automobile technology, including establishment of research and development (R&D) centers for automobile testing and cost effectiveness. Further, various finance schemes were introduced like easy repayment schemes adding to the list of incentives. Earlier only few companies were allowed to merge with the Indian automobiles companies like in the case of Suzuki from Japan with Maruti in 1980. Currently multiple players are operating in India to manufacture low cost electric vehicles, light commercial vehicles, two wheelers and three wheeler (Make in India 2016: 1-2). India is now poised to grow the fastest by volume in the world; becoming a hub of research and development and a large automotive cluster. Japan, U.S.A, Netherlands, Italy, Sweden and Mauritius are amongst the leading countries investing in the automobile sector in India. The top manufacturers of the world such as Honda, Toyota, and Ford contribute a significant share in investment, manufacturing and exports (Agarwal 2015: 40).

I.6 (iii) Directions of FDI Inflows in India Since 1991

The top ten investing countries are taken into consideration for directional analysis of FDI inflows in India. Similar to the previous section, (Compositions of FDI) the time period is divided into two i.e. the period from 1991 to March 2005 and from April 2005 to 2014. This has been done because from 2005 onwards Cyprus and UAE joined as amongst the top ten investor nations replacing South Korea and Switzerland who ranked in the list till 2005. Table: I.3 below shows the direction of FDI inflows during both the time periods. The pictorial presentation (Pie Diagrams) depicting the percentage share of these countries in total FDI inflows is given in Appendix I (Figure I.4 and I.5).

Table I.3: Directions of Foreign Direct Investment in India (1991-2014)

Country	Cumulative Inflows In Million US$ (1991-March 2005)	%age inflow (1991-2005)	Cumulative Inflows in Million US$ (April 2005-2014)	%age with inflow (April 2005-14)	Cumulative Inflows in US$ (1991- 2014)
Mauritius	9215	27.63	68060	40.42	119872.63
U.S.A.	4536	13.60	9283	5.51	18368.60
U.K.	1714	5.14	14550	8.64	17983.14
Japan	1915	5.74	8948	5.31	12783.74
Netherlands	1918	5.75	7675	4.56	11516.75
Germany	1278	3.83	5581	3.31	8140.83
Singapore	774	2.32	16721	9.93	18271.32
France	759	2.28	3401	2.02	4921.28
South Korea	692	2.07	994	0.59	2380.07
Switzerland	540	1.62	1204	0.72	2285.62
Cyprus	NA	NA	7423	4.41	7423.00
UAE	NA	NA	2386	1.42	2386.00

(Source: Authors calculations based on the data from Department of Industrial Policy and Promotions, Government of India)

Mauritius has always been a top source of FDI in India since 1991. Since the adoption of liberalization, India enhanced its trade relationship with rich, friendly countries such as Mauritius. To strengthen trade and investment relationship India and Mauritius signed the treaty of double taxation avoidance agreement (DTAA). This was done to avoid the incidence of double taxation, promote trade and investment among the two and prevent the two economies from fiscal evasion. This treaty has helped the Indian

investors to expand business in other African countries with which Mauritius has preferential agreement on tariffs and trade (Desai and Sanghavi 2012: 2). This treaty resulted in an increase in FDI inflows from $9,215 million during 1991-2005 (40%) and $68,060 million (47%) from April 2005-2014. The agreement of DTAA helps the investing countries to channelize their investment via Mauritius to get tax benefits; the main reason why the majority of USA's investments in India are being routed through Mauritius. The DTAA between Mauritius and India reduces the tax rate by 5% while entering India (Dasgupta et al. 2004: 6). The multinationals are taking full advantage of this treaty and setting up a dummy company in Mauritius and investing via Mauritius in India (Rajan 2008: 9) making Mauritius a strong FDI partner of India.

The dominance of *United Kingdom* (UK) continued even after 1948 in India and till that time, three-quarters of total foreign assets and capital belonged to Britain (Bhati 2006: 119). Due to historical ties with Britain, India still retains a lot of the cultural legacy from the pre-independence era. The two have thus been natural partners in trade and investment. India is seen by Britain as a growing South Asian economy with immense potential with its growing purchasing power, huge size of the domestic market and educated workforce; all factors that have combined to retained the investment of Britain in India (Confederation of British Industry 2015: 6). UK was the fifth largest investor in India with an inflow of $1,714 million (7%) during 1991-2005. During 2005-14, UK upgraded its rank to third with inflows of $14,550 million (10%). While UK plays a crucial role in Indian investment market, the latter also happens to be an integral part of in the UK market, which made India the third largest source of FDI in UK during 2015 (The Economic Time 2016: Foreign Trade Section). This mutual bilateral trade and investment between the two are strong and both countries come together often to maximize the potential of trade and investment even further (Athreye 1999: 10).

FDI inflows from *USA (United States of America)* play a crucial role in India and vice versa. As mentioned previously, the majority of USA's FDI in India is channelized through Mauritius because of the double tax exemptions. The investment was recorded at $4,536 million (20%) during 1991-2005, which made USA the second largest investor in

India. However, USA slipped to fourth place during 2005-14 with the inflows of $9,283 million (7%). Still USA is one of the fastest growing investor in India for various reasons such as the fact that majority of MNCs and TNCs globally, are based out of USA, from where they extend their investment in India (Chalapati et al. 1997: 425). The availability of potential IT workforce and a stable financial sector of India also helped attract FDI from USA (Beena 2004: 137).The FDI from USA to India has seen its ups and but has remained in the list of top five in India.

Singapore was investing a mere $774 million (3%) during 1991-2005 and stood seventh in the list of investors during that time. The Double tax treaty between India and Singapore made Singapore the second highest FDI after Mauritius during 2005-2014 with the inflows of $16,721 million (12%). Though the treaty was signed many years ago, the real impact on FDI inflows only began when the amendment of Limit of Benefit (LoB) was included. According to this clause, the tax treaty can only be claimed when a company has an annual expenditure of $2,00,000 for at least two years operating in Singapore. This increased Singapore's investment in India as it gave substance and certainty to investors based in Singapore and ultimately to rise in capital gains. The sectors which attract maximum FDI from Singapore are Computer software, hardware, and trading, various services, automobile and telecom sector (The Hindu 2015: Business Section). LoB clause has made Singapore an attractive FDI investor in India as mentioned in the DIPP data for 2013-14 which shows that India has received $5.98 billion FDI from Singapore and $4.85 billion from Mauritius, thereby displacing Mauritius from the top spot in the top ten list (DIPP 2014: 2).

Culture and civilization have been the basis of friendship between India and *Japan* from a very long time. Bilateral trade and investment ties between the two countries are expanding by the day, with India becoming one of the most favorite destination for investment by Japan in Asia (Embassy of India, Tokyo 2014: 1). Japan was placed in fourth position during 1991-2005 with the cumulative FDI inflows of $1,915 million (8%) which further recorded $8,948 million (6%) during 2005-14. The expanding FDI inflows statistics clearly show that Indian market is very crucial for the

Japanese economy. This is because the growing structure of Indian economy and stable investment environment offers Japanese companies large amount of investment opportunities in India. Further, the huge demand and market for Japanese automobiles in India with the increasing population motivates Japan to invest here. Automobile sector is the most important sector of Japanese FDI in India followed by electronic equipment, telecommunications, pharmaceutical industry and chemical sector. Both the countries have signed the Official Development Assistance (ODA) plan to assist each other. Similarly, Comprehensive Economic Partnership Agreement (CEPA) was signed in 2004 to deepen the economic collaborations like trade of goods and services, mutual prosperity and investment (Government of India Report, 2016:1). The Indian market is growing year by year and is now attracting Japan to invest in other sectors such as India's power infrastructure (Ibid 2015: 3-4).

Netherlands, the seventh largest country of European Union, with a large potential in the external sector, business friendly climate and its location is a gateway to Europe. The India-Netherlands relationship is based on technical, educational, cultural, economic and commercial cooperation since ages (Ministry of External Affairs, India 1947: 4). This resulted in an important role of FDI inflows in India during 1991-2005 when it was recorded $1,918 million (8%) and $7,675 million (5%) during 2005-14. The famous Dutch MNCs like Phillips, Shell, Unilever Ltd, and KLM, along with the big banks like ING and Rabo bank are significantly expanding in the Indian marketplace. Both the countries adopt reforms from time to time to further enhance trade and investment relationship amongst the two leading economies. For instance in 2013, by looking at the rapid growth and share of India in world market, the Dutch Government declared India to be its top priority destination for economic ties and investments (Government of India, Netherlands 2012: 1).

Germany has been another important partner of India in foreign investment since economic reforms. Being an important source of investment, it was positioned at sixth place during 1991-2005 with the cumulative inflows of $1,278 million (6%). However the FDI inflows slowed down in 2000s but still managed to maintain its place in India's

top ten investors list with the inflows of $5,581 million (4%) inflows during 2005-06. Germany slipped lower in the list because investments from UK and Netherlands outpaced the German Firms (Deutsche Bank Research 2005: 5). Yet the inflows of investment from EU including Germany are huge because of India's investment friendly environment, mutual beneficial relationship, large growing market and highly skilled workers class. These absolute advantages of India reduce the cost to German companies and encourage cooperation. Hence the cooperation is majorly seen in heavy machineries and automobiles, biotechnology sector, computers, electronic equipment and technology consulting services. These investments are sometimes in the form of subsidiaries or setting up new companies or mergers and acquisitions. The famous German companies investing in India are BMW, Volkswagen, Amazon, Audi, Porsche, Deutsche Bank, Cognizant technology etc. (Goswami et al. 2014: 26). A survey conducted on behalf of the Indo-German Chamber of Commerce (IGCC) (Business Monitor Survey), found that Germany has long term plans to invest in Indian market as it saw a potentially huge market and growth opportunities (German Mission in India 2011: 2). Since 1991, German exports, investments and technical cooperation to India have led to an impressive boost which has maintained its position every year in the list of top ten investors in India.

The strategic relationship between India and *France* began soon after India's nuclear test in (1998) which increased cooperation in trade and investment as well. This bilateral and strategic relationship made France a major source of FDI in India from $759 million (3%) during 1991-2005 to the ninth largest in the list with the inflows of $3,401 million (2%) during 2005-2014. French investment are mostly in financial and non-financial services, chemicals, cements and gypsum, fuels, readymade garments, cosmetics etc. (Ministry of External Affairs 2016: 3). Almost 800 French companies are investing and operating in India in the form of joint ventures, subsidies or branch offices with about 150,000 employees. The major investments that have captured the Indian market with huge demand and generated employment are L'Oreal in fashion industry, Capgemini in IT sector, Schneider, Airbus and Renault (Economic Times 2016: Foreign Trade Section).

As with France, a strong investment trade ties exists between India and *South Korea* and the relationship between India and South Korea saw an upswing in the process of investment after the CEPA was signed to promote trade and investment between the two leading economies in 2009. CEPA has strengthened economic ties by lowering or eliminating import tariffs with the trading country like India for variety of goods and services for at least 8 years (Sheshadri 2015: 23). The sectors that attract major FDI are energy, electronics, machineries, metallurgical industry, automobiles etc. The FDI was recorded $692 million (3%) during 1991-05 which further rose due to CEPA to $994 million during 2005-2014. The major Korean companies in the Indian market are Samsung, LG, Hyundai motors, POSCO (dealt in detail in chapter V of this thesis) (DIPP 2015: 2). The main reason for South Korea investing in India is affordability. English speaking, cheaper, skilled labour force (as compared to expensive Koreans), availability of large quantities of raw materials, large domestic market and diversified industrial base clinched the deal in India's favour for the Koreans. (Embassy of India, Seoul 2016: 1).

Switzerland has been an economic partner of Independent India since 1948 when these two countries signed the treaty of friendship. This treaty strengthened and expanded the trade and bilateral relationships. These economic and commercial ties strengthened more post liberalization policy in India in 1991 (Embassy of India, Bern 2015: 1). The inflow of FDI was recorded at $540 million (2%) during 1991-2005 and remained in the top ten investors list (10^{th}). India remains the favorite investment destination for Switzerland and ranked 11^{th} during the period 2005-2014 with inflows of $1204 million (0.72%). Around 250 joint ventures/companies/ subsidiaries are operating in India in various sectors such as pharmaceuticals, engineering, industrial equipment, textiles etc. Switzerland is aware of the immense potential of India and considers her as a global economic powerhouse. Hence Switzerland continues to invest in healthcare, renewable energy, clean technology, R&D, tourism etc. in India (FICCI 2013: 1-5).

A major change which was observed in India's list of FDI inflows after 2005 was the emergence of Cyprus and UAE in the top ten list, displacing Switzerland and South Korea. Interestingly the shares of investment of both these countries were almost

negligible during 1991-2005 and attained ranking in the top ten list of India recently after 2005. Cyprus with the cumulative inflows of $7,423 million (5%) grabbed 7th spot in the list, while United Arab Emirates (UAE) stood at 10th during the same period with the inflows of $2,386 million (2%). *Cyprus* till 2003 had a negligible share of investments in India. Investment inflow began when the two countries signed various MoUs on cooperation of IT and services (2002), development research in science and technology (2002), mutual promotion and protection of investments agreements (2002) etc. It started with a mere $3 million in 2004 and grew to a phenomenal $834 million (5%) in 2007, an impressive feat by any standard. The FDI inflow became stagnant till 2010, and was recorded at $4,714 million (DIPP Report, 2010: 1). Such MoUs and bilateral cooperation were signed in fields of trade, investment, technology, energy, health and tourism to encourage economic and cultural exchanges, which further resulted in the increase of investment from Cyprus. Cyprus's FDI interest in India mainly concentrated around construction and real estate activity sectors (High Commission of India, Nicosia 2016: 1). In a recent development, the Indian cabinet approved the DTAA with Cyprus, to encourage more investment and give India right to tax capital gains routed through Cyprus, akin to treaties with Mauritius and Singapore from 01 April 2017 (The Hindu 2016: Business).

Similarly, India and *UAE* enjoy a strong bond of friendship based on economic, religious and cultural ties. This led to increased trade and investment from UAE in India since 2005 (Indian Embassy, Abu Dhabi 2014: 1). UAE-India economic ties rose substantially in recent years mainly due to huge expatriate Indian population in UAE and India's large domestic market. The 'go global' approach of India provided opportunity to UAE investors to increase their stake in the Indian economy. India also offers a great platform to UAE to diversify from its petroleum based economy to tourism. For India the vast inflow of capital came as a shot in the arm for its economy (UAE Embassy 2009: 1). The companies investing in India from UAE are Emirates, Damas Jwellery, Abu Dhabi Commercial Bank, DP World, Emaar Group.

The trends described above show that Mauritius had the maximum share of FDI at 40% followed by USA (20%), UK (7%) and Japan (8%). The last in the list was South Korea (3%) followed by Switzerland (2%) during 1991-2005. In April 2005-14, the first place was taken again by Mauritius followed by some re-shuffling among other among other players such as UK (10%), USA (7%) and Japan (6%). The two new countries that occupied place in the top ten lists were Cyprus (5%) and UAE (2%) expelling South Korea and Switzerland out of the list in this period.

I.7 Foreign Direct Investment in Bangladesh: Pre Reform Era Issues and Survey

Bangladesh got independence in 1971 through a liberation war with Pakistan. As a newly independent country, Bangladesh received huge aid from the World Bank and IMF. The first and foremost priority was settlement of its economy, growth and planning, development of various sectors for revenue generations. Bangladesh followed the safe approach of utilizing only its public sector and import substitution industrialization strategy till 1980 to bring economy on the track of growth and development. In the process of development, various reforms were adopted. The country soon realized the importance of foreign investments, which were crucial to the growth and development process. The Government since then took various steps to improve the competitiveness, capital formation, economic efficiency, transfer of technology and dismantled state intervention to create privatization and export oriented growth. These measures helped attract FDI to a large extent. (Dabour 2000: 28). Liberalization and economic reforms worked as a powerful weapon and were seen as an absolute need for the economy as it created opportunities in the form of employment, production capacity, labour skill enhancement and integration of the domestic economy. Various measures and changes in FDI investment regimes were taken up slowly since independence which are broadly categorized in following three phases:

- ***First Phase (1972-79):*** This was the first phase of reforms after Bangladesh became an independent country. Immediately following independence, the government declared an economic policy in 1971 aiming to develop a socialist state with the policy of nationalization. The main focus of the policy was to grow

the existing domestic industries such as jute, textile and sugar, which were the largest revenue generating sectors for the economy. Other than these industries, the government nationalized around 86% of country's industrial assets under its control. From 1973 to 1978, these state governed industries faced losses, creating a pressure on the government to follow free market policy and to encourage the role of international trade and investment. The aim had been to protect the domestic industries through high tariffs scheme on imported products but the approach was found to be inefficient due to lack of growth strategies, skilled labour, capital and currency to develop the nationalized industries. Hence, in 1976 the Government decided to limit public sector operations to 18 sectors that are either revenue generating or revolve around national security. To reduce the debt burden, the government also denationalized a number of enterprises and abolished nationalization. In this process, public-private relationships were encouraged in public sector enterprises and only a few reserved sectors were opened to foreign investments (Centre for Policy Dialogue 2011: 306).

As a developing nation, Bangladesh was aware of the importance and necessity of foreign investment. The first five-year plan did not bring any structural change due to it's over dependence on foreign aid, which Bangladesh Government openly appealed for from the international community. This impacted its internal development as they received a large aid amount and were not worried much about planning for growth and development. Bangladesh's weak trade policies, public sector predominance, small size of its domestic market, absence of basic infrastructure facilities, ineffective laws and regulation for trade and investment regulations and equally importantly, an unstable political scenario in the 70's collectively contributed to impacting the flow of FDI into Bangladesh. After assessing the criticality of its economic situation, the national level planning commission prepared a two-year plan to tide over the immediate crisis. The plan for 1978 to 1980 was directed towards economic priorities like building a capitalist approach, priority to private sectors, liberalising investment environment and subsidy. For making a better framework for second five year

plan, the government planned to implement two year planning to implement spillover projects such as management of the post effects of flood of 1978, extensive crop rehabilitation program (1978-79), and fertilizer subsidy to farmers (Ibid: 306).

- ***Second Phase (1980-1990):*** In early 1980's, a series of economic reforms were introduced to improve its industrial sectors Two five-year plans were declared to bring the economy back on track - the second five year plan from 1980-85 and third five-year plan from 1985-90. During the second five-year plan (1980-85), the first and foremost measure taken up by the government was limiting public sector operation to few important sectors like defense, power, nuclear energy, air transport and telecommunications. Private sector was encouraged in all other sectors without any limit for forming public-private sector partnerships. (Shah 2013: 10). To ensure the legal protection for foreign investors the Foreign Private Investment (promotion and protection) Act was declared in 1980 against nationalization, guaranteeing repatriation of profit, capital and dividend. The Act ensured equal treatment to both local and foreign investors. It also guaranteed adequate protection to foreign investment like legal protections and intellectual property rights such as patents, trademarks, design and copyrights. This increased the private sector involvement in industrial assets to 59% in 1982. In 1983, a new industrial policy was announced and Export Processing Zones (EPZ) were established which started the shift to export oriented industrial policy from import substitution policy and privatization. For rapid implementation of the new industrial policy, trade and investment in Bangladesh, Board of Investment (BoI) was established. The BoI helps in resolving the issues related to infrastructures facilities to investors, disputes settlement, pre investment counseling. As a result FDI increased to some degree in the late 1980s (Bangladesh Chamber of Commerce and Industry 2009: 1).

The third five-year plan was declared in 1985 and was said to be an "ambitious five-year plan" as the lofty objectives were to bring down population

growth by 1.8%, reduce poverty by increasing employment, and increase GDP growth, increase export by 5.9% domestic saving by 10% and attain self-sufficiency. The actual results came nowhere close to the grand plans envisaged. In 1986, a Revised Industrial Policy (RIP) was announced, with objective of moving the economy towards privatization and deregulation under SAP (Structural Adjustment Program). The government also adopted several measures to increase investment in the economy: quantitative restrictions were removed for e.g. reduction in the number of items from negative list under deregulation of imports; seven industries were opened for private investment, large and medium industries were planned to be opened up for investment in a span of three years. The RIP also took the initiative to allow the investors to import machinery, raw materials and equipment (if they are using their own resources) without prior approval. By reducing the role of public sector and promoting private sector led growth, Bangladesh Government laid the ideal platform for attracting foreign investments and export-oriented industries. Continuing the trend, the fourth five-year plan was launched in 1990 and a new industrial policy was announced a year later in 1991. This policy aimed at making Bangladesh a market-based competitive economy (BIISS 2000: 137-39).

- ***Third Phase (1991 onwards):*** The Government introduced various policy incentives in 1991 to lure foreign investment along with domestic investments. Measures like removal of restrictive provisions for equity participation, special credit facilities to investors and rules and regulations for industries to protect the national interest by protecting health of people and environment were initiated. To enhance the investment environment, export oriented industries were expanded, the process of investment for both domestic and foreign investments was simplified, foreign investors were guaranteed against nationalization, exemption on royalties, loans, capital gains, sales share, profits and dividends were assured. Bangladesh transitioned to a free market with export-led growth strategy and in 1993, current account convertibility was injected instead of depending on flexible exchange rate. The tariffs and non-tariff barriers were also reduced. By 1994, free

import share rose to 94%, quantitative barriers were demolished. In 1995, the rate of protection for the Bangladesh economy declined to 30% from the earlier 59% in 1992 and tariff rates for consumer goods was also curbed by policies (The Daily Star: 12 April 2014).

I.8 FDI in Bangladesh: Post 1996 Survey and Issues

The proactive phase of liberalization was seen throughout in the early 1990s, when different measures were undertaken by the Bangladesh Government and authorities to increase trade and investment. Apart from the above mentioned incentives of the third phase (1991 onwards), other incentives such as elimination of restrictions, tariffs reduction, tax holiday, royalty payments and technical know-how fees[9] were introduced and this resulted in significant inflows of FDI since 1996. This helped foreign investors to enjoy the same benefits as local investors did - 100% foreign equity and full repatriation of profits. In addition to the FDI-friendly policy, the Government of Bangladesh established EPZs (Export Processing Zones) to provide lucrative incentives to the foreign investors (Rahman 2015: 181). Furthermore in the late 1990s, Bangladesh announced a series of measures to liberalize its FDI through foreign-owned joint ventures in all industrial activities except reserved industries such as banking, insurance, other financial institutions, arms and ammunitions, forest plantation etc. (Sahoo et al. 2014: 81). All foreign investments were to be registered with one of the following agencies: Bangladesh EPZs Authority (BEPZA), the Bangladesh Small and Cottage Industries Corporation (BSCIC), or the Board of Investment. These combined incentives gave a significant boost to FDI inflows in the mid 1990's. The biggest motivation for investors was the lucrative textile sector and the oil and gas sector of Bangladesh, which popularized Bangladesh in the world (CPD 2006: 124). In 1996, Government of Bangladesh allowed foreign investment in energy sector to generate power for domestic consumption and this invitation marked a major milestone for FDI in the country. The government gave various incentives to this sector such as exemption of corporate income

[9] Technical know-how is defined as a technical knowledge and experience for doing and executing a particular activity. This is also mentioned in Foreign Investment Report, 2009.

tax for 15 years, local financing support with regulations and 10% import of raw material and equipment up to 12 years without duties.

The industrial policy of 1999 and 2005 turned out to be a boon for trade and investment; the World Bank, in 2005, suggested that Bangladesh was experiencing a more stable FDI of 85-90% of total capital flows. In 2009-10, 89 new foreign and joint venture investments costing approximately $590 Million were registered under the BoI (BoI 2010:2). These ventures and investments were encouraged mainly in export oriented industries, services, engineering, clothing, and high technology products that either substitute imports or add to exports. Since the mid 1990's there was a considerable change in the trends of flows of trade and finance including a surge in FDI in Bangladesh. The next section lays out the detailed analysis of those changing trends.

I.9 Quantum, Compositions and Directions of FDI in Bangladesh Since 1996[10]

I.9 (i) Quantum of FDI in Bangladesh Since 1996

This section of the chapter analyzes the pattern of FDI inflows in Bangladesh since liberalization policy (1996) was implemented in the country. Table: I.4 shows the pattern of FDI inflows and Figure I.6 (Shown in I.6 of Appendix I) shows the graphical representation of FDI inflows over the years. Inflows of FDI have generated economic benefits to the country by increasing technology transfer, physical capital formation, domestic competition and efficient resource management. The record of FDI is kept and reported by the Statistical Department of Bangladesh Bank. Right from the early 1990's, the focus of Bangladesh was to encourage private sector investment in the economy by moving towards privatization and liberalization. The reason for the slow start of FDI inflows in Bangladesh was the late announcement of liberalized measures for FDI policy framework. From 1996 onwards, the government opened up new sectors of the economy for foreign investment and since then ups and downs in FDI trends were observed. Looking at the FDI data, fluctuations in the level of FDIs can be noted; as against the almost steady rise observed with FDI in the Indian context. In 1994, the largest joint

[10] The data for Quantum, Directions and Compositions are presented in Million US$.

venture (JV) project (Karnaphuli Fertilizers Company) of Bangladesh closed down; this triggered lowering of investment in 1995.

Table I.4: Patterns of Foreign Direct Investment Inflows in Bangladesh (1996-2014)

Year	Total FDI inflows (In Million US$)	Compound Annual Growth Rate (CAGR) in %
1996-97	366.85	
1997-98	603.30	64.45%
1998-99	394.10	3.65%
1999-00	383.22	1.47%
2000-01	563.92	11.35%
2001-02	393.76	1.43%
2002-03	379.18	0.55%
2003-04	284.16	-3.58%
2004-05	803.78	10.30%
2005-06	744.61	8.18%
2006-07	792.74	8.01%
2007-08	768.69	6.96%
2008-09	960.59	8.35%
2009-10	913.02	7.27%
2010-11	779.04	5.53%
2011-12	1194.88	8.19%
2012-13	1730.63	10.18%
2013-14	1181.44	7%

(Source: Statistics Department, Bangladesh Bank, Bangladesh)

On the flip side, a staggering rate of FDI can be seen in 1996-97 when the cumulative inflows was recorded at $366.85 million USD and increased to $603 million in 1997-98. The foremost reason for the rise in net inflows of FDI was on account of government allowing foreign investment in gas and oil sector (the most resource abundant sector in Bangladesh) in 1997 -1998. Another reason for the spike was that during the period (1997-98), most of the domestic industries were using energy inefficient technology and foreign investment came as a boon for them. This created an opportunity for Bangladesh to emerge as an investment destination through JVs between foreign investors and local businesses (BIISS 2000: 119). The bump in FDI was followed by a decline in 1999, where except for textile sector, all major sectors like power, telecommunication and trade and commerce showed a decline and recorded only $383.22

million (1.47%). The textile sector saw an increase in investment only because of the abundance of raw material, huge manpower employment, low wages and lower cost of capital offering disproportionately high returns.

From 2001 to 2004, the falling trend of FDI continued and was recorded at $393 million (1.43%) in 2001-02 and $284 million in 2003-04. This decline continued for many reasons, one among them being the political unrest which scared away foreign investments. The economy took time to regain the trust of investors. To deal with the decline, another round of investment allocation was done mainly in cement industry to encourage infrastructure, power and textile sector. EPZs were also formed so that the political disturbances have a minimal impact on the investments (CPD 2005: 124). These incentives resulted in a significant jump from 2004-05 onwards, with the economy enjoying encouraging incremental growth. After 2004-05, the flow was at $803 million (10.30%) due to large scale investment in new sectors such as telecommunications, trade and commerce industries besides gas, cement and textile. However, the year 2004 to 2008 showed a substantial improvement in FDI, with inflows of $744 million (8.18%) in 2005-06 and $768 million (6.96%) in 2007-08. The main reason for this achievement was the BoI which acted as an agency for resolving issues like infrastructures facilities to investors, disputes settlement and pre-investment counseling (Bangladesh Chamber of Commerce and Industry 2009: 4).

The country received an increased amount of $960.59 million (8.35%) in 2008-09 and witnessed an immediate fall in next few fiscal years. In 2009-10 it was $913 million (7.27%) and $779 million (5.53%) in 2010-11. FDI in Bangladesh has been disproportionately low and has fluctuated throughout its journey compared to other South Asian countries such as India. Main reasons attributable to declining trends were identified as “political instability, inadequate infrastructure, inefficient bureaucracy, corruption and a slow moving privatization process” (Rahman et al., 2014: 4). The reasons given by Rahman rightly describe the situation of volatility in Bangladesh in the field of external sectors like foreign investment. The lack of adequate laws and regulations, transparency and lack of vision in government are amongst other important reasons for the fluctuating FDI. Considering 1996-97 as the base year, the data for 2011-

12 reveals that FDI inflow was $1194 million (8.19%) and reached four digits for the first time. FDI reached its all-time high in 2012-13 with the cumulative inflows of $1730.63 million and recorded a low of $284 million in 2003-04.

During 2012-13, a significant increase in FDI was recorded due to the various policy measures of the government such as allowing an increase in reinvested earnings, intra-company loans and equity capital. Increase in reinvested earnings boosted the confidence of the investors in long-term investment in Bangladesh despite all the apprehensions in local and international think-tanks regarding the performance of its economy. (Raihan 2008: 15). In 2013-14, FDI inflows declined to $1181.44 million (7.12%). Most of the investment in 2013 was for development and payment of fees for the 3G network, which did not generate much employment and resulted in degradation of FDI in telecom sector with inflows of limited $51 million (UNCTAD 2014: 20). Overall, the flow of FDI in Bangladesh increased but has had an irregular trend over the last fifteen years.

I.9 (ii) Compositions of FDI Inflows in Bangladesh Since 1996

This section analyzes the sectoral compositions of FDI inflows in Bangladesh since 1996. The top 10 sectors contributing the maximum share in the FDI inflows are taken into analysis. Table I.5 shows the rank wise sectoral share in FDI inflows, while Figure I.7 (Appendix I) is the pie diagram depicting the percentage share of these sectors in total FDI inflows.

The sector that attracted maximum FDI between1996-2014 was *Transport, storage and telecommunications* with cumulative inflows of $3366.73 million (69%). The contribution of this sector consistently increased from merely $1.46 million (1996-97) to $445.99 million (2009-10). The telecom sector in Bangladesh showed a growth that exceeded all expectations. With increasing market demands, potential companies such as Banglalink, Robi and Teletalk invested both locally and internationally to setup further growth. Due to a few challenges in this sector, it went through fluctuations in FDI from $527 million (2012-13) to $278 million (2013-14). Still this sector managed to be the

highest grosser of FDI in Bangladesh since economic reform because of the privatization policy of government, high taxation, latest and better technology.

Table I.5: Compositions of FDI Inflows in Bangladesh (1996-2014)

YEAR	1996-97	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Cumulative Inflows in Million US$ (1991-2014)	Percentage share of sectors (1991-2014)
Transport, Storage &Telecommunication	1.46	7.25	24.05	0.47	5.4	20.71	61.74	43.8	264	269	305	299.9	579.62	446	54.5	179	527	278.1	3366.73	69.78
Power, Gas & Petroleum	109.1	230	180.9	106.57	313.8	176.1	58.07	87.4	198.4	209	230	157.9	46.89	73.7	127.2	244.9	93.7	73.55	2717.86	56.33
Textiles & Wearing	44.77	117	37.16	143.71	112.8	67.15	76.66	32.3	74.98	73.5	105	93.42	130.35	158	225.2	241.4	412	432	2577.91	53.43
Banking	115.9	140	94.39	19.62	29.22	38.27	40.93	52.4	94.88	130	91.8	156.8	110.2	112	225.2	253.4	269	227.3	2200.34	45.60
Manufacturing (Heavy industries)	90.31	66.3	39.29	82.08	71.19	76.84	119.6	58.7	160.5	47.4	42	35.5	53.61	75.8	105.1	173.6	300	312.5	1910.77	39.60
Services (Hotel & Restaurant, Clinical, Computer Software & IT etc)	2.57	6.97	6.94	3.32	9.83	3.86	11.5	2.6	2.04	1.07	1.82	7.02	7.77	19.7	20.39	27.21	50.8	77.96	260.82	5.41
Trade & Commerce (Trading, Insurance and NBFI)	2.51	4.78	10.93	4.88	6.03	17.03	8.31	2.88	6.92	12.2	12	14.46	12.33	17.2	9.65	19.31	26.5	47.99	236.01	4.89
Agriculture & Fishing	0.26	2.33	0.46	2.88	15.72	0.95	2.41	4.11	2.07	1.37	4.57	3.65	19.14	11	11.53	49.5	29.7	29.04	190.66	3.95
Others			0.01	0.07						0.71						0.03	0.06	13.04	13.92	0.29
Construction													0.06	0.08	0.36	1.01	6.85	4.08	12.44	0.26

(Source: Authors calculation based on the data from Statistics Department, Bangladesh Bank)

This encouraged a healthy competition between private partners and foreign investors in telecoms sector resulting in rapid profitability and growth (Rahman 2012: 17). The sector faced challenges such as the lack of a renewal process for telecom and 3G license, which discouraged long term investments. Later, the renewal and license processes were made easy and transparent which ended up restoring confidence amongst the investors in this sector. (Islam 2010: 17).

The *Power, Gas and Petroleum sector* receives the second highest FDI in the list with the FDI inflows of $109.09 million (1996-97) to $176.12 million (2001-02). Natural gas is the most important source of energy in Bangladesh, which fulfils the demand of about 75% of commercial energy requirements. Bangladesh offered great incentive package for FDI in power sector by way of making FDI freely convertible in current account. The rising investment in this sector helped in developing capacity of its economy as also its infrastructure in tandem. (Khatun et al. 2015: 23). The investment opportunity in power and energy sector provided ample scope since the local government lacked capital, had low production capacity, faced frequent load shedding against an ever expanding capacity of power grids (Rahman 2012: 9). Despite having such a high potential the FDI inflows saw a decline from the year 2000 onwards.

The trends of FDI inflows in this sector showed frequent fluctuations, in 2002-03 it was $87.44 million; in 2008-09 it dropped to $46.89 million and rose to $73.55 million in 2013-14. The reason for such fluctuations of FDI in gas sector was availability of another locally unexplored alternate primary source of energy- coal. Barapukuria, Khalaspur, Phulbari, Jamalganj and Dighipara mines held a total of 3,300 million metric tons in reserve. This shift from natural gas to coal assumed importance as natural gas only fulfilled the current demands and its reserves were expected to soon get exhausted. Future demands needed newer source of energy for which was coal exploration was deemed essential. Bangladesh used to import coal till then and its exchequer was heavily impacted with frequent price hikes. Self-reliance in coal was seen as a way to save its precious foreign exchange (Ahmad et al. 2013:10). Even in the face of such fluctuations in power and energy sector, this sector managed to attract second highest FDI, primarily

due to the continuously rising demand for energy in a developing country like Bangladesh. The cumulative share of this sector was recorded 56.33%

Another crucial sector which attracted FDI during the second quarter of reforms was *Textile and Wearing*, with a cumulative percentage share of 53.43% and cumulative FDI inflows of $431.97 million (2013-14). According to UNCTAD, the textile sector was successful due to the investment in readymade garments, which helped in generating huge employment and revenue. The future prospects were very promising for this sector because of the increased global demand for garments and the competitive advantage in cheap labor (UNCTAD 2012: 14) and the presence of top retailers, fashion brands and pricing. In the beginning of the reforms, the inflow was just $44.77 million in 1996-97 which rose to $105 million in 2006-07 and further to $412 million in 2012-13. The journey of FDI in this sector had its ups and downs as the working conditions; salaries and safety measures in the garment factories were below international standards. Following the recommendation of BGMEA[11], the government stopped FDI in almost 500 export oriented garment units due to the lack of safety and work measures. This has resulted in a downturn in FDI during 2000-2006. FICCI, Bangladesh suggested adopting safety standards as followed globally as in China, India and South Korean Countries. This placed the requisite pressure on foreign investors and local entrepreneurs to improve the working and safety conditions in readymade garment industries (Hossain 2015: 26).

FDI inflows in *Banking* doubled since 1996-97, with inflows touching 115 $million, which subsequently rose to $227.28 million in 2013-14. Azizur Rahman, Deputy General Manager of Bangladesh Bank stated that the investment flows in banking sector was huge because it fulfilled the terms of the Basel II accord. “Under the accord the banks had to raise their paid-up capital to Taka 4 billion by June 2013. Foreign banks have met this condition”. The situation changed in 2012 when investment in banking sector was affected due to fraud appointment of highly political people without any relevant qualification in board of directors in the state-owned banks. This resulted in the infamous Hall-Mark scam at Sonali Bank which provided loans with amounts up to

[11] Bangladesh Garment Manufacturers and Exporters Association (BGMEA) is a largest apex body in Bangladesh of garment exporters.

Bangladeshi Taka 4,500 to relatively unknown entity with zero chances of recovery. Similar scandal occurred in the state-owned Bangladesh Small Industries and Commerce (BASIC) Bank Limited. Confidence in the banking sector significantly eroded as a result of such scams (Shah 2014: 8). The FDI fluctuated to $225 million in 2010-11 and the cumulative percentage share of banking sector was recorded at 45.60% in the period 1996-2014.

The fifth position in the foreign investment list was occupied by *manufacturing sector* with inflows of $90.31 million in 1996-97 and $173 million in 2011-12. The reduction in FDI share in manufacturing to $312.51 million in 2013-14 was a result of the gain in prominence of the telecom sector over the manufacturing sector. FDI in manufacturing sector fell due to a perception that Bangladesh had only a small domestic market whereas India was considered a much larger market and thus had more scope for investors. The percentage share of manufacturing sector was recorded at 39.60% during 1996-2014.

The Services sector is the sixth largest contributor of FDI in Bangladesh which started with the inflows of only $2.57 million in 1996-97 and further increased to $77 million in 2013-14. It was attributed to the late start of this sector as compared to other sectors. Under GATS (General Agreement on Trade in Services), liberalization of two services: telecommunications and hotels opened up and allowed foreign investment in other services as well. Under Doha round, Bangladesh was exempted from liberalization of the new sector as it was a newly formed country. Hence FDI in services started flowing in slowly (Ahmed 2015: 4-5). Another reason for low investment in services is that it faced competition from India, which was already a popular destination of services investment for the world. The increasing demand for services raised concerns in the government towards attaining its objectives such as economic growth, poverty alleviation, and inequality reduction with the help of service sector expansion and liberalization of investment in services. (Bangladesh Economic Update 2012: 11). In the initial years, FDI in service sector was meager, but from 2005-06, the trend changed completely and surpassed the more popular manufacturing sector. The various services,

which started to attract FDI, are IT, Tourism services, skilled and semi-skilled human resources (Ahmed 2015: 6).

The *Trade and Commerce sector (Trading, Insurance & NBFI)* grabbed seventh position in the list with the FDI inflows of just $2.51 million in 1996-97 to $47.99 million (2013-14) and with a share of 4.89% during 1996-2014. This sector was one of the most overlooked sectors of FDI. After realizing the importance of trade and commerce, Bangladesh government set up export processing zones to attract FDI. Furthermore to make Bangladesh a hub of shipbuilding, shipwrecking, maritime transport and logistics, a deep sea port was also planned. This has created better infrastructural driven incentive for foreign investors to invest in trade and commerce (Consulate of Czech Republic, Bangladesh 2016: 1).

Other ignored sectors are *agriculture and fishing* which is ranked second last in the list with a share of $29.04 million in 2013-14, up from only $0.26 million in 1996-97. The growth of manufacturing and services reduced the farming land areas and was the main reason for this sector to lag behind since the 80's. In late 1990's this sector started growing because of the introduction of hybrid seeds, irrigation facilities, and use of chemical fertilizers and mechanized cultivation. This resulted in an increase in FDI inflows to 19.14 million during 2008-09. This sector reached its highest investment in 2011-12 with inflow of $49.5 million post the economic reforms. This growth in agricultural sector was possible due to adoption of new technology, capital formation, increased prices of agricultural commodities, increase in profitability, high government subsidies, cheaper agricultural credit flows and inflow of FDI. (Food and Agriculture Organization: 19-21). Agriculture and allied activities (agro-based and agro-processing industry, agro-processing products, tea, and vegetables) was identified as potential sectors for investment (Commonwealth Secretariat 2013: 4). The trend shows that the foreign investment in agriculture sector was growing, but at a slow pace.

Last in the list of top ten sectors is *construction sector* which contributed a small share of only 0.26% during 1996-2014 with inflows of $12.44 million during the period. The growth of sector was important as new infrastructural development projects (EPZ's,

bridges (Padma Bridge), Payra Port) were in the pipeline. Factors such as low foreign investment, limited asset securitization, fear of terror attacks, distortion of land value, weak backward linkages and secondary property markets kept investments in this sector to a minimum. Increase in foreign investment would have benefited both, the government and investors in developing infrastructure for growth of manufacturing sector and exports (The Daily Star, 18 December 2016). *Other sectors* that attract FDI in a smaller measures were polymer industry, jute and jute products, frozen and processed fish industry, tea industry, home textiles, ceramics etc. with the cumulative share of 0.29%. The cumulative share of these sectors is still visible although individually the inflows in each one of separately them are almost insignificant.

I.9 (iii) Directions of FDI Inflows in Bangladesh Since 1996

For the country wise inflow of FDI in Bangladesh since 1996, the top 10 countries are taken up for analysis. Similar to the previous section, the time period for the analysis is 1996-2014. Table I.6 shows the directions of FDI inflows in Bangladesh while Figure I.8 of Appendix I shows the pie diagram depicting the percentage share of these countries in total FDI inflows. The strategic location of Bangladesh (between India and China; two fastest growing markets of the world), large domestic market and increasing purchasing power of 160 Million populations attracts foreign investments. Bangladesh has got special duty and quota free market access, signed bilateral trade agreements to avoid double taxation with EU, Japan, Canada and Australia and around 28 countries.

United Kingdom (*UK)* has been the highest FDI investor in Bangladesh with inflows of $2006.37 million during 1996-2014 and a share of 19.06%. The cultural links, aids and strong diaspora has made UK a leading business partner of Bangladesh. Major areas of investment are oil and gas, textile, tea garden, financial and services, manufacturing and pharmaceuticals. Investment is allowed for UK in almost every sector except Arms and explosive, nuclear energy, security printing, printing of notes/coin and mechanical extraction of reserved forests (High Commission of Bangladesh 2009: 1). In the long-run, it was anticipated that a huge consumer market could benefit businesses only if the barriers to business are removed in Bangladesh, which were persistent (Government of

United Kingdom 2015: 1).The incentives which are attracted UK to Bangladesh are unrestricted exit policy, tax holiday facility for 5-7 years (15 years in case of power companies), and 100% foreign equity under Foreign Investment Protection Act of 1980 (High Commission of Bangladesh, London 2015: 1).

Table I.6: Directions of Foreign Direct Investment in Bangladesh (1996-2014)

Top Ten Countries	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	Cumulative FDI inflows (1996-2014)	Percentage share (1996-2014
U.K.	138.60	180.90	28.07	40.45	162.50	67.55	41.95	79.62	153.50	77.88	123.70	149.80	105.60	66.50	144.64	128.19	159.49	157.43	2006.37	19.06
U.S.A	22.02	127.40	165.80	72.22	20.56	33.43	28.59	35.15	105.90	187.60	161.50	54.48	36.24	34.79	94.18	95.07	71.07	46.81	1392.81	13.23
Egypt									42.02	67.39	123.47	132.32	309.70	20.00	37.30	146.86	138.14	54.17	1071.37	10.18
South Korea	44.87	81.82	35.65	116.50	40.37	34.06	46.29	22.01	26.27	50.14	30.06	36.58	40.97	46.75	73.84	104.98	124.94	108.62	1064.72	10.12
Netherlands	0.89	1.07	11.54	44.36	179.69	88.50	24.52	17.62	10.71	14.90	18.21	22.09	39.93	48.75	71.41	119.70	84.96	129.74	928.59	8.82
Singapore	0.56	2.51	0.53	1.94	0.85	2.09	16.26	3.16	97.55	26.32	11.78	37.32	14.75	311.90	22.77	15.59	103.60	187.63	857.11	8.14
Hong Kong	7.50	21.74	12.92	30.42	26.89	14.37	23.64	7.96	39.31	43.33	62.49	41.65	47.55	72.95	93.58	68.07	86.34	113.43	814.14	7.74
Malaysia		9.41	2.24	3.78	7.00	7.33	17.51	1.58	63.86	25.69	45.73	1.51	79.15	40.17	2.00	7.72	337.97	56.74	709.39	6.74
Japan	40.55	26.10	6.99	46.39	17.18	9.75	23.82	29.33	49.68	22.62	28.79	26.69	58.53	22.03	35.05	31.36	99.04	67.22	641.12	6.09
U.A.E.	0.19	0.20	1.66			0.86	13.16	5.81	12.81	100.50	62.02	134.30	70.29	33.29	22.00	7.34	50.48	13.48	528.39	5.02
Norway			24.04	2.98	0.84	11.14	32.82	33.14	59.53	53.42	77.35	6.74	62.37	55.89		24.31	8.56	57.64	510.77	4.85
Total																			10524.78	100

(Source: Authors contribution based on the data from Statistics Department, Bangladesh Bank)

United States of America (USA) is second largest investor in Bangladesh since 1996. It started with FDI inflows of $22 million in 1996-97 which rose to $187 million in 2005-06. The share occupied by USA is 13.23% with a total cumulative inflow of $1392.81 million during 1996-2014. Most of the FDIs inflows from USA were in gas sector as the USA has interests in investing in gas, electricity, pharmaceuticals and coal sectors. The major companies from USA were ASE and Unocal (United States Trade Representatives 2014: 1). USA became Bangladesh's largest investor in 2005–06 and 2006-07 with inflows of $187.60 million and $161.50 million respectively. The factors which attract US companies to invest in Bangladesh apart from the attractive investments policies of

FIP Act are Bangladesh's large workforce and availability of labour intensive industries such as textile, readymade garments, and leather industries. Bangladesh is seeing foreign investment in energy and power sector; most of which comes from the USA (US Department of State 2009: 8).

Bangladesh and *Egypt* had good commercial and trade relationships with each other as both the countries were members of two organisations - D-8 (D-8 is an organization for economic cooperation of eight member countries including Bangladesh) and the Organization of Islamic Cooperation (OIC). The reasons of significant trade and investment partnership between the two were skilled Bangladeshi labours in textile sector, low wage rates for construction workers, common religion and other social aspects. FDI from Egypt was helpful in bringing prosperity to Bangladesh and creating a virtuous cycle of growth (The Independent: 24 November 2013). Inflows began in 2004-05 with a small amount of $42 million which rapidly rose to $309 million in 2008-09. The cumulative inflows was recorded $1071.37 million (10.1% share) during 1996-2014. The major sectors of Egyptian investments were telecom, hotel, tourism and readymade garments. Egyptian cellular company named Banglalink entered in 2004 and today is the second largest service provider in Bangladesh. During the economic recession of 2009-10, FDI inflows from Egypt declined to $20 million and recovered to $138 million in 2012-13 (Saha 2012: 4). To boost industrial sector investment, Egypt signed a bilateral agreement with Bangladesh focusing on the high potential fertilizers, petrochemicals and ship-building sectors (The Financial Express 2016: Economy).

South Korea and Bangladesh enjoyed friendly relations with each other and were involved in infrastructure development, transfer of knowhow, trade, business migration, and human resource exchange with skills development. Apart from capacity building, cooperation in education and socio-economic sectors also built bonds between the two. Korea Bangladesh Chamber of Commerce and Industry (KBCCI) were formed with an objective of starting a new trade regime with stronger mutual presence in each other's markets (Korea Bangladesh Chamber of commerce 2015: 1). The contribution of South Korea in Bangladesh (FDI) was recorded highest during the second half of 1990s. During 1996-97 it was recorded at $44.87 million which increased to $104.98 million in 2011-12

and further to $108.62 million in 2013-14. South Korea's major areas of investment in Bangladesh were energy, readymade garments, infrastructure, jute and leather. Now Korea's biggest electronics company Samsung has also initiated smart phone manufacturing in Bangladesh. (CPD 2014: 16).

Netherlands is the fifth largest investor in Bangladesh with a cumulative inflow of $928.5 million and share of 8.82% during 1996-2014. The inflows began with only $0.89 million (1996-97) but rose to $179 million in 2000-01. Interestingly, Netherlands share in 2000 was at its maximum FDI and then dropped to 5% after 2000. The bilateral investment treaties gave Bangladesh tariff free access to European Union (EU) and its Generalized System of Preferences (GSP) to promote and protect foreign investment. The Dutch-Bangla Chamber of Commerce and Industry (DBCCI) worked closely with the government for creating policies which enable greater investments by Netherlands in Bangladesh (Embassy of Dhaka 2016: 7).

Middle-income developing countries such as *Hong Kong, Malaysia and Singapore* also expanded their economies and investing in low income countries such as Bangladesh. *Singapore* was the sixth largest investor in Bangladesh with cumulative inflows of $857 million during 1996-2014 with a share of 8.82%. The country mainly invested in the telecom sector (e.g. SingTel from Singapore) and increased the volume significantly in 2004-05 with the FDI inflows of $97.55 million. Although its investment declined since 2005-06 to $26.32 million, yet it remained a significant contributor. Apart from telecom sector another crucial sector for investment was trading (Unnayan Onneshan 2012: 12). Similarly *Hong Kong* grabbed 7.74% share and was seventh major FDI supplier in Bangladesh in the period 1996-2014. The cumulative share was recorded at $814.14 million (1996-2014). In 2013-14 FDI recorded tremendous inflows of $113.43 million. Various duty free access benefits that were offered to investors from many other countries also encouraged Hong Kong to invest more.

Bangladesh's strategic location at the very nexus of what is one of the most significant trade routes of the 21st century, (the Indo-Pacific Economic Corridor) linking

South Asia with China, Singapore and the world helped in building economic ties with many countries. Bangladesh was a huge exporter of manpower, which made it the country's largest source of foreign exchange (Mozena 2013: 4). Another middle income country, Malaysia, recorded cumulative inflows of $709.39 million (1996-2014) with a share of 6.74% in Bangladesh. As on July 2013, Malaysia was the largest investor in Bangladesh mainly in power stations and telecoms infrastructure sector. However, FDI from Malaysia declined sharply in 2007-08 to $1.51 million and further to $2 million in 2010-11.

Japan was a major development partner in Bangladesh as both the countries shared friendly relations. Investment from Japan was encouraged via agreements that enhanced cooperation in commercial and technical fields. Agreements such as DTAA, prevention of fiscal evasion of taxes on income convention in 1991 followed by Investment Promotion and Protection Agreements in 1999 and an agreement on technical cooperation in 2002 played a key role in boosting Japanese investments (Embassy of Japan, Dhaka 2015: 1). This has made Japan, the ninth largest investor in Bangladesh with a cumulative FDI inflow of $641.12 million (1996-2014) and an FDI share of 6.09%. Main MNCs like YKK Corporations and Taiheyo from Japan invested in Bangladesh as the former looked to become a prominent player in Bangladesh's shipbuilding industry (Rashid 2012: The Daily Star). The tenth largest investor in Bangladesh was *United Arab Emirates (UAE)* with cumulative inflows of $528 million during 1996-2014 and share of 5%. UAE invested significantly in textiles, vegetables, fish and steel sectors while Bangladesh was more interested in UAE's petroleum. Bangladesh Business Council (BBC) was set up in Dubai to enable hassle free investments (Khaleej Times, 18 January 2015).

In brief, the top five nations to bring in FDI into Bangladesh since 1996 were UK, USA, Egypt, South Korea and Netherlands. . These countries were involved in large number of joint-ventures with Bangladesh. Hong Kong, UAE, Japan and Malaysia also figured in the top ten list. In recent times, FDI inflows in Bangladesh have become versatile on the basis of its directional compositions. According to report of World Bank-

International Financial Corporation (2006) "Bangladesh is the third easiest country to do business in South Asia". The report further added that Bangladesh had made strong efforts to improve the business climate in the country with the introduction of various policies and measures such as the new Land Registration Act, an improved security system and a reduced corruption level in land transactions. The report judged the Bangladeshi regime to be one of the most liberal in the world as it allowed FDI without pre-approval formalities, limits on equity participation or even on the repatriation of profits and income. This helped Bangladesh in attracting FDI significantly (The World Bank Report 1999: 14).

I.10 FDI, Society and Environment: Interconnections and Interfaces

The above sections of the chapter have established FDI's emergence trends, quantum, directions and composition of FDI in India and Bangladesh; all of which have helped understand the increasing importance of FDI for these countries. The role played by foreign investment is increasing in various sectors, enhancing growth process, raising the GDP, increasing country-wise connections and ultimately helping in the development process. It has brought in capital, modern technology, trade, sectoral growth, employment, revenue and development as a whole. These benefits have made it an important engine of development since 1990's. However, a few questions emerge such as- does FDI have only a positive impact on the host economy? Have these two leading South Asian economies suffered in anyway whatsoever because of adverse effects of FDI? Is the FDI interconnected with other variables of the host economies?

The answer to these questions is unclear and the resolution of these queries forms the central theme of this thesis. FDI has many interfaces such as society, economy and environment; the impact created by foreign investment on these variables is not a clear black and white case. FDI while a major factor of development in India and Bangladesh is argued to leave spillover effects. Hence it is important to understand the interconnection / co-relation between the FDI and the environment, and FDI and the society before doing a detailed analysis of spillover effects of FDI since liberalization.

I.10 (i) FDI and Environment

FDI is a key factor for economic development while environment is a key factor for sustainable development. Both are very crucial for the equilibrium of the economy. Developing countries such as India and Bangladesh are alleged to give first preference to FDI over the environment, as it might seem to be the easiest route for growth. After globalization became a trend, development through domestic sector was not sufficient enough to gain growth hence the dependency on external sector (International Trade and Foreign Investment) emerged. This gave birth to economic reforms triggering FDI inflows which brought in new and modern technology, innovation, efficiency and capital in the domestic territory of India and Bangladesh (host countries). Since the early 1990s, massive industrialization has occurred; and FDI played a major role, but it also impacted the environment.

The modern and new technology that came through FDI is better and assumed to be environment friendly because it was theorized to be more energy efficient and compliant with stringent laws. The inflow of apparently such 'clean'" FDI is dependent on many factors such as stringency of environmental laws, resources usage, environmental awareness, competitive pressures, attitude of the host country's government, the sectors in which FDI is inflowing; which means that if any of these are ignored or bypassed, the end results could be seriously detrimental to the environment. In such cases, the cheaper obsolete and pollution intensive technology tend to replace environment friendly modern technology. FDI in such cases also run the risk of turning out to be a major source of pollution emission, negative externalities, energy consumption, deforestation, mining, water pollution and so on. Therefore, at this point, an interface between the two emerges which states that FDI causes growth and development on the one hand and environmental deterioration on the other in the host countries (India and Bangladesh).

Hence, the question still remains – does FDI have a positive or a negative relationship with the environment in India and Bangladesh? The interconnections between the two can be either positive or negative or both. Digging deeper will thus provide resolution to this question. Towards this purpose it is essential to deal with this research question in

detail and thus forms the basis of the next three chapters of the thesis (Chapter II, III and IV) for both the countries (India and Bangladesh).

I.10 (ii) FDI and Society

Similar to FDI-environment nexus, FDI has a close relationship with society. If FDI is a tool of development in host economy then the society is the recipient of that development in the form of wages, employment, social upliftment, negative and positive externalities. The foreign investment is located or set up in places where the investors can generate maximum benefits for e.g. urban areas, populated areas and metropolitan cities. The reasons are very clear as the needs of foreign investors of access to an educated work force, cheap labour, natural resources, transportation, and infrastructure can be fulfilled within the periphery of all these factors. Hence the impact is seen on the society in multiple ways.

The positive benefits of foreign investments (employment, wages, better lifestyle and social development) are enjoyed by these two labour abundant economies (India and Bangladesh), but the cost of those benefits are often ignored. Some of the costs, which the society has to pay for enjoying the benefits of foreign investments, are displacement, delay in compensations, environmental hazards (radiations, pollution, water crisis etc), adverse impact on health and local business. These adverse effects are often ignored by host countries and investors as it prevents the maximization of monetary benefits. The adverse effects of FDI on society can be minimized when awareness exists in the society, government, multinational corporations. A better education system, proper training of the workers, social equality, and compliance with laws and regulation by both investors and host country would ensure that society too benefits maximally from FDI.

In the case of India and Bangladesh, the questions are: Which aspect has been given more priority- society or FDI? In case the society is given more priority than FDI, what were the measures that were adopted by the host countries, and how those measures are different when FDI is given priority? If on the other hand, a balance between FDI and society has been maintained by these two new South Asian economies, what are the

techniques or measures used to successfully implement and sustain it? For getting the answer to such questions Chapter IV of the thesis takes up various case studies of FDI in India and Bangladesh that have impacted (positive and negative) the society and governments, and the response of societies, communities and geographies against those foreign investments.

I.11 Regulatory and environmental frameworks for FDI in India and Bangladesh

To maintain the standards of environment in India and Bangladesh, the governments have instituted certain laws and regulations that require compliance by local and foreign investors. These laws and regulations are meant for the welfare of the society and environment and thus it is important to know their stringency before assessing the impact of FDI on environment.

I.11 (i) Regulatory and environmental frameworks for FDI in India

In India, the major regulatory authorities are Central Pollution Control Board (CPCB) and the Ministry of Environment and Forest (MoEF). A lapse in adherence to regulations by foreign investors resulted in incidents such as the Bhopal gas tragedy. Hence these regulations need to be monitored by the authorities carefully as they are in the mutual interest of foreign investors and India's society and environment. Policies to protect environment in India given by MoEF (2006) are as follows:

- Environmental Protection Act, 1986, Amended 1991.
- National Conservation Strategy and Policy Statement on Environment and Development, 1992.
- Policy Statement for the Abatement of Pollution, 1992.
- National Environment Policy, 2006
- Vision Statement on Environment and Health.

Apart from these polices, there are several specific rules and legislations for the protection of environment found from the International Center for Environment, Audit and Sustainable Development and the Ministry of Environment, Forest and Climate Change (2016). They are as follows:

- The Water (Prevention and Control of Pollution) Act, 1974 and 1977, Amended in 1988, 1992 and 2003.
- The Water (prevention and control of pollution) Act, 1981, Amended in 1987.
- The rules are Air (prevention and control of pollution) Act for Union territories, 1982 and 1983.
- The Wildlife (Protection) Act, 1972, Amended in 1993, 2002 and 2006.
- Forest Conservation Acts are: the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act (2006), Forest (Conservation) Act (1980), Amended 1988 and The Indian Forest Act, 1927.
- Biological Diversity Act, 2002 and Biological Diversity Rules, 2004.
- Act of National Green Tribunal in 2010 (No. 19 of 2010).

I.11 (ii) Regulatory and environmental frameworks for FDI in Bangladesh

To make a foreign investment in Bangladesh, the company has to register with the Board of Investment (BOI) or the Bangladesh Export Processing Zone Authority (BEPZA). Considering the importance of FDI, the Bangladesh Government has implemented policy measures to enhance the flow of FDI so that economic growth can be stimulated. The Government of Bangladesh has listed the following five areas in which FDI is encouraged under joint venture as well 100% ownership by the foreigners:

- Industries located in the Export Processing Zones (EPZs).
- Export oriented industries.
- Basic industries based mainly on local raw materials and investment towards improvement of quality and marketing of goods manufactured and/or the increase of production capacities of existing industries.
- Industries that are based on high technology, which will either be import substitute or export oriented.
- Physical infrastructure projects on Build-Operate-Own (BOO) and Build-Operate-Transfer (Rayhan 2009: 107).

In these five areas, various environmental regulations have been developed, which help in curtailing the adverse effects of FDI on environment. The Ministry of

Environment and Forest (MoEF) mainly controls the environmental regulations. The ministry has even compartmentalized the industries into three different categories – Red, Orange and Green. These compartments are made based on the pollution related factors of the proposed investment (local and foreign). The environmental laws for foreign investments area are as follows:

- Bangladesh has made it mandatory to treat all effluents before they are discharged. The Bangladesh Environment Conservation Act (1995) and Rules (1997) makes provision for this, categorizing factories according to their ability to pollute and to state the measures that must be taken to address this, including treatment.

- Under the 1997 Rules, fabric dyeing and chemical processing industries are considered to be Red industries and consequently have to use an effluent treatment plan.

- The optimum use of land and water depend on appropriate land use plan. Bangladesh has approved the 'National Land Use Policy' in June 2001. Similarly the government has also come up with various other policies and regulations governing land use and environmental degradation in an effort to control future damage to the environment. Notable among them are the National Plan for Agricultural Research, the National Environment Policy and the National Environment Act (Bureau of Economic and Business Affairs, USA 2013: 2-4).

- As part of the efforts to improve the environment, investors are required to adhere to certain environmental safety standards in the form of clearance certificates issued by the Department of Environment (DoE). The project proposals are required to have the appropriate pollution control measures and the environmental impact assessments. There are few corrective measures also prescribed for existing industries, which possibly have negative impact to the

environment or public health and will be required to take corrective measures (Mundi 2011: 17).

- For the exploration activities by MNCs in National Parks such as Lawachara, Magurchara etc. special controls were put in place for the protection of elephants under the Bengal Elephant Preservation Act, 1879. Subsequently the Wildlife Birds & Animal Protection Act, 1912 provided for the preservation of the other kinds of wildlife in Bengal (USAID Report 2006: 10).

- The Environment Conservation Act (ECA) of 1995 aims to conserve and improve environmental standards along with controlling and mitigating environmental pollution. This Act empowers public to file complaint in DoEF regarding the pollution and degradation.
- The Environment Court Act of 2000 was enacted with the objective of authorizing the environmental courts to fine for compensation to the affected people. Therefore any incidence or environmental damaging activity by industries or investors will lead to heavy compensations.

- Various institutions have also been set up to regulate different environmental activities such as Bangladesh Water Development Board functions under Presidential Order No. 59 (1972) aiming watershed management, protection and conservation of fishes. The Forest Act of 1927 was set up with an objective to manage forest resources, and preserve the preserving the forests (Gain 2002: 289).

The above mentioned environmental laws are made by the Government of India and Bangladesh to ensure a healthier environment in spite of industrialization, trade foreign investments and domestic consumption. Breaking the laws results in environment degradation and further affects society, human health and geography. These acts have their area specific importance, which are made for the benefit of the industries, people, investors and sustainable environment of the host country. A

detailed analysis is presented in Chapter V detailing the laws that have been broken in both the countries by Foreign Direct Investors. This will help understand how seriously foreign investments are complying with the laws and regulations of the host country.

CHAPTER II

FOREIGN DIRECT INVESTMENT AND THE ENVIRONMENT IN INDIA

II.1 Background

We discussed some aspects of FDI in India since liberalization in Chapter I and highlighted the fact that FDI has been able to bring technology, managerial skills, and investment to various sectors from different parts of the World. FDI is believed to positively contribute to GDP growth and development, and furthers the growth of international trade, productivity, revenue, employment and capital enhancement (Sun 2002: 8). After four decades of restrictive and inward looking policy, India adopted economic liberalization in 1991 and has now become a major destination for FDI and trade (Acharyya 2009: 5). However the contribution of FDI in Indian economy is much more nuanced. FDI is not always advantageous as it comes with various spillover effects. These spillover effects trigger the debate over the net benefits of FDI and its impact on the society, geographies and environment.

Various academicians, researchers and environmentalists have argued on both sides of the debate with differing points of view. Those who encourage FDI, point towards its role in economic development of developing and underdeveloped countries as it brings better technology, capital, employment, skills, environmental friendly techniques, and growth stimulation. At the opposite side of the spectrum, it is said that FDI hampers economic growth because of instability causing macroeconomic factors such as environmental deterioration, terms of trade deterioration and balance of payment crisis (Syed et al. 2012: 204).

Many experts also engaged in a debate over the nature and direction of the relationship between FDI and environment. This chapter delves into this discussion using both theoretical and empirical tools. In terms of theories Porter Hypothesis, claims that, with increasing income developing countries tend to adopt more strict environmental regulations, as the environment is considered as a normal good. Similarly Organization

for Economic Co-operation and Development (OECD) in 2001 also found that transferring techniques of production that are more efficient and environment friendly can help achieve higher environmental standards (OECD 2011: 18). The Endogenous Growth Theories emphasize that FDI has a major role in promoting growth in the host country. Lan (2006: 925-933) stated that FDI is a way to transfer knowledge, bring in technology, economic growth, enhances domestic investment exports, labour growth and human capital growth. Technology-Gap approach deduced that by transferring environmental friendly techniques of production in the form of FDI has positive effects on environment of developing countries (Hassaballa 2013: 75). Simon Kuznets in 1955 stated that as the per capita income levels rise, the people begin demanding a cleaner environment by creating political demands for tougher environmental standards (Jeffrey 2009: 3).

Contradicting the above line of thought, various researchers consider FDI of being a major factor in resource depletion, environmental degradation and welfare loss. The argument against FDI is supported by the Pollution Haven Hypothesis, which asserts that the environmental standards and regulations are relatively lax under globalization in developing countries. Thus these pollution havens have low domestic expenditure on environment protection (Copeland and Taylor 2003: 9-10). The weak environmental regulations made developing countries a prime destination for trade and investment. Similarly in the classical trade theory of comparative advantage, lowered (less stringent) environmental laws decrease the cost of production and vice versa. Therefore, these countries with lenient environmental laws and regulation are bound to have a comparative advantage in the production of polluting goods.

As seen above both arguments are strong and are supported by theories and researches. The detailed analysis of literature will give theoretical support to both sides of FDI. The next sections (II.2 and II.3) of the thesis will analyze in detail the positive and negative impact of FDI in developing economies such as India with the support of previous researches.

II.2 Foreign Direct Investment and its Positive Effects

Advocates of FDI argue that positive effects of foreign investment can be seen on the welfare of the host country because of the environment friendly production practices that are imported from the developed countries. Several studies have opposed the validity of Pollution Haven Hypotheses in a post-liberalized India. Mathew (2014: 3-4) found that to compete with international standards of goods and services, India attracts new technology and investments. It is found that every new technology is better and more efficient than the previous one and increases production with better quality, decreases the emission level, increases trade openness, provides better environment performance etc. Golub (2011: 7-9) mentioned in his research that the common assumption that Asian countries are less aware of green technology is wrong. FDI restrictions on green sector are higher in Asian countries as compare to South American and European countries. In case of India, overall FDI restrictions are higher in many sectors, which indicates that India is encouraging FDI in green sectors and easing the rules and regulation in green sectors. Zarsky and Gallagher (2008: 1-20), found that multinational enterprises are very particular about environment of the host country and operates with company-wide environmental standards. Hence when FDI flows from a country with higher environmental standards to countries with lower environmental standards, the net impact emanating for them is green. This clearly shows that FDI enters a host country's territory with better and green technology.

Furthermore Golder and Banga (2007: 4-24) in their paper titled "Impact of Trade Liberalization on Foreign Direct Investment in Indian Industries" show that liberalization of trade had has a positive impact on Indian industrial sector because of lowering of the tariff rates and cross border trades. While the intra- industry trade was not significant for FDI, the trade related to cross border vertical integration were favourable for FDI. In a study titled "Does Foreign Investment Harm the Host Country's Environment? Evidence from China", Liang (2006: 1-12) used Ordinary Least Square model to conclude that economic openness is important and beneficial to host country's environment and found

no evidence of harmful impact of trade. He posited that the foreign owned industries use superior and energy efficient technology of production.

In another phase of study performed by Mukhopadhya and Chakraborty (2005: 110-111) in their paper titled "Is Liberalization of Trade Good for Environment? Evidence from India" developed an index for trade in India in terms of pollution. The results showed that India is producing more environment friendly goods than the goods it is importing from the developed countries. Aliyu (2005: 1-21) found similar results as Eskeland and Harrison (2002) and reveals that FDI helps in reducing the pollution levels of the developing countries because of the use of more environmental friendly techniques brought in as part of the foreign investment. The study further concludes, PHH occurs only for closed economies; but in the case of free economies FDI always accompanies more efficient environmental techniques that help in reducing the pollution and exploitation of resources. The finding of Eskeland and Harrison (2002: 2-28) also strengthen the belief that in developing countries FDI is able to reduce pollution by using ecofriendly production techniques from developed countries that they say are "significantly more energy efficient and use cleaner types of energy than local firms".

Bhaumik et al. (2003: 83-114) analyzed 160 multinational companies operating in India and the environment they are experiencing here. The results show that these MNCs have had good experience in India in terms of labour productivity, growth and profits. It is also noticed that over time local and state governments of India are also co-operating with these foreign companies without creating any hurdles. However it was found that MNCs in India do not give proper training to employees and keep their research and development budget very low which is one of the spillover effects. Agreeing with this line of thought, Copeland and Taylor (2004: 9-10) in their article "Trade, Growth and the Environment" make a case that rigorous environmental laws are not an appropriate instrument to see the effects and the direction of FDI. Thus the Pollution haven effect may be possible temporarily, but its long term existence may not be entirely true. Copeland and Taylor performed a research with Anteweiler(2001: 880-902), in which they investigated the relative strength of the three effects (scale, composition, and technique effect) and concluded that free trade has a net positive impact on the

environment. The Technique Effect is used to "measure the change in aggregate pollution or environmental degradation arising from a switch to more environmentally sustainable production technique such as constant Scale and Composition effects". This explains the tendency for higher income nations to place a huge importance on cleaner environments. At a global level, increase in free trade is linked to an increase in world income, which further pushes up the demand for a better environment. In a study by Chakraborty and Basu (2002) on India they used a non-structural time series model (i.e., Vector Error-Correction) to explore the dynamic interaction between FDI and economic growth. The duo noticed that the India's GDP has short and long run significant positive effect on FDI inflows. According to PWC (2012: 4) FDI brings unprecedented exposure and variety to brand and quality goods; for instance since 2003, 100% FDI in education sector has enhanced education levels through foreign schools, colleges, and universities in India. Liberalization has also reduced income inequality.

According to OECD (1998b: 9-17) report there are three main components of FDI which impact environment and those are: Countries with low incomes often attracts pollution intensive and resource seeking FDI because they have the capability to absorb pollution and have abundant resources and hence possess comparative advantage. Secondly, according to Kuznets's argument, environmental quality will increase as a consequence of the demand of people with rising income levels. Lastly, newer technologies in developed countries tend to be more energy efficient and have lower environmental footprint. Thus encouraging FDI improves the net environmental performance of the host country. In the same year Goldemberg (1998) also stated developing countries might be able to skip the damaging pollution intensive phases of industrialization directly by passing old technology and bringing in cleaner technology from developed countries in the form of investment. Hence trade openness leads to reduction in pollution emissions and under greater competitive pressure host economies gain more environmental awareness.

In a study by Blomstrom, Magnus and Kokko, Ari (1997: 4-35) in their article "The impact of foreign investment on host countries: A review of the empirical evidences" FDI

was found to not only promote economic development but also contribute to the productivity and exports of the host countries. They also added in their finding that industries and policies of the host countries determine the benefits of FDI. Gupta et al. (1995) said that the strictness of environmental laws increase with increasing economic development and income levels. India is among those countries that contradict the Pollution Havens Hypothesis with change in the environmental laws. Hence, liberalization should be encouraged through the production of environment friendly goods and exports promotion.

The economic theories that support the argument in India's case are Classical trade theory of comparative advantage, which treats the environment as another factor of production. The endogenous growth theories, technology-gap approach and Simon Kuznets approach also support this theme.

II.3 Foreign Direct Investment and its Negative/Mixed Effects

The relationship between FDI inflow and the environment is not simple. The impact of foreign investments post liberalization is still a hot topic for debate. A few environmentalists and economists assume that opening up economic borders leads to increased pollution levels in developing countries. Liberalization is known to cause the movement of pollution intensive dirty industries from the developed countries to the underdeveloped and developing countries. This further reduces their environmental standards and results in environmental degradation and industrial pollution. The Pollution Havens Hypothesis believes that the movement of capital and free trade results in the movement of dirty industries from countries with tight environmental laws to countries with more relaxed environment. The various studies focused on the negative impact of foreign investments on host countries are described below:

Chakraborty in his paper titled "Does Pollution Havens Hypothesis Hold Good for India? Evidences from Cross-State FDI Inflows Patterns" using used regression analysis and found that Industrial Entrepreneur Memoranda (IEM) in India is generally pollution intensive which is affecting the inflows of FDI to dirtier regions. If this

environmental deterioration continues it will give encouragement to developed countries to continue their dirty production in the host country. In contrast to that, existence of PHH was not available in case of India which shows that state is not encouraging FDI in pollution intensive sectors and that is why it is not affecting the environment. Thus in case of India, the regulatory mechanism of the government controls the environment harming impact of trade and investment.

Study conducted by Pao and Tsai (2011: 1-10) by using panel co integration techniques found mixed and positive effect of FDI on CO_2 emissions for Russia, Brazil, India and China during 1980-2007. The results enforce the PHH by demonstrating a positive relationship between FDI and CO_2 emissions. That means higher inflow of FDI leading to greater carbon emission in above mentioned countries. Their research also conducted a Granger causality test which proves the existence of a bi-directional relationship between FDI and CO_2. Acharyya (2009: 5) in her research "FDI, Growth and the Environment: Evidence from India CO_2 emission during the last two decades" using cointegration regression found that during 1980-2003, FDI inflows in India is positive and had marginalized long term impact on GDP. She further added that the results obtained from cointegration test shows that FDI has a positive impact on CO_2 emission through the productivity growth. The study also demonstrates the weakness in PHH as it was unable to explain the rise of FDI in the 1990s. She also added the fact that the outcomes of environmental degradation could be slightly different if different pollutants were used.

Furthermore, Baek and Koo (2009) in their research paper titled "A Dynamic Approach to FDI- Environment Nexus: The Case of India and China" analyses the interrelationship (Short and long term relationship) between foreign direct investment, environmental quality and economic growth in India and China using ARDL approach (Autoregressive Distributed Lag Approach). The results obtained in case of China shows that FDI and CO_2 emissions have a positive relationship in long run and short run. This means that FDI is adversely affecting the environmental level in China but no direct evidences of pollution havens hypothesis were found. On the other hand in case of

India, FDI has a short run impact on environment but in long run very little impact was observe. Furthermore, in case of India and China, GDP growth and CO_2 emissions has positive relationship which clearly means that more economic activities are generating income on the one hand, and environmental degradation on the other. Mukherjee and Chakraborty (2009: 20-40) in their research paper "Environment, Human Development and Economic Growth: A Contemporary Analysis of Indian States" mentioned that as the income in an economy increases, human development level also rises and with that so does the demand for a cleaner environment.

A year later Chakraborty (2008) in his paper titled "Impact of Stringent Environmental Measures on India's Export" stated that the economic reforms were initiated in 1991 and were based on the export-oriented growth model. As a result, the importance of exports and foreign direct investment has increased in GDP growth. The author also suggested that due to increase in FDI inflows and merchandise exports, PHH exist as environmental sensitive goods are among the list of top exports in India. Aliyu (2005: 1-21), created an econometric model that was used for 1999-2000 to measure the impact of environmental regulations and laws on the outflows of 11 developed OECD countries and 14 non-OECD developing countries. He found, increased total energy use and increased pollution emission mainly in the form of carbon dioxide, resulting in increase in temperature. Using panel data regression, the following results were derived: firstly there is a positive correlation between FDI outflows and strictness of environmental laws for polluting industries and secondly the inflows of FDI in developing countries do not significantly impact the energy usage and pollution emissions, with the exception of CO_2 where it was found to be positive and significant in 14 developed countries.

Furthermore, Dean (2004) in his paper titled "Foreign Direct Investment and Pollution Havens: Evaluating the Evidences from China" stated that weak environmental regulations attracts Southeast Asian developing countries to have joint ventures with China. While, joint ventures from industrial countries such as USA, UK and Japan regardless of the pollution intensity are attracted by strong environmental levies.

According to Mathys (2004), the globalization of Indian economy has been associated with increased activity in polluting products. Jha (2004: 1-16) too found in her article that trade liberalization has stimulated economic growth and has simultaneously led to degradation of the environment. This happens because of the relocation of industries from locations with strict environmental regulations to locations with lower environmental standards. This increasing free trade with weak environmental policies has adversely affected the environment. Jha and Rabndran (2004: 1-16), found that as compared to the pre liberalization period, the FDI and exports share in the post liberalization era has grown more in polluting industries relative to less polluting sectors. In the same year Gupta (2000: 1-10) examined the effects of liberalization on the environment specifically in the automobile sector through a case study. He collected various industry-level economic and environmental data, which was then aggregated at the all India, level from various Indian government agencies by using a unique database. He concluded that India has been facing environmental challenges in automobile sector.

Grey (2002: 1-7) in his article "Foreign Direct Investment and Environmental Impacts- Is the Debate Over?" using various hypotheses like pollution havens, Race to Bottom and Race to the Top found that foreign investors do not give importance to environmental factors in deciding the relocation of their industries. Though no such evidences were found which prove that the host countries lower down their environmental standards to attract foreign investment; there is still a concern that this can be a reason for a race to bottom approach amongst the companies. Hence the lowered environmental concern may be one of the reasons for attracting FDI to host countries. Dean (2004) again estimated the impact of trade liberalization on the levels of water pollution in Chinese provinces. He used a simultaneous equation system to prove that trade worsens pollution through improved terms of trade but cancels it via income growth. In a study by Xing and Kolstad (2002: 1-22), the impact of the FDI originating from USA on the quality of environment in both the developing and developed countries was examined. They discovered that the developing countries usually deploy relaxed environmental regulations in order to attract trade from the pollution intensive industries located in the developed economies. In 2006, they repeatedly explored the link between

environment and FDI in China and found evidence of increased FDI inflows leading to environmental degradation.

Levinson and Keller (2001: 1-27) estimated the impact of the change in environmental standards and cost of pollution by looking at FDI to the United States of America. Following the patterns of international investment they found evidence that increasing costs of pollution have had a slightly detrimental effect on foreign investments. In a study Gupta (2000) and Tewari (2001) said that the previous studies on the impact to environment post liberalization in India have generally been just descriptive studies focused on a very small section within the manufacturing industries.

Mabey and McNally from World Wide Fund for Nature (1999: 3-9) mentioned in their study that FDI is considered as one of the most powerful tool since 1990s but the environment has also come to be an important matter of concern globally. They noticed through evidence that the industrialized countries shift their operations to countries where the environmental standards are lower. They further added that FDI on the one hand encourages economic development of the host country. Pollution intensive industries are locating to those countries where environmental standards are less stringent. It is believed that increasing global competition encourages the maintenance of low environmental standards by the host country. In 1999, Jha reviewed the literature on the applicability of Pollution Havens Hypothesis in India and observed negative environmental performance by transnational corporations during 1990s. She found a higher FDI inflow in polluting sectors in the post-liberalization period.

According to UNEP Report (1999), India adopted a policy of liberalization and structural adjustment reforms in July 1991 to improve economic efficiency. Prior to 1991, there were several bureaucratic hurdles that blocked foreign investors from investing, for example the mandatory approvals that were required from the different ministries, and the requirements related to transfer of technology nearly stopped foreign investment in India. This trend changed after 1991; the ease of entry to Indian market was improved with the liberalization norms that created an automatic approval process. The aim of new

economic policy was to create more productivity, efficiency and competitive environment for investment and trade. Jones and McNally (1998) explored the negative effects of FDI on the environment. They evaluated both sides of the argument – considering pollution havens and providing reasons why foreign national companies do not cause environmental degradation. They stated that in industries involving resource extraction, the companies tend to move towards countries with relaxed environmental laws.

Copeland and Taylor (1994: 755-87) found that "more trade probably means more production, and that has historically meant more pollution. Moreover, as dirty industries have the tendency to migrate to countries with low wages and lax environmental standards, trade liberalization would have important consequences for the international distribution of polluting industries". Kennedy (1994: 49-63) in his paper titled "Equilibrium Pollution Taxes in Open Economies with Imperfect Competition" argued that Free trade in developing nations influences the government to ease their environmental standards only to gain competitive edge over their trading partner countries. Hudson (1992: 55-64) in his paper "Trade, Environment and the Pursuit of Sustainable Development: The Greening of the World Trade" argued that in the long run concerns related to trade and environment should be simultaneously factored in to avoid environmental policies becoming unsustainable. Researchers like Levinson and Taylor (2001), Grossman and Krueger (1993), Mani and Wheeler (1999), Copeland and Taylor, Sudarshan (1998) etc. created a considerable debate and discussion on the environmental impacts of liberalization policy.

Similarly, various studies have been performed to analyze the effects of FDI on Indian growth, societies, geography and environment found mixed results. Dinda (2004: 431-55) stated that to attract FDI inflow, developing countries keep their environmental regulations weak which results in various spillover effects and externalities. The opposite of this relationship was observed in the theory of Environment Kuznets Curve (EKC), which describes inverted-U relationship between output growth and the level of pollution. Lastly, a study by Panayotou (1993: 1-39) found mixed results and points out that the global growth in population has led to an increase in production outputs. This further

increases the wastes that are created as by-products of the production activities. As the pollution intensity increases, the exploitation rate of resources also increases. To ensure sustainability it is important to use cleaner technology as a substitute of the outdated polluting production technology in countries such as India that are transitioning from an agrarian to an industrial economy.

Similar to FDI-trade linkages, FDI-environment linkages, FDI-geography relationship, FDI and Society has a strong linkage which is important for this analysis. Most literature in this area analyzes the relationships between FDI, multinational corporations, and its impact on society. For instance, OECD (2008: 1-8) stated in a policy brief titled "The Social Impact of Foreign Direct Investment" that FDIs are more advantageous for host countries than domestic firms as they create high quality jobs, higher pays in better quality work conditions for the host economies people and society. The MNCs provide incentives to not only ensure productivity but also to ensure the quality of work. Domestic firms should also learn from MNCs through collaborations about supply chain and efficiency improvement.

Hippert (2002: 861-69) examined social impact of FDI and claimed that it negatively impacts the society. He claimed that MNC's and FDI players down grade the sovereignty of the developing economies and also cause harm to the economic and social status of women since they bear the maximum brunt of poor labour conditions as seen in Asia and Mexico. In contrast to the above negative viewpoints, Rondinelli (2002: 391-413) highlighted the positive role multinational companies' play towards societal upliftment. The research focused on the MNC's role of philanthropy and social activism. MNC's are also able to exert pressure on the government for the good of the public. Spar (1999) on the other hand took a neutral stance claiming that the relationship between FDI and human rights is very complex. FDI, according to Spar, has both positive and negative effects. He concludes that, in the larger scheme of things, an increased collaboration between the government and the MNC leads to social prosperity and economic development and explained that in this age of social networking and information technology, foreign companies have a lot to lose in credibility if they exploit the environment or the workers. As an example, companies such as Royal Dutch-Shell, Nike

and Avon have enhanced their efforts towards compliance with corporate policies governing labour conditions and environmental footprint. The studies mentioned here clearly shows that the society plays a key role in the absorption of FDI in the economy. Any negative impact of FDI will lead to protests in the society and people and thus the shunning of FDI. The government plays a crucial role in moderating the balancing act between the extraction of resources and the upliftment of society.

Therefore, with the help of reviews of literature on the theme, mixed results are obtained where some favour the FDI and the rest are against it. Drawing a single conclusion in Indian scenario would be difficult and thus in the upcoming section, empirical evidences will be explored to enable us to better understand the impact of FDI on the environment in India. With the help of these results a short and long term impact of FDI can be drawn establishing a potential link between FDI and the quality of environment in India.

II.4 FDI and the Environment: Empirical Evidences from India

While analyzing the huge literature on the topic, it was found that studies conducted previously have ignored the endogenous nature and the possibility of a causal relationship between FDI and the quality of environment. Very few studies have analyzed the dynamic movements of the relationship between Foreign Direct Investment and environmental quality. Thus in the light of theoretical background of the variables (GDP, FDI, Trade, CO_2, & Energy consumption) it is clear that the relationship between these variables cannot be neglected or passed over.

The objective of this empirical analysis is to see the long run causal relationship among the variables in India. The six variables chosen for study are GDP, FDI inflows, CO_2 emission, energy use, exports and imports. These variables are chosen as proxies of different economic indicators. For instance GDP is a proxy of economic growth, exports and imports are proxy of international trade or external implications, FDI is used as a proxy of investment, and CO_2 and energy use are the proxy of environment. Selections of the variables are based on the objectives behind them, for instance GDP is the measure of economic activities (Production and transaction of goods and services) in an economy. The growth takes place when the economic activity in the form of transaction of

consumer and government goods and services increases in the economy. That is why GDP is chosen as a proxy of economic growth.

Similarly, export and imports are indicators of trade because the exchange of goods and services takes place both ways. Further, CO_2 is an important indicator of air pollution, global warming and environment pollution. It causes adverse effects on environment, health, and society by making weather and climate warm. Energy consumption is another indicator used as for environment quality because the sources of energy like fossil fuels (Coal, Natural gases and oil) and also nuclear energy could adversely affects the economy, health and environment to a large extent. Hence the conventional sources of energy are used in this analysis. Lastly the important variable of the analysis is FDI which is as an indicator of investment. The data for various indicators are kept the same and collected from World Bank development indicators. The time frame chosen for the analysis is 1975-2010 and is based firstly on the desire to study relationship between the various variables over a considerable length of time. Secondly, this helps to analyze the relationship among the variables before and after liberalization.

The analysis involves checking the stationarity of the variables at different levels of significance. The Augmented Dickey Fuller tests[12] are used to test the stationarity of the variables. For further analysis all the variables should be stationary at similar levels otherwise it becomes difficult to carry out any meaningful econometric exercise. Once all the variables are stationary Johansen cointegration technique[13] is used to establish long run relationship among the variables. Then an Error Correction Model[14] was run to check

[12] The Augmented Dickey Fuller (ADF) test checks whether the unit root is present in time series sample or not. ADF is used for large and complex time series to check the stationarity. Stationarity is a statistical property of times series which is constant over time. For example mean, variance etc are constant over time. (Dickey 1979: 1-12).

[13] Johansen cointegration is a procedure of testing cointegration of time series. It is a statistical property of two non stationary time series (X and Y) which becomes integrated or stationary I (1) when differentiated. Other linear combination of stationarity is I (0). These order of integrations among the multiple time series is known as cointegration. Such cointegration situation describes a long run equilibrium relationship among the variables. Examples of cointegrating pairs are Income and Consumption, police force size and criminal activities amount etc. (Johansen 1991: 1571-76).

[14] Error Correction Model (ECM) is a type of multiple time series model used when the short term and long run cointegration relationship among the variables exists. Suppose there are two variables X and Y, ECM

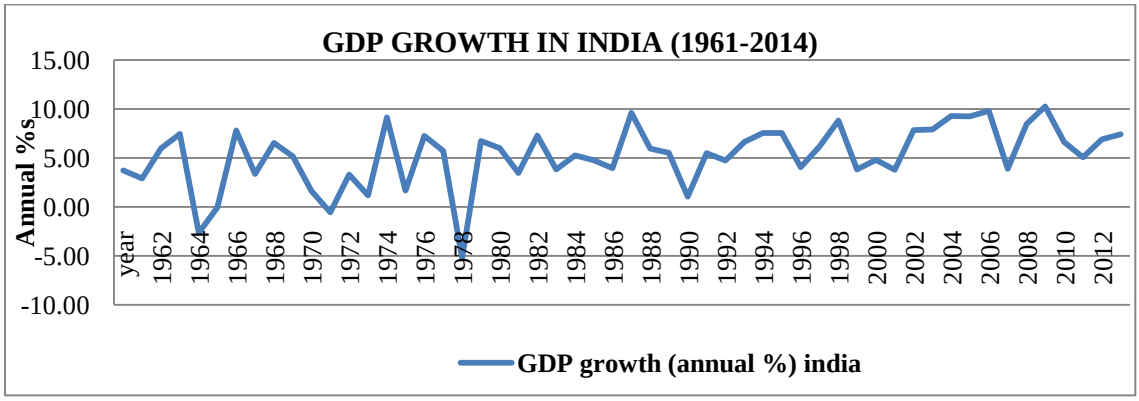
the short run and long run magnitude of relationship among the variables. Last but not the least Granger Causality test[15] is used between the variables to test the direction of causality.

For attaining the objective, there are four subsections. The first subsection will deal with the time series trends of various variables, followed by the empirical investigations (Cointegration, Error Correction Model and Causality) of the variables with the help of an econometric model. The empirical analysis will help us in developing an understanding the real work implications of the adoption of liberalization and FDI inflows in India.

II. 4 (i) Backgrounds and Trends in India[16]

This analysis will begin studying the trends of variables (FDI, CO_2, Trade, Energy and GDP) in India. India has adopted economic reforms since 1991 and the major change in the trends of these variables can be easily seen in the graphs since then.

Figure II.1: GDP Growth in India (1961-2014)



Source: Researcher's Computation based on World Bank Database.

helps in estimating directly the speed and quantum at which dependent variable (X) return to equilibrium after a change in Y (Kilian, L. et al. 2016: 73-75).

[15] Granger (1969) proposed "a time series data based approach to determine the directions of the relationship among the variables". This test helps in forecasting. According to this concept of X granger causes Y, then the past value of X helps to predict the information of Y. Its formulation is based on linear regression model. The different directions for these purposes are unidirectional, bidirectional and lack of causality (Granger 1969: 429-30).

[16] All FDI, Exports and Imports data are in Million US$.

Beginning with GDP growth in India, Figure II.1 shows the patterns of GDP growth from1961 to 2014. The curve clearly shows fluctuating trends since 1961. Since India became independent in 1947 economic activities have increases leaps and bounds. The growth showed rapid ups and down till the 1980s with few years such as1965 (-2.64%) and 1979 (-5.24%) recording negative GDP growth as well. The reason of the negative GDP growth is attributed to droughts of 1965-66 and 1979-80. In 1981, GDP increased to 6.01% per annum. This was the recovery phase of GDP growth and acceleration. In 1988 the GDP growth in India showed the highest level since 1961 of 9.63%. The Indian economy has shown a strong recovery in agriculture production and sustained growth of industrial sector. This was also the time when the key infrastructure sectors were performing well, wholesale price index (WPI) had dropped by 10% in 1988 and inflation rate in terms of consumer price index had declined (Union Budget 1988:2).

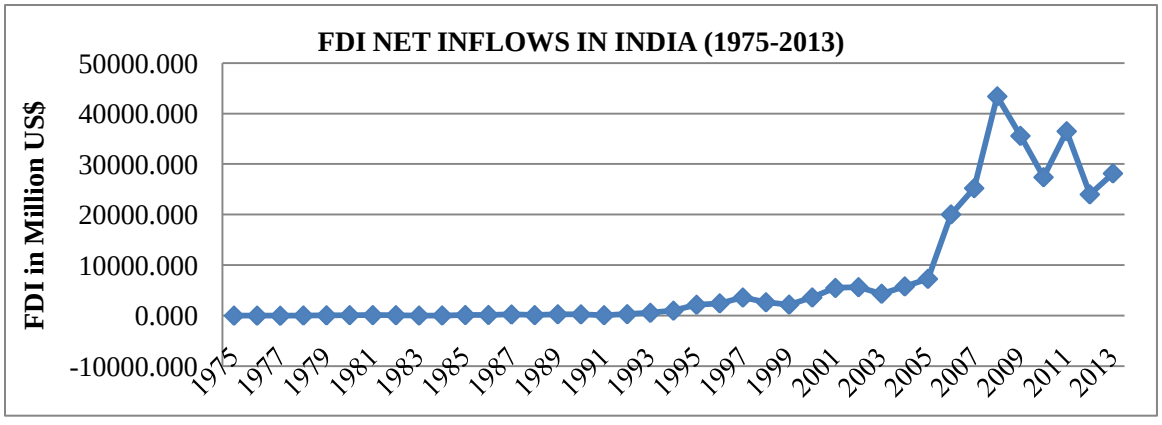
India adopted economic reforms in the form of liberalization in 1991; in 1991, GDP was recorded at 1.06% that was also the time when India was quickly recovering from the 1991 crisis and the stabilization effort was followed. Furthermore, in 1996 it reached growth of 7.55%. The 1990's was the decade when the overall economic environment in the global arena was favorable. India though, still faced severe balance of payment crises, and foreign exchange reserves that would not last beyond two weeks. This increased the vulnerability to external shocks. Again 1997-98 were slow GDP growth years because of fallout of Asian economic crisis (Anand 2014:19).

During year 2000-02, the emergence of the dotcom bubble and 9/11 event impacted GDP in India to some extent. In 2003-2007, India continued to maintain the GDP growth of approximately 7% and 9%. 2008 is an important year to analyze since it witnessed global economic crisis caused the GDP to close at 3.89%. The global crisis was due to collapse of Lehman Brothers (the world's largest insurance company); it affected India in the middle of its cyclical economic nadir. The collapse led to a withdrawal of foreign institutional investment (FIIs) in order to provide liquidity to the parent organizations in Europe and US (Kumar 2009:8). 2009 recorded a commendable growth of 8.48% owing to recovery from global economic crisis. In 2010 GDP growth reached the two digit value of 10.2% which was due to the high growth in transport,

communication sectors, financial sector grew and impressive agricultural growth (Shankaran et al. 2012: 128). The trend of GDP shows decline of 6.64% in 2011 and in 7.4% 2014. The low GDP of 2011-12 was due to the slowdown in construction and mining industries. The sustainable growth since 2008 has now made India an "upper middle income country" instead of lower income country (The Hindu, July 3 2015).

Figure II.2 reveals the trends of FDI inflows from1975 to 2013. The FDI pattern reveals some volatility; this was due to major structural reforms along with the large scale liberalization of exchange rate and international trade. Chapter I of the thesis has dealt with the FDI trends, composition and directions in detail since 1970s. The graph also clearly shows a stagnant and slow growing trend of FDI till 1996. FDI was almost negligible till late 1980s due to restrictions on foreign investment in India. In 1991, India adopted liberalization policy along with significant liberalization of the international trade and exchange rate policies. The FDI inflow was recorded at $276.51 million just a year after the adoption of economic reforms. Since then a growing trend of FDI inflows can be easily observed in the graph. The share of FDI was much lower than the most of world countries before 1997. In 1997, FDI has made substantial growth of $3577 million in 1997, due to the liberal policy adopted by the government favouring FDI. RBI revamped the application and approval process for financial and technical collaborations providing automatic approvals to many industries in India.

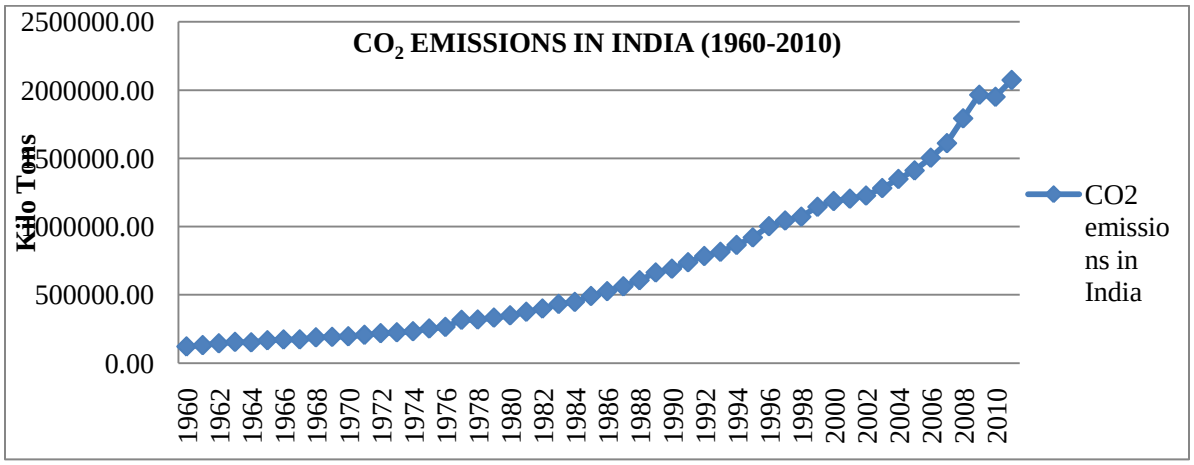
Figure II.2: FDI Inflows in India (1975-2013)



Source: Researcher's Computation based on World Bank Database.

The upward rising trend of FDI continues since 2003, while during 1998-2002 the FDI has gone through frequent ups and downs. In 2003, it was recorded at $4322.74 million which grows to $7269.40 million in 2005. Various measures were taken to encourage FDI inflows including liberalization of equity capital, 100% FDI in tea industry, 100% liberalization in petroleum products marketing and many more (Raju, Rama K.S.S 2010:116). 2006 recorded speedy growth of $20029 million. The main reason of increase was approval of FDI in retail sector; which gave a sudden boost to the inflows. 2009 recorded 35581.37 million, while the economy was recovering from world economic crisis and managing to overcome from fragile foreign investments. India became a preferred investment destination of developed countries over the years still the slowdown of investment in recent years can be seen ($36498 million in 2011) and further decline to $28153.0 million in 2013. The reason of slowdown inadequate steps to open more sectors for investments which hurt the sentiments of investors, limited availability of long term capital, higher inflation rates and interest rates which ultimately lead to the deterioration in FDI (Carnegie Europe: April 18, 2012).

Figure II.3: CO_2 Emissions in India (1960-2010)



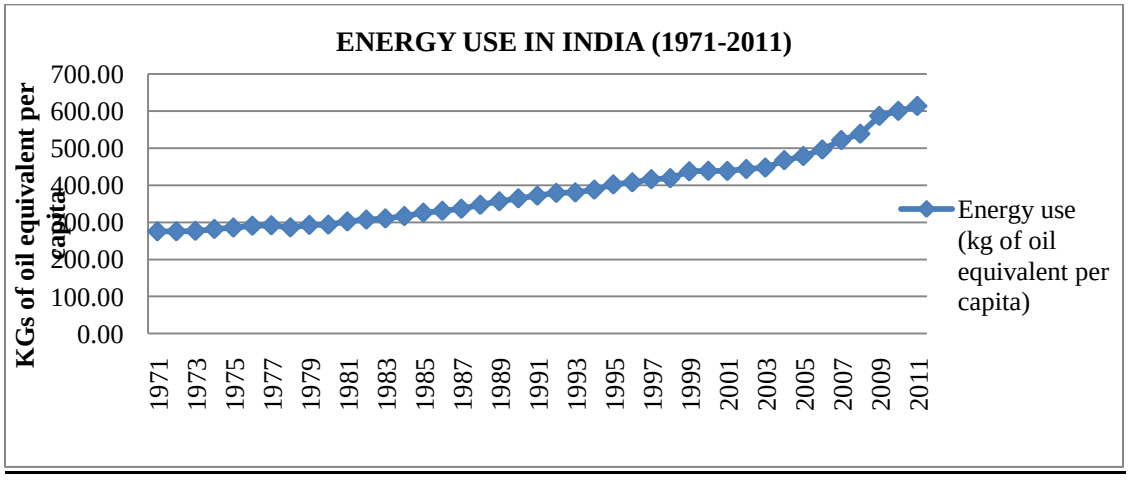
Source: Researcher's Computation based on World Bank Database.

Figure II.3 shows the Carbon emission trends since 1960s till 2010. The graph has an upward rising trend which first of all shows that CO_2 emission has rapidly increased in India and with impact on deterioration of environment. India has experienced a multifold

growth in emissions of CO_2 (average growth is 5.7%) and has become the third largest fossil fuel CO_2 emitting country. The data reveals that CO_2 emission increased very rapidly from just 120,581.98 Kt (Kilo Tonnes) in 1960 to 195,143 Kt in 1970. In 2000, the CO_2 emission was 1,186,663 Kt, which is just double that of 348,581 Kt (1980) and to 690,576 Kt (1990). Since 1991, economic reforms have increased the economic activities in India in the form of production, distribution, investments, supply etc. which consumes more energy and results in carbon emission which has more than doubled and reached 7 digits levels.

The major source of emissions by fossil fuels in India is the burning of coal. India also happens to be the third largest coal producer in the world. According to BP Statistical Review, India closely follows US and China in emitting CO_2 (TERI, 2015: 1). In 2005 the emission intensity increased by 35% and was recorded at 1411127.60 Kt. In 2010 India emits 2,008,823 Kt, which is again an exponential growth since 2000. Based on its heavy emissions, India has promised to the global forum that it would start generating 40% of its electricity from renewal and non-fossil fuel sources such as solar, wind and nuclear by 2030. For this, India has asked for help from the developed countries (Hassol 2007: 4).

Figure II.4: Energy Use in India (1971-2011)



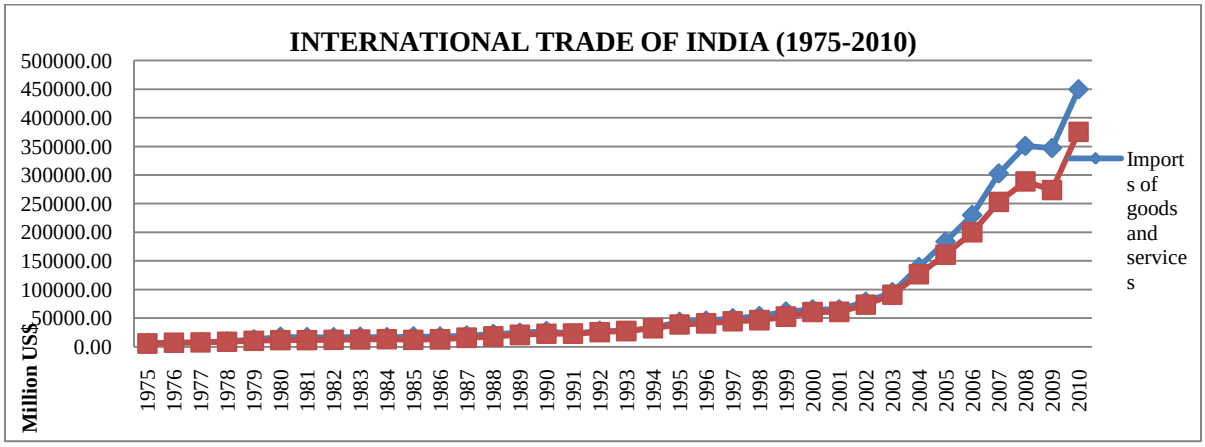
Source: Researcher's Computation based on World Bank Database.

Figure II.4 shows the trends of energy consumption from 1971- 2011 and similar to carbon emission; energy consumption has seen a speedy upward rising trend. It was recorded at 275 Kilo Tonnes in 1971 and grew to 302 Kilo Tonnes in 1982. It is clear from the data that the consumption from 1977-1980 was increasing at slower rate while 1981 onwards the rate of consumption grew at much faster rate. Such pattern of energy consumption clearly shows that before 80's, economic activities were not as vibrant as in the 90's.

A positive correlation is observed between economic activities and energy consumption; higher the economic activities, greater will be the energy use in an economy and vice-versa. Hence in the 1990s when the economic reforms encouraged economic development, large-scale industrialization and urbanization, rate of energy consumption rose to 371.74 Kilo Tonnes in 1991 to 402 Kilo Tonnes in 1995. Within 5 years of liberalization, energy consumption grew at a rate of 100%. Being a developing country, India faces the drawback of less capital, less modern machinery, obsolete technology etc. which create a high propensity to consume energy. Year 2007 onwards the consumption level saw a 200% increase and was recorded 521.67 Kilo Tonnes, further increasing to 600.31 Kilo Tonnes in 2010 and 613.72 Kilo Tonnes in 2011. In recent years India has shown a keenness to improve the energy efficiency by diversifying its fuel types. With the growing population, demand for energy is increasing at geometric mean and it is assumed that if India will proceed with this path soon it will be most polluted country as well (Hubacek 2007: 9).

Figure II.5 shows the trends of exports and imports in India since 1975 to 2010. The amount of exports and imports show a rising trend. A sudden rise in the trade can be seen since 1991. India also has also faced trade deficit in international trade since the beginning. India is the largest producer of petroleum, pearls, gold, Iron and steel, cotton fabrics, pharmaceuticals, aircraft space crafts and parts, and exports to various countries of the world including USA, UAE, Hong Kong, China, Saudi Arabia, Singapore, UK, Germany and many more (EXIM 2015: 1-2). The exports were recorded at $5560.86 million in 1975 which further rose to $11439.61 million in 1980.

Figure II.5: International Trade in India (1972-2014)



Source: Researcher's Computation based on World Bank Database.

India's export sector has demonstrated considerable growth in the past years and continues maintain its trajectory. Exports grew at an exponential rate post 1991, and were recorded at $22943.41 million; doubling in 1996 to $40802.99 million. In year 2000, export earnings were recorded at $60878.40 million, which grew to $288902.15 million in 2008. 2008 was the year of economic crisis. In spite of the challenge to the export sector posed by the global meltdown, the merchandise exports were recorded at a respectable $375353.47 million in 2010. IMF's World Economic Outlook October, 2011 stated that "world trade recorded its largest ever annual increase in 2010". According to WTO International Trade Statistics (2010), India was ranked 20th among the exporters and was the 13th largest importer in the world with a share of 1.4% and 2.1% in 2010. Year 2011 was a troubling year for trade for many reasons: Japan was affected by Tsunami, there were uprisings in the oil producing countries in the Middle East, the US and European economies cooled down (Ministry of Commerce and Industry 2012: 1).

On the other side import is also an important variable of trade and the major countries from which India imports are China, Saudi Arabia, UAE, Switzerland, USA, Indonesia, and South Korea etc. The major commodities of imports are mineral oils and fuels, telecom, peals and gold etc. The principle imports in India are classified as food and allied products, Raw materials and intermediate manufacturers, capital goods and other goods (Singh 2000: 5). The imports value was recorded $6545.39 million in 1975

which grew to $17225.93 million in 1980. In 1990 it was recorded at $27132.07 million and doubled in 1995 with the amount of $43318.36 million. The increased imports are due to the increasing oil prices and increasing demand for it the country. The growing population creates higher spending on gold, gems, oil and petroleum, machinery etc. In 2001, imports of India reached $65218.41 million. The main import commodity, fuels and mineral oil raised the imports amount heavily. It increased to $139310.17 million in 2004 and further after six years to $449974.32 million in 2010. During 2011-12, India created policies that were aimed at limiting the import of gold. In 2013-14, a decline in imports from the United States was attributed to the decline in gold and silver imports as well as the moderation in imports of machinery (Reserve Bank of India 2014: 3).

II.4 (ii) Results and Discussions of Empirical Analysis: India

- ***Modeling of FDI-Environment Nexus***

To examine the dynamic and complex relationship between international trades, FDI, GDP, CO_2 and energy use in India, a policy model based on FDI-environment was developed by Xing and Kolstad in 2002. FDI in the host country in the simplest way can be specified as:

$$\mathbf{FDI = } f_1 \mathbf{(Exports, Imports, GDP, } Z_1, R^*\mathbf{)} \qquad \text{----- (1)}$$

Here, exports and imports are indicators of international trade, GDP is gross domestic product which is an economic growth proxy; Z_1 is a vector of exogenous variables affecting FDI inflows. These exogenous variables can be defined as cost structure, labor costs, environment indicators, and rewards of factor services differentials. R^* is the indication of lax environmental regulations. The relationship between FDI and R^* which is expected to be positive indicates lax environmental policy which could attract more to pollution-intensive foreign investments, thereby adversely impacting the environment in the in the host economy.

Similarly, the environment indicators (E) such as CO_2 and energy use can be specified as:

$$\mathbf{E = } f_2 \mathbf{(FDI, Exports, Imports, GDP, } Z_2, R^*\mathbf{)} \qquad \text{----- (2)}$$

Here Z_2 is a vector of exogenous variables such as prices, water pollution, land use, energy consumption, fossil fuel use that are affecting pollution levels in environment. R^* is the indication of lax environmental regulations. The relationship between environment and other indicators (FDI, Exports, Imports and GDP) is expected to be positive which indicates that increase in the economic activities through trade; economic growth, investments and income growth proportionally increase the environment use. Also the relationship between E and R^* is expected to be positive which implies that lenient environmental regulations leads to increase in deterioration of the environment.

- ***Stationarity***

The first and foremost step of the analysis is concerned with the stationarity of the variables. The Augmented Dickey-Fuller test (ADF Test) is conducted to check the unit root of the variables. It is the first and foremost condition of Granger Causality that the series have to be covariance stationary (Danladi and Akomolafe 2015: 166). The result obtained from unit root test shows all variables are non-stationary at level, I (0). This means that the variables are trended and deviated from the true mean. However all the variables found stationary at first difference, I (1). The MacKinnon (1996) one sided p-values for the Augmented Dickey-Fuller (ADF) test are 0.00 for CO_2 emissions, energy consumptions, FDI inflows, GDP, exports and import respectively at 1%, 5% and 10% significance level. This signifies that the null hypothesis of presence of Unit Root has been rejected for all the first difference variable specified. The results of stationarity are presented in Table II.1 of the appendix II.

Since all the variables are stationary at the same order, a cointegartion test can be performed to examine the existence of long run relationship among the variables.

Cointegration

After satisfying the stationarity condition, the next step is to find out the Johansen cointegration by using Johansen and Juselius test. To test the long run equilibrium relationship among the variables (GDP FDI, imports, exports, CO_2 and energy use) requires a second round of analysis with the help of Johansen cointegration test. The co-integration test is very significant; as it helps to determine if the variables under study

have the tendency to move together (converge) in the long run. If the residual or variables are stationery, there exists a co-integrating relationship among the variables. The model for cointegration and error correction is specified as:

$$\mathbf{DLfdi_t = \alpha_o + \alpha_1 DLGDP_t + \alpha_2 DLEx_t + \alpha_3 DLImp_t + \alpha_4 DLCO_{2t} + \alpha_5 DLEnuse_t + \alpha_6 dummy + \varepsilon_t \ (3)}$$

Here, L represents the log & D the first difference of the variables in question.

fdi = Foreign Direct Investment

GDP = Gross Domestic Product

Imp = Imports

Ex = Exports

CO_2 = Carbon Émissions

Euse = Energy Use

dummy = '1' for 1975-2010 and '0' otherwise

ε_t= Error Term

Table II.2 (Appendix II) shows the results of Johansen cointegration test and explain that there exist three co-integration equations at 5% level of significance with the p-values of 0.0582 for $r \leq 3$. While at none, $r \leq 4$ and $r \leq 5$ the null hypotheses was rejected at 5% level of significance. The rejection of null hypotheses means that the co-integration equation exists. The results obtained imply the existence of long run equilibrium relationship among variables in the model. The trace tests and maximum Eigen value reveals that there are not more than three cointegrating equations exists.

Cointegration test results highlight the existence of long run equilibrium which converges over time. Hence now VECM test can be performed.

Vector Error Correction Model (VECM)

Once the co-integration test is done VECM analysis is used as it is an appropriate technique to determine the short and long run relationship. The results from VECM are presented in Table II.3 (Appendix II). Error correction model estimation uses the residual from the cointegrating regressor and makes it an explanatory error correcting regressor to cover short and long run dynamics between the variables. For the VEC model first thing to do is to decide the lag structure and in this analysis, maximum

values of AIC statistics are used to select appropriate lag. For this purpose an equation is formulated for both short and long run effects as the series are co-integrated. The dynamic model is as follows:

$$\Delta Y_t = \bar{I}\Delta Y_{t-1} + \ldots + \bar{I}_{k-1}\Delta Y_{t-k+1} + \alpha(\beta Y_{t-1}) + u + \varepsilon_t \quad \text{--- (4)}$$

Here Y_t= Vector of endogenous variables like trade, FDI, CO_2, energy use, exports and imports

Δ = Difference operators

$\bar{I}$, $\bar{I}_{k-1}$ = Matrices of short and long run coefficient

βY_{t-1} = Measure of error (deviation) from the equilibrium

u = Vector of constant

ε_t = Error Term

The above equation shows both short run and long run effects and is obtained from cointegrating equations lagged residuals. The result indicates that in case of India the error correction terms are negative and significant (the foremost condition for VECM). This means that variables are converging together in long run equilibrium exists which is more specifically a strong speed of adjustment to equilibrium exists. Using the results from the cointegration, VECM test has been performed and the results obtained at 1% significance levels. The error correction term represented in the table shows the speed of adjustment among the variables. The result shows there is a positive relationship between GDP growth and energy use. This means in long run a 1% increase in GDP growth will lead to 0.3% increase in energy use. Similarly, a long run positive relationship exists between energy use and imports by 0.46%. Also imports are influencing energy consumption positively in long run by 0.63% at 1% level of significance. However in long run there is negative relationship between FDI and CO_2, FDI and GDP, FDI and energy use at 1% level of significance. All variables are statistically significant. This means that null hypothesis which states FDI has its positive impact on environment and energy use is neglected and accepted in case of GDP and energy use, energy use and imports and imports and energy use.

The variables GDP, energy use and imports will be at the equilibrium position in long run. In a nutshell production activities, GDP and imports in India are based on energy consumption at large extent. This kind of economic activities of production, consumption

and distribution implies great dependency on energy sources which can be to an extent deteriorating for the environment- directly or indirectly. Overall the short run and long run magnitude characterized by causation and the direction of causality among the variables is defined in upcoming section. The causality results will further help to summarize the direction of causality among these variables.

- ***Causality***

After determining the stationarity and existence of the short and long run relationship among the variables through Johnson cointegration and VECM, the Granger causality test can be applied. According to Danladi and Akomolafe (2013), "If a set of variables are cointegrated, the effects of a shock to one variable spread to the others, possibly with time lags, so as to preserve a long-run relationship between the variables". The Table II.4 (Appendix II) shows the results of Granger Causality Tests. The results show the existence of three causal relationships. Firstly a bi-directional causal relationship is found between India's imports and energy use with 0.05 and 0.02 probabilities. This shows that India is importing energy, consuming goods and services such as crude oil, electronics etc.; the manufacturing of which involves huge energy consumption (Oil, electricity, natural gases). The use of conventional sources of energy has declined and been replaced by renewable sources of energy such as natural gases, electricity etc. The situation works the other way around, where energy consumption gives rise to imports in India; which is again justified. Greater the energy used, larger the production thus resulting in rise of demand in forms of imports to India from trading countries.

A unidirectional causal relationship was found between GDP and energy use with a 0.04% value. Energy is critical to the economy on the supply as well as the demand side. On the supply side, energy is a key to production, labour and capital. While on the demand side, consumers maximize energy usage to improve its utility. Thus, energy plays a very important role in economic growth and the betterment of living standards (Emmanuel 2013: 4). In case of India it implies a causal relationship running from GDP to energy which concludes that India is energy dependent for growth. The argument was also supported by scholars Masih and Masih (1997) who believed that "if causality only

runs from GDP to energy consumption, this implies that an economy is energy dependent" (Masih and Masih 1997: 417-440). Thus, as observed by many others too, the government can implement energy conservation policies without worrying about any possible negative ramifications to employment and growth.

As against this no causal relationship was found between exports from India and CO_2 emissions. India is the largest producer of minerals, oils, pearls and precious gems, followed by pharmaceuticals, vehicles etc. and exports mainly to developed countries such as USA, UAE, Singapore, China, and Hong Kong etc. (EXIM 2015: 2). Similarly, no causal relationship was found between imports to India and CO_2 emission. India's biggest import partners are China, UAE, Saudi Arabia, USA, and Switzerland etc. with products such as crude petrol, gold and silver, electronics, pearls and gems etc. The main importing countries are developed and take care of environmental norms during production, consumptions and distribution of the goods and service (The Guardian: 22 February 2013). This clearly shows that India follows international standards that require low carbon emissions to attain high environmental standards in production and international trade. Furthermore, instead of using CO_2 emitting energy sources in long run, India is using other means of energy sources in production and consuming those sources of energy which are carbon free and that is the reason its exports and imports are compliant with international environment standards.

Similarly no causal relationship was established within the given time frame between FDI and economic growth (GDP), FDI and CO_2, FDI and energy use. This shows firstly, that the share of FDI in percentage of GDP is very little in case of India; it was recorded at just 1.7% in 2014, up from 1.31% in 2012, which grew from 0.02% in 1991 (World Bank 2014: 1-2). This little share of FDI in GDP became a crucial reason to avoid drawing any long run relationship between the two variables. Secondly, the reason of this little share is India being an agrarian economy initially. The highest share to GDP was contributed by agriculture, followed by industries and then services for a long time (Planning Commission 2015: 2). In India, maximum FDI inflows takes place in services (discussed in Chapter I) and thus no causality between FDI and CO_2 can be drawn. FDI in services is the highest (41% share) followed by manufacturing (telecommunications,

automobiles etc.) with 23% both of which are relatively low CO_2 emitting sectors and hence the long run causality is nil. The externalities caused by service sector have nominal adverse effects on environment. The environmental performance of FDI inflows in services brings more environment friendly goods and services, using energy efficient programs and educating consumers regarding the merits of products (especially in retail sectors product) (Rosenblum 2000: 4669). Secondly, the inflow of foreign institutional investment in recent years has grown at a faster rate as compared to FDI inflows, which are a non-CO_2 emitting sector. No causality is found between FDI and CO_2, this may be another contradictory empirical result as FDI is assumed generally environment deteriorating.

Similarly, no causal relationship was found between GDP and CO_2, GDP and exports and GDP and imports suggesting that a rise in economic activities in the country (India), cannot be a function of the rise of pollution (CO_2). The fact that GDP in India is increasing primarily in the non-polluting sectors is a proof point. In India the production of goods and services helps in increasing the GDP without going causal with carbon emission level. Similarly, the GDP has no causal relationship with trade (imports and exports). India's trade and economic reforms have produced positive results. Between 1990 and 2005 India's trade to GDP ratio has jumped to 35% of GDP from a mere 15% at the beginning (SAARC Trade Promotion Network 2015: 1). Being an agrarian economy, the role of agriculture and industrial sector is much stronger then external sectors. Though the economic reforms were adopted, there are still restrictions like anti-dumping measures that are used as ways to protect trade.

India has been one the few countries that withheld FDI in retail trade for the longest time. Although this policy has been partially relaxed recently, it still remains considerably restrictive (World Bank 2013: 2). Furthermore, no causality is found between FDI inflows and international trade (Exports and imports), FDI and energy use in India. The relationship between trade and investment is the result of globalization and liberalization policy of 1991. This has opened up the Indian economy for trade, yet the long relationship between FDI and trade does not exist. The result of causality clearly

shows that investment in India is not responsible for India's trade share in world and vice versa. The country is not dependent on foreign investments to increase its international trade performance in long run. This case is supported by the United Nations Conference on Trade and Development's (1996) definition which believes that conceptual models of FDI and international trade have traditionally been developed separately. The Heckscher Ohlin–Samuelson model suggests that "international trade can substitute for international movement of factors of production including FDI" supports the result. Thus it can be broadly concluded that in case of India both the variables (Trade and Investments) are growing independently. In case of FDI inflows and energy consumption, no causality is found which shows that FDI does not lead to energy consumption increase in long run. Sbia et al. (2014) found FDI reduces the energy use as there is a negative relationship between FDI and energy consumption. Similarly, Lee (2013), Omri and Kahouli (2014) and Dritsaki and Dritsaki (2014) found economic growth is not affected by FDI, energy and Carbon emission.

Furthermore no causality was found between the other two sets of variables such as imports and exports, export and energy use. The trade balance of a country depends on the level of exports and imports making them critical in the country's economy. If exports and imports are not going hand in hand, as was found in the results in Indian scenario, it can be said that there is trade deficit in international trade. This results in no long run causality between the two. Similar was the case of exports and energy use, it is a well-known fact that production process involves energy use and if the two are not moving in one direction in long run that shows that energy consumptions for exported product is a short term process. While in long run energy consumption is either minimized by the producers or other renewable sources of energy will be used rather than the conventional one which will take exports and energy use hand in hand (Chibueze 2013: 297).

CHAPTER III

FOREIGN DIRECT INVESTMENT AND ENVIRONMENT IN BANGLADESH

III.1 Background

FDI became a crucial economic tool for Bangladesh as it moved away from the foreign aid it had received after independence. The country had to learn to survive on its own without any economic crutches (aid). FDI was seen as a way to bridge the saving-investment gap, reduce poverty, balance trade, create jobs for its vast labour force, increase foreign exchange earnings and acquire new modern technology and management skills in the country (Rayhan 2009: 105). Bangladesh signed bilateral and investment guarantee agreements along with a promise to protect the patents, designs, trademarks and other rights of foreign investors as a means of encouraging investments. Bangladesh also provided customs and bonded warehouse assistance to exporters, free repatriation of profit, full convertibility of Taka, registration under BOI, and facility of no prior approval (Raihan 2008: 18). Such steps created profits, a competitive environment and improved the state of industries and socio-economic conditions of Bangladesh. These encouraging steps by Bangladesh created a welcoming environment of investment and had a positive effect on the economy. Hence, researchers or academicians cannot deny the benefits of FDI, as it has provided Bangladesh with a platform to flourish its external sector.

At the same time, spillovers of these investments in Bangladesh such as low wages (compared to laborers of developed countries), poor working conditions and unbridled exploitation of the domestic resources cannot be neglected (Ghosh 2014: 2). The most important adverse implications of FDI inflows noticed are the environmental problems, which further impact health and society. In 2007, a report published by Climate Change Cell Department of Environment stated that Bangladesh should deeply analyze the threats and opportunities (social and environmental) for foreign investment because it is prone to natural disasters and climate change impacts. With the increasing populations of the country, the demands for resources such as technology, employments etc. are increasing, which give rise to massive industrialization, health issues and to

environmental degradation. Only a few studies have been conducted that focus on the risks associated with foreign investment to a country's society and environment.

This chapter of the thesis is an attempt to analyze the relationship between FDI and environment and will study the real effects of FDI on the environment in Bangladesh, similar to the analysis conducted for India in the previous chapter. This will help draw out conclusions on the real effect of FDI on the environment since the adoption of liberalization policy in Bangladesh.

III.2 Foreign Direct Investment and its Positive Effects

FDI is known to be a powerful indicator of development in today's liberalized world; and neither the developed nor the developing country can ignore its importance. Considerable research has been done to examine the advantages of FDI in host countries.

Shah (2014: 8-10) stated that in a liberalized world, economic supremacy is the foremost feature. In order to survive, FDI is considered to be a powerful instrument of development through which the developing economies such as Bangladesh can achieve their socio-economic development goals like poverty reduction, employment, GDP growth and sustainable environment. For achieving these goals, optimum use of local resources will help in reducing the cost of goods and services, which will increase the consumption capacity of the local people with their existing low incomes. Apart from these two benefits, FDI also helps increase international exports and foreign currency earnings (Billah 2012: 80). A study by Azam (2010) used a simple log linear regression technique for time period 1980-2009 to prove that exports and FDI are the two key indictors impacting economic growth in South Asia. The results he obtained show that exports and investments are the engine of economic growth and FDI is significant in case of Bangladesh and Pakistan at 1% level of significance; while, in case of India it was insignificant. That means exports and investments are proved as growth engines for Bangladesh over the years and not in case of India.

Furthermore, a study by Rehman et al. (2009) found a different result by using different statistical tests. The inference of the results was that the significant effects of FDI can be obtained by using determinants such as market size of the economy, trade

openness, labour quality and accessibility to international market. This study was conducted for the period of 1975 to 2008 on Pakistan. The results obtained between FDI and GDP growth is significantly positive which means FDI inflows is a key factor of GDP growth in Pakistan. Mottaleb (2007: 2-4) in his study used a panel data analysis of 60 low income and middle low income countries to see the effects of FDI on economic growth. He found that FDI in third world countries is an important means of economic growth, and can be obtained from developed countries. Hence there is a need to import modern technology, managerial skills and improvise saving investment gap through FDI inflows. In another study by Kabir (2007), various macroeconomic level benefits of FDI were described. He tried to explain the potential of FDI inflows in expanding the growth and production of Bangladesh's economy. In his results he found FDI inflows facilitate growth through foreign sources in the form of capital which is unavailable domestically in the host country. FDI facilitates economic sectors such as, manufacturing, energy and infrastructure which further lead to rise in the rate of employment, GDP, poverty reduction and per capita income. Additionally, FDI gives cost advantages to Bangladesh in the form of better technology transfer and positive externalities by these developed countries technologies.

Similarly, Ahmed (2006) worked on FDI in Bangladesh FDI and sectoral growth; and according to his study the primary goal of investment should be to set guidelines for investment and reach a sustainable economic growth by labour intensive based economic activities. After that the next focus should be on the strengthening comparative advantages of the country (this will strengthen the domestic capital market), technology advancement and its diffusions. Leaving few years in which FDI recorded negative FDI inflows, overall FDI has helped the Bangladesh economy to attain growth mainly in industrial and service sector. He further suggested weighing positives and negatives of any FDI proposal is must before they enter the country as it will help to reduce the dependency of foreign investors on borrowing from foreign banks and raise more and more capital from the equity domestic market (Ahamad and Fahian, 2010:5-6). In the same year Quattara using Autoregressive Distributed Lag (ARDL) test analyzed the short and long run production function in Mauritius (Shimul et al., 2009: 70). The result of co integration test showed the significant impact of FDI on economic growth in Mauritius.

Sahoo in year 2006 worked on "Foreign Direct Investment in South Asia: Policy, Trends, Impact and Determinants". He stated that FDI in South Asia in the 1990s has gone through many changes and in recent years these changes have fastened even more. These constant positive changes in FDI policy have liberalized the approach towards foreign investment and increased it with positive effects in South Asia. He suggested that there is need to improve domestic investment, trade performance and infrastructure level to attain more significant FDI level. A study by Mian and Alam (2006: 1-9) on the scenario of FDI in Bangladesh, mentioned that FDI as a main determinant of Bangladesh's economic growth and development. The reasons that negatively affect FDI inflows in Bangladesh are corruption, political instability and ineffectiveness of government in controlling bureaucracy, weak physical and policy infrastructure.

UNCTAD (2002a) and OECD (2002) mentioned in their report that FDI contributes to the developing countries like Bangladesh in various ways such as trade integration, open and competitive business environment and enterprise development. All these combined, lead to poverty reduction and high economic growth. According to Azim and Uddin (2001: 290-93), in their paper on "Environment of Foreign Direct Investment in Bangladesh: An Empirical Assessment", wrote that a positive attitude and environment in the host country is very important to attract FDI. In Bangladesh, their study revealed that the positive factors for investors are economic factors such as tax benefits, preferential trade agreements with neighboring states, low managerial costs, unskilled labours and labour productivity. The factors that discourage foreign investors in Bangladesh are political uncertainty and bureaucracy, corruption and weak law and order situations. For increased FDI connecting seaports for investments, with backward and forward linkages to the foreign projects are essential.

Agrawal (2000: 1-5) analyzed the economic impact of FDI in South Asia (India, Pakistan, Bangladesh, Sri Lanka and Nepal) using various econometric techniques such as panel data, time series and cross-section analysis. The result shows that there are complimentarily linkages between foreign and domestic investment. Mallampally and Sauvant (1999: 2-6) in their study stated that FDI brings productive assets, foreign capital for long run, technology, entrepreneurial and managerial skills, innovations, skills,

organizational behaviors and marketing and export techniques to host country. Bangladesh Institute of Development Studies (BIDS) conducted a survey in 1997 demonstrating that 96% female workers are employed in garment industry. The women participation in this sector gives recognition, status in the family, income, better quality of life to family and direct access to cash income, empowerment and provides them with considerable freedom. They contribute a greater share in the household as they are earning members of the family.

There are few studies that found the mixed results of FDI on host countries; for instance Chowdhury et al. (2010: 54-55) in his research on FDI and its impact on society in Bangladesh stated that FDI since 1980s started playing key role in growth and development. During the development process in Bangladesh, many MNCs entered into the territory of the country and helped in the development process. This results in social and economic development on the one end in the form of revenue generation, GDP growth, infrastructure development and employment and helped the people and society. While on the other end, it impacted the society negatively through child labour, poor working conditions for labours, low wages, dumping of residuals, health issues and environmental deterioration. Mian and Alam (2006: 1-9), worked on "Foreign Direct Investment and Development: The Bangladesh scenario". They used empirical studies, for showing that FDI in Bangladesh is important, as it contributes to growth and development. The results of the analysis shows that trade and investment can be facilitated with the help of an investment environment. Thus an environment that provides facilitation and strong domestic policy in the long run will help Bangladesh. This is yet to be achieved, as the Government of Bangladesh is unable to control corruption, create political stability and develop infrastructure, political stability, law and order and infrastructure creation. These factors impede the investment in Bangladesh.

III.3 Foreign Direct Investment and its Negative/Mixed Effects

On the one side, researches and studies have found that FDI is crucial in growth and industrialization of developing countries such as Bangladesh; while on the other many findings and researches have come up with multiple negative effects of FDI on society,

health, economy and environment. A comprehensive analysis of such negative effects follows:

Bangladesh Planning Commission (2013: 78-87), its millennium development goals (MDG) titled "Ensure Environmental Sustainability" stated that Bangladesh is not as big a CO_2 emitter as developed countries and due to its low developed Country status it has no obligation to reduce the emission of greenhouse gases. Still the carbon emission increases every year with a substantial increase from 0.26 tons per capita in 2001 to 0.38 tons in 2015, derived majorly by the power sector, transportation and industrial production. To deal with the challenges of MDG, government effort have been inadequate due to lack of donor support for environmental issues, no priority to individual environmental programs and reduced focus on climate change. In his research, Khan (2013: 156-161) in the paper titled "Lawachara Forest, Nishorgo Support Project, and Seismic Survey of Chevron: Actors and Response" stated that Chevron seismic survey in Lawachara was encouraged by the management and co management bodies such as Ministry of Environment and Forests (MoEF), International Union for Conservation of Nature (IUCN), International Resource Group (IRG) and government because of their individual leaders interest in making money. IRG and IUCN are in a business relationship and receives funds from Chevron while on the other side Bangladesh Environmental Lawyers Association (BELA) and Wildlife Trust of Bangladesh (WTB) which are responsible as the official consultants of wildlife Act (1974) for the flora and fauna biodiversity conservation have proven to be weak and passive actors incapable of preventing Chevron from working in the park.

Therefore, the support of these actors makes such projects very dangerous by creating suspicion between the state and local communities. He further added that it also puts the image of environmental organizations that are involved under dire crisis either at national level or at global level. In the same year, Islam (2013: 30) used Life Cycle Assessment (LCA)[17] and Gabi 6 educational version software to discover that a large amount of water is consumed in readymade garment industry in Bangladesh. Cotton production, cotton

[17] LCA is a technique of assessing the environmental aspects of production, processing of the products and services. This inventory is a compilation of material inputs, energy and release in environment. LCA also evaluates the potential impact on environment due to inputs use and output release.

processing and washing involves large amount of water consumption at every stage. The global warming potential measure shows that CO_2 emits at various cotton cardigan LCA stage. The highest amount is emitted at cotton processing stage, which attracts the second highest foreign investment in Bangladesh. The production capacity of garment industry in the production of cardigan is 100,000 to 150,000 pieces per month. The production is based on the supply hence the effect of proportional consequence applies accordingly.

Similarly, pointing towards the negative impact of the textile industry, Islam et al. (2011: 432-38) stated that 11% of the world's total pesticides are consumed by cotton industry as it consumes maximum amount of water and pesticides. Use of pesticides at these levels creates environmental degradation and health hazards. They also found in their research that, the textile industry is negatively affecting the local environment in Bangladesh due to emission of hazardous effluents used in textile dye. The effluents used contain toxic chemical and organic pollutants and the use of such effluents is beyond the accepted standards. These toxic dyeing industries are located in Gazipur and Narayanganj area of Bangladesh, which discharges copious amounts of toxic waste, chemical pollutants to Turag and Shitalakkhya River. The level of discharge in these areas has crossed the standard level defined by the environment department. The toxic discharge to water risks the aquatic life, diseases, and epidemics to the people living around the river belt.

Majority of the villages nearby that area (like Gazipur) are already showing degradation. Only few polluted industries have treatment plant for waste water. While exploring the impact of FDI on society, Khan (2011: 44-48) stated in his study that the textile sector in Bangladesh engages large number of children. As per ILO convention (International Labour Organization) child labour is not allowed in export oriented manufacturing and mining industries. Still in Bangladesh, child labour exists in textile, dye and other hazardous sectors in which foreign investment is inflowing. In 1995, ILO and United Nations Children's Fund (UNICEF) signed a project, to remove child labour from 2,500 industries of Bangladesh.

Criticizing the long term role of FDI, an article by Ishtiaque (2010) titled “Is Foreign Capital a Viable Option for Development in Developing Economies?” suggests that foreign investment has adverse effects on the developing countries because it crowds out domestic investment and turns it into consumption. Such increments boost short term growth and damages long term growth of the economy. Also foreign capital inflows overvalue the local currency by creating detrimental effects on export sector. Due to poor governance in developing nations and flow of capital from poor countries to rich countries, the absorption capacity of foreign capital is also poor. In contrast, domestic capital plays an important role in the development process of less developed and developing countries. Evidence proves that countries, which financed their development from domestic sources, are growing faster.

Gain conducted extensive research on multinational companies (MNCs) and its impact on environment; in his article in 2009- “Seismic Survey Signals Trouble in Lawachara Forest”, Gain states that Chevron survey has not only disturbed the Khasi Punjis tribe residing inside the park but violated Bangladesh Wildlife Preservation (Amendment) Act, 1974 Section 23(3). The act states that disturbing wildlife through any sound or gun firing interferes their breeding process and clearing the cultivating land for mining process is prohibited. As per Gain, Chevron has clearly violated the act as the explosion was in the middle of breeding season and disturbed the animals and birds. The government, which gave permission to carry out the survey by relaxing the section 23(3) of the act in public interest under gazette in the order of the president, is also accused of being guilty of this violation.

Though the Chevron Corporation nullified this accusation; stating the explosion took place under ground and that too for a second. Gain (2008” 4-5) in another article “Lawachhara National Park and Its Misfortune in 2005” stated that the park which was well known for its habitats, endangered hoolock Gibbons, colorful birds and plant species was disturbed after Unocal and later Chevron entered the heart of the park by installing gas pipelines. This action has violated the Bangladesh Wildlife Preservation Act of 1973, Environmental Conservation Act, 1995 and Environment Conservation Rules, 1997. According to these laws hunting, performing commercial activities and killing or

capturing of wildlife are strictly prohibited. Unocal and Chevron, ignoring the laws and their own promise to maintain the forest, continued their activities.

Furthermore Azizul and Islam (2011: 229-248) in their study examined the operation and influence of one of the biggest foreign company in Bangladesh: Niko[18]. Niko a foreign operator in Bangladesh was involved in the blowout in Tangrtila gas field in 2005. They found in their research that Niko is creating massive environmental and social damage via oil spills, gas explosions and chemical leaks in the field. The news media came out in support of the company rather than backing the people protesting against Niko. They claimed that by doing so the media showed itself to be working for personal benefits rather than the public good. Calvano (2008:793-805) on Niko's environmental incidence in Bangladesh found that when such conflicts emerges between MNCs and the local people, government is accountable to interfere as a third party and create pressure.

Kabir (2007: 105-107) in his study titled "Is Foreign Direct Investment Growth-Enhancing in Bangladesh?" used co integration and causality techniques and found FDI has no causal relationship with GDP growth in Bangladesh. This means that FDI inflows are not influencing the domestic output growth. The reason of the small magnitude is the limited share of oil and gas sector, chemical and agro-based industry in GDP, while attracting the maximum investment from IOCs (International Oil Companies). Another reason may be the full entitlement of repatriation of profit and dividends. Hence to attract more investments, FDI policy reforms are required with high return rates for host sectors, competition policies among host and foreign investors, tax holidays and improvement of governance in Bangladesh. Szymczyk et al. (2007: 8-15) found in his research that in Bangladesh the dyeing process uses compound such as Amine, carboxylic and azo which are dark and harmful to the environment.

In a study by Nasreen et al. (2006: 73), it was found that the damage caused by Niko in Bangladesh caused deterioration to environment, human health and damaged the socio-economic fabric of the surrounding locations. Explaining the negative impact of FDI on

[18] A Canadian-based multinational company called Niko focuses on oil and gas exploration.

Bangladesh economy, Azim (2000: 116-139) in his article "Foreign Direct Investment in Bangladesh: Trend and Pattern", stated that for foreign investment there is an unsatisfactory environment in Bangladesh because of frequent changes in government, low saving rates, high unemployment rate, dominant role of pressure groups, dearth of foreign exchange and technological and managerial skills. The country managed to attract only 1, 46082 Million Tk. foreign capital in 1997 because of this unsatisfactory investment environment. However, the trend began to change after liberalization as foreign investors preferred to avoid the adverse investment environment of the country by joint ventures with local entrepreneur to reduce risk. This helps in attracting fresh technology and capital in the form of investment.

A report by Society for Environment and Human Development (1998: 196-210)) published shows that environment is the least priority of the Bangladesh economy. They claimed this because Bangladesh doesn't regulate pollution strictly and also does not invest in industrial waste treatment. Engineering Planning Consulting Team (EPCT) in 1997 on a report on Maghurchara gas explosion reported that the fire of 1997 damaged and displaced wildlife, property, people land area, natural forests of 60 hectares, 300 hectares of land were burnt and around 3000 people were affected as around 31 hectare tea gardens were burnt. Similarly, the Department of Environment, Bangladesh (1990) performed a survey of tanneries, industries and found that the residents and people working around these tanneries and industries faces serious respiratory problems due to the acidic emissions from the various effluents.

The literature reviews above clearly shows the dichotomy in the impact of foreign investment on the host countries such as Bangladesh. Foreign investment over the years has played both – a positive and a negative role in the economy, society, health and environment of the host country. On the bright side, FDI has helped a developing economy like Bangladesh by providing it an opportunity to flourish, develop its society and environment through socio-economic incentives like labour rights, strong trade union, transparent trade system, decent wage rates and welfare plans for workers like provident fund, housing and considerate working hours etc. (Mahmud 2013: 33). Thus an

empirical study will shed more light on the impact of FDI on Bangladesh; the study will help analyze the real cause and effects of FDI in Bangladesh.

III.4 FDI and the Environment: Empirical Evidences from Bangladesh

This section of the chapter deals with the time series observations of six variables chosen for Bangladesh. The six variables selected- GDP, FDI inflows, CO_2 emission, Energy use, Exports and Imports, are chosen as a proxy of different economic indicators. For instance GDP is a proxy of economic growth, exports and imports are proxy of international trade, FDI is used as a proxy of investment, CO_2 and energy use are the proxy of environment.

GDP is chosen as a proxy of economic growth because it takes place when an economic activity in the form of transaction of consumer and government goods and services increases in the economy. Similarly, exports and imports are good indicators of trade because the exchange of goods and services is bidirectional. CO_2 and energy use are selected as indicators of environment quality. CO_2 is an important indicator of air pollution, global warming and environment pollution. It causes adverse effects on environment, health, and society through global warming. Energy consumption is the other indicator used for environment quality because the sources of energy such as fossil fuels (Coal, Natural Gases and Oil), and nuclear energy impact the environment to large degree as they are consumed. Burning of fossil fuels generates emissions, and nuclear waste pollutes the environment with radiation. The conventional sources of energy which are used in this analysis are the best indicator of assessing environment quality as their usage harms the environment more compared to the non-conventional sources of energy such as solar, wind, geothermal and water energy.

Lastly FDI is used as an indicator of foreign investment. The data for various indicators are kept the same and collected from Bangladesh Bank, Ministry of Commerce and Industry, Dhaka and World Bank development indicators. The time frame chosen for the analysis is 1975-2010. The reasons of choosing this time frame are based firstly on the curiosity to see the long run relationship over a considerate time period. This time

period also helps analyze the relationship among the variables before and after economic reforms.

The analysis involves various steps but before going into any rigorous econometric exercises, the variables are presented in time series forms and analyses of data are explained. Analysis of data begins with studying the growth pattern of each variable individually over the years, which helps asses assess the changing levels of these variables and the role played by them in the Bangladesh economy (In section III.4(i)). Then the stationarity of the variables at different levels of significance will be checked. Augmented Dickey Fuller tests are used to check the stationarity of the variables and whether the unit root is present in an autoregressive model or not. For further analysis, all the variables should be stationary at similar levels otherwise it becomes difficult to carry out any meaningful econometric exercise. Once all the variables are stationary, Johansen cointegration is used to establish long run relationship among the variables. Johansen cointegration is a procedure of testing co integration of time series.

The test of cointegration does not tell the magnitude and direction of relationship among the variables hence the Granger causality and error correction model (ECM) will be used. The Granger causality approach was proposed by Granger (1969: 429-30) which is a time series data based approach to determine the directions of the relationship among the variables. This test helps in forecasting. The different directions for these purposes are Unidirectional, Bidirectional and lack of causality. Last but not the least; an error correction model will be applied as it tells the exact magnitude of long run and short run relationship among the variables. On the basis of the results obtained a concrete analysis is discussed to see the real cause and effect relationship among the variables.

III. 4 (i) Backgrounds and Trends in Bangladesh[19]

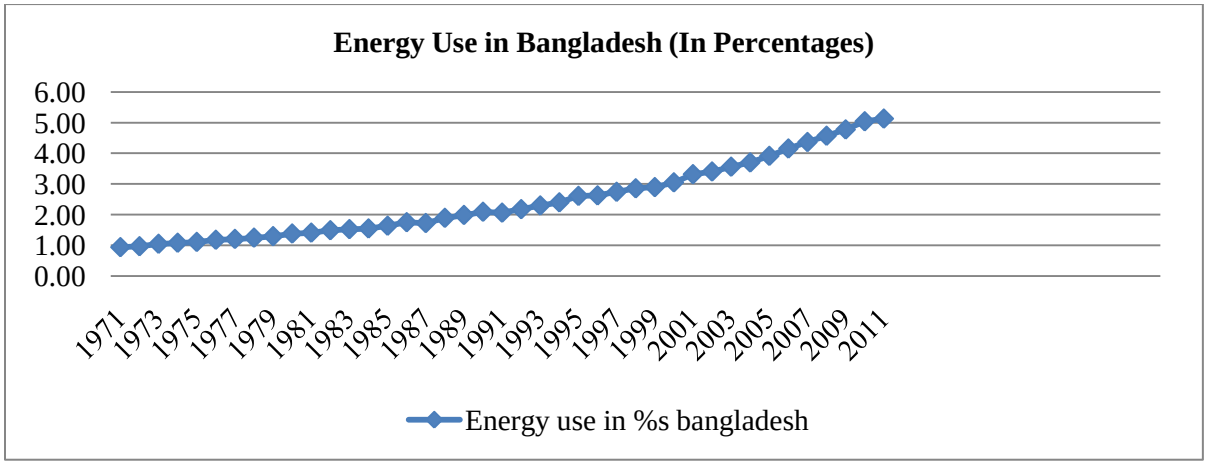
The variables chosen for analysis are energy consumption, CO_2 emissions, exports, imports, GDP and FDI inflows. This section will analyze the trends of each variable in Bangladesh, starting with energy, which is an important source of livelihood

[19] All Values of Exports, Imports and FDI are in Million US$.

and a key ingredient in improving the socio economic conditions of a populous economy like Bangladesh.

In Bangladesh the important sources of energy are natural gas, oil, coal, hydropower, solar and wind. Imported oil and coal are the main two alternative sources of energy production in Bangladesh. The main state owned agencies that provide energy in Bangladesh are BAPEX (Bangladesh Petroleum Exploration and Production Company) and Petrobangla, and suffer from large deficit to generate adequate electricity. It has been found that in public sector many energy generating units are old and of low reliability and productivity. With the increasing demand, the government is not able to supply the energy (Ishtiaaque 2010: 395). Therefore, the government, Petrobangla and BAPEX depend on foreign companies to invest in Bangladesh gas and oil sector to fulfill the energy demand. According to Bangladesh Power Development Board (BPDB), in 2011 only 49% of the population has access to electricity while the demand is much higher. This scarcity of energy from last two decades has accelerated the demand for investment in energy (Mujeri 2014: 10). The government is taking various measures in recent years for the development of renewable and nonrenewable sources of energy. The renewable energy sources reduce the energy import, and divert country from conventional source of energy to environment friendly source of energy. To know more about the energy sector in Bangladesh it is important to analyze the trend of energy sector since its independence (Ahuja & Tatsutani 2009: 18).

Figure III.1: Energy Use in Bangladesh (1971-2011)

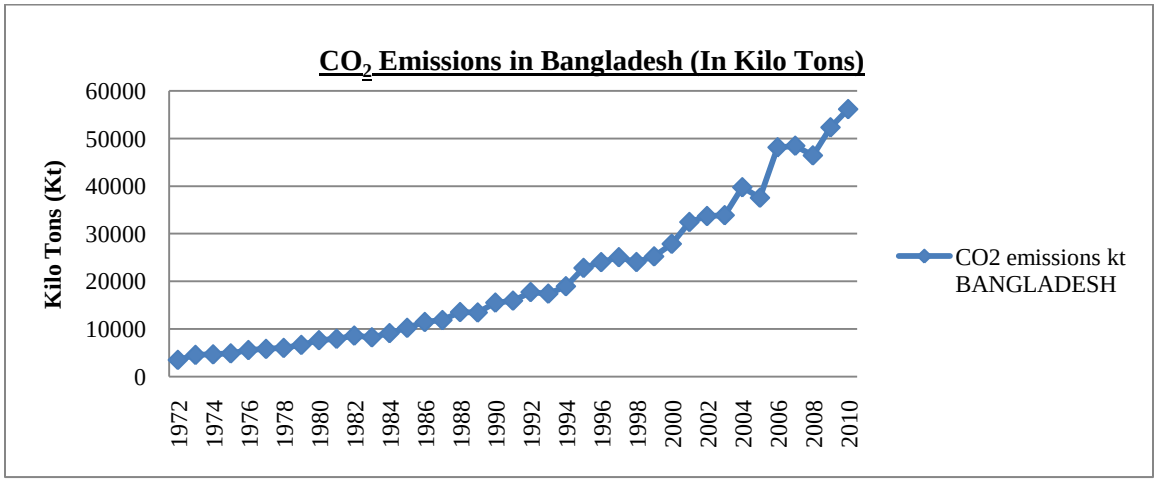


Source: Researcher's Computation based on World Bank Database.

Figure III.1 clearly shows the rising trend of energy use throughout with the energy use of only 0.93% in 1971. This was the year of independence for Bangladesh. Since then BERC (Bangladesh Energy Regulatory Commission) and related agencies have formulated a price policy for power and energy sector (USAID 2013: 1-4). Ever since then the energy consumption has increased. In further years, energy consumption increased from 1.38% (1980) to almost double that in 1990 to reach 2.09% of the total. In 1990s the energy use doubled again to and reached to 3.05% of total in 2000. The reason of increasing commercial energy consumption was the rising population and its demand for energy, industrialization, commercialization, economic growth and greater production of goods and services (Pesaran et al. 1998: 16). In 2005, energy consumption grew to 3.91%. Year 2006-07 recorded a demand of 3,970MW (Mega Watt) that increased even more with increasing population and its demand in year 2010 was recorded at 5.04% of total consumption.

Energy consumption is higher in urban areas (90%) and only 42% in rural areas. Urban areas are densely populated and excessively demand energy resulting in an energy deficit. Since the supply does not meet the demand of energy consumption, the government schedules load shedding as much as possible (Dhaka Electric Supply Company Limited 2006: 1). According to Ministry of Finance (2013) in their publication "Power & Energy Sector Roadmap: Trend of Progress", it was stated that the demand for energy rose by 8.1% annual rate in last over the last 10 years. The trends derived from the figure below clearly shows that the demand for energy is much higher than its supply. Natural gas and the coal resources of the country are still underutilized because of lack of proper guidelines (Slam 2011: 2). With a view to combat this, the government took initiatives to set up power plants so that the country has sufficient electricity by 2016. It rewarded foreign investors with incentives such as tax holidays to suppliers of technology and priority wise accessibility of land, loans and other resource facilities (Ministry of Foreign Affairs of Denmark 2013: 12).

Figure III.2: CO_2 Emissions in Bangladesh (1972-2010)

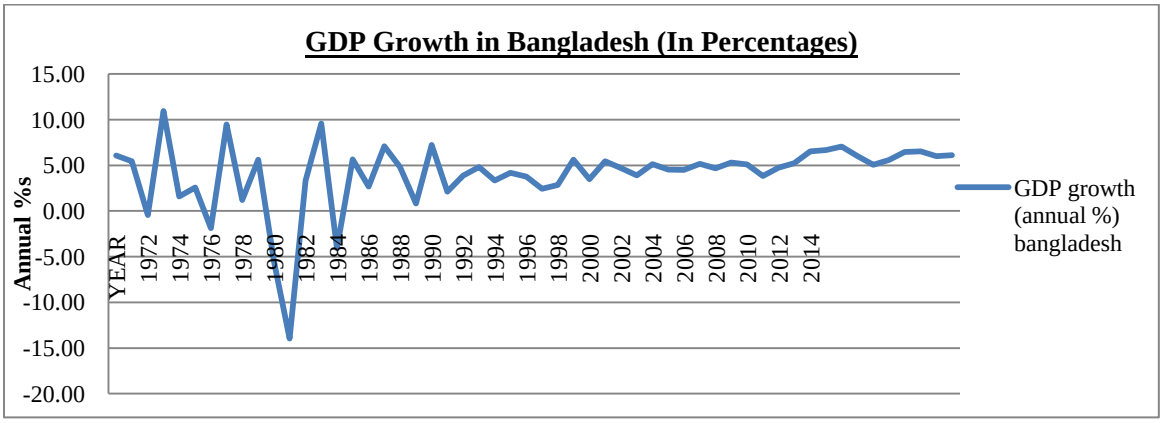


Source: Researcher's Computation based on World Bank Database.

Figure III.2 shows the trends of carbon emissions from combustion of fossil fuel such as coal, petroleum, lubricants and gases from 1972-2010. The trend line clearly shows upward increasing trends from 1972 till 2010. CO_2 is one of the major greenhouse gases that contribute to global warming and further to climate change. The total CO_2 emission was 5812.20 Kt in 1977, which rose to 22816.07 Kt in 1995. Petroleum followed by natural gas are the biggest emitters of CO_2.

Carbon emission in Bangladesh is increasing rapidly due to a growing population and greater energy consumption. Industries directly emit CO_2 through combustion of fossil fuels, while the service sectors indirectly emits by using electricity, air conditioners and transportations (Alam 2014: 40). The consumption further rose to 27869.20 Kt in 2000. In 2006 it was recorded at 48136.71 Kt, which is double that of the recorded weight in 2000. In a study on Bangladesh's energy consumption for the period 1977 to 1995, Azad et al. (2006:86-88) found that the rate of fossil fuel consumption in Bangladesh is more than 5% during the observation period, which causes CO_2 emission. In 2009, a caretaker government came in power and made drastic changes in action policy to reduce energy crisis which caused negative results: CO_2 emissions rose to 56152.77 Kt (2010) and electricity demand grew between 8-10% per year (Gunter, 2010:6). The maximum value was recorded in 2010 and minimum in 1972. The CO_2 emissions increased due to massive expansion of industries and services.

Figure III.3: GDP Growth in Bangladesh (1971-2014)



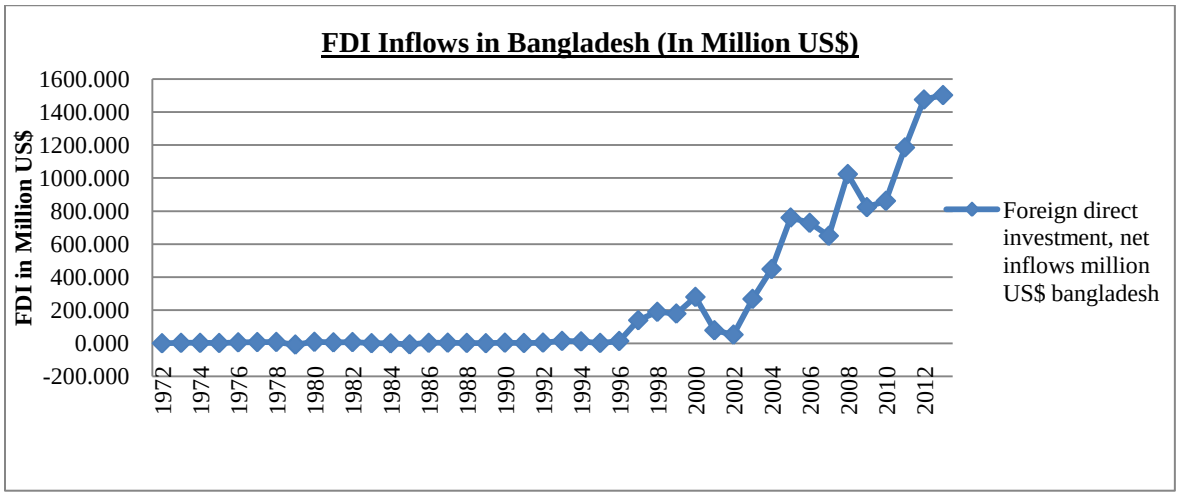
Source: Researcher's Computation based on World Bank Database.

Figure III.3 shows percentage growth of GDP in Bangladesh from 1971 till 2014. The trend shows very frequent ups and downs. In 1971, the year Bangladesh gained independence; GDP was recorded at -5.48%. Even though the country followed a socialist approach, it had a dearth of experienced workers and managers, administrators; and thus continued its slow GDP growth in 1975 (-4.09%). According to Lawrence (1988) Bangladesh changed its outlook after 1975, and adopted a new industrial model of economic development, capacity building and reshaped the economy according to today's modern globalised approach. The previous approach was based on nationalization, which was static and resulted in stagnation, inefficiency and fluctuating GDP growth (2.67% in 1977). In 1980, GDP growth was recorded 0.82% and after four years in 1984 it grew to 4.80%, a definite sign of progress. This was due to the encouragement given to private enterprise and investment, privatizing of public enterprises such as banking, telecommunication, aviation, media, and jute, trade patterns were liberalized and reinstating budgetary discipline (US Department of State 2009: 8).

During 1991-93, Bangladesh launched a program with the assistance of International Monetary Fund and created an enhanced structural adjustment facility (ESAF). The initiative failed due to unstable domestic political structure and recorded a GDP growth of 5.12% in 1995. The rigid government policies and reforms resulted in a loss of early gains due to the drop of FDI in late 1990s and hence resulted in a growth of only 4.67% in 1999. From 2000 onwards, the government adopted various policies to

support economic reforms such as Poverty Reduction and Growth Facility (PRGF) and free loans facility by World Bank. Like IMF and World Bank, the Indian government also extended a $1 billion line of credit to counter balance China's increasing interest and relationship with Bangladesh. This resulted in a growth of 5.57% in 2010 and 6.12% in 2014 (Karim 2012: 17). In 2014; Bangladesh Power Development Board reported that the rate of GDP growth in Bangladesh is 6%, which is a sign of a rapidly developing country (Sakib et al. 2012: 274).

Figure III.4: FDI Inflows in Bangladesh (1971-2013)



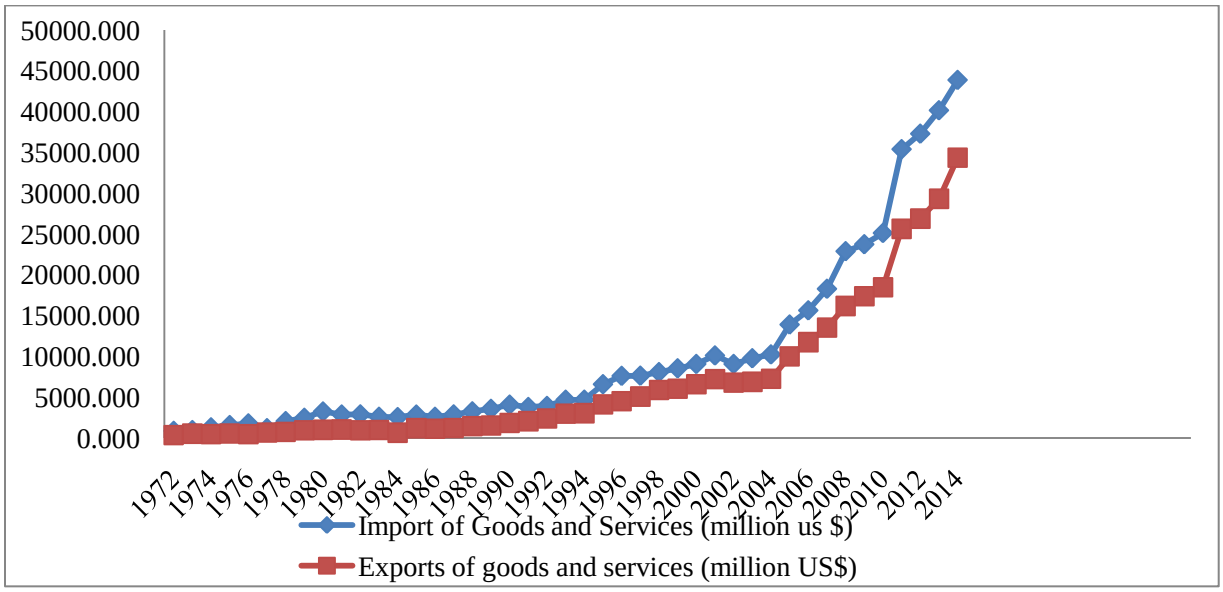
Source: Researcher's Computation based on World Bank Database.

Figure III.4 shows the total inflows of FDI from various countries of the world to Bangladesh. The curve shows the initial stagnant growth until 1996 after which the FDI growth began to rise but with fluctuating trends. At the time of independence in 1971, the share of FDI was very small due to restricted investment policies. It was recorded at only $2.3 million in 1973. In order to accelerate foreign investment, the government started taking several steps. BoI was set up in 1989 with the goal to attract and facilitate foreign investment (Mondal 2003: 105-110). In 1980, a FDI inflow was recorded at only $8.51 million, which rose to $14.05 million in 1993 due to the government's liberal policy on capital, profit repatriation and industrial sectors.

The growth of FDI started in 1980s and continued in 1990s. In 1999 there is a sudden decline in the trend to $179.66 million and the fall continues in 2001 and 2002

with the inflows of $78.52 million and $52.33 million. The year 2000 saw a rising in FDI inflows of $280.38 million. The reasons of failure to attract foreign investment were government's entrenched economic policies, political instability, shortage of power, gas and other utilities supplies, absence of effective intellectual property right imposition (Board of Investment Report 2014: 1-7). 2003 onwards, FDI inflows increased and rose to $1023 million in 2008; driven mainly by speedy implementation of new industrial projects by BoI in Bangladesh such as infrastructure facilities to foreign investors, trade facilities, dispute settlements and counseling before investment (Joynal: 27 May, 2014). According to Bangladesh Bank report, a declining inflow in 2010 was recorded ($861.32 million) due to economic crisis in America, which resulted in withdrawal of investments by many foreign investors from Bangladesh. FDI inflow then picked up again; and in 2013 it was recorded at $1,500 million. Chapter I of the thesis has discussed in detail the trends and compositions of FDI in Bangladesh.

Figure III.5: International Trade in Bangladesh (1972-2014)



Source: Researcher's Computation based on World Bank Database.

Figure III.5 shows the international trade (exports and imports) of Bangladesh from 1972 to 2014; the graph shows the increasing trends of imports and exports since

independence along with the dominance of imports over exports in international trade. The figure clearly shows that Bangladesh has been a trade deficit country since its independence. The situation has improved due to economic reforms and liberalization. Bangladesh trade policy can be divided into three phases: first phase (1972-1975) was about heavy control on exports and imports along with pervasive price control. Second phase (1976-1990) was marked by a move to trade friendly measures such as denationalization, tariff adjustments, market based economy, partial eliminations of quantitative restrictions etc. Third phase (1990- to date) is the most progressive phase based on liberalization, scaling down the tariffs, removal of trade related quantitative tariffs and floating exchange rates regimes etc. (Basher 2013:5).

From observing the trends of export since 1972, it is found that exports worth $364.84 million took place in 1972. It is clear from the figure that the trends of export recorded a small amount at $356 million in 1972, which grew to $1041 million in 1981 and 10 years later it was recorded at $2062 million. Overall exports from Bangladesh are recorded low due to lack of raw materials, infrastructure, skills, expertise, and unstable political set up. Year 2001 onwards, export earning began to raise because of the readymade garments industries. Exports value reached to 5 digits to $11744 million (2006) and further to $29304 million in 2013. It is also concluded that the growth of Bangladesh in apparel export overtook India in 2009 with the $2.66 billion exports, higher than $2.27 billion$ of India (Rahman 2013: 127).

On the imports end, Bangladesh mainly imports petroleum, food items, raw cotton, yarn, Iron and steel, edible oil etc. (Bangladesh Bank 2015: 1). In the beginning of 1972, imports were at $863.53 million, which grew to $2883 million in 1982. In ten years, imports rose as per the demands and growing population and in 1991 it were recorded $3785 million Imports further rose to $9.06 billion in 2000 as the country began to open its economy for foreign products. In 2005, the graph shows the rise of import to $13891.43 million mainly due to lower imports of food grains. Imports decreased from 2010 to 2011. For fiscal year 2011-12, the reasons were imports of capital goods and raw material for industries (Onneshan Unnayan 2013: 9). In 2013, imports grew more than thrice and reached $40135 million. To accelerate exports, Bangladesh government used

various financial incentives to exportable and technological commodities in the form of tax reductions and changed the composition of exports. Focus has diverted from importing more to increasing the exports earnings of the country (Ahmed 2013: 28).

III. 4(ii) Results and Discussions of Empirical Analysis: Bangladesh

- ***Modeling of FDI-Environment Nexus***

To examine the dynamic and complex relationship between international trades, FDI, GDP, CO_2, energy use in Bangladesh, a policy model based on FDI-environment was developed by Xing and Kolstad in 2002. According to the model FDI in the host country in the simplest way can be specified as:

$$\mathbf{FDI} = f_1(\mathbf{Exports, Imports, GDP, } Z_1, R^*) \quad \text{----- (1)}$$

Here, exports and imports are indicators of international trade, GDP is gross domestic product which is an economic growth proxy; Z_1 is a vector of exogenous variables affecting FDI inflows. These exogenous variables can be defined as cost structure, labor costs, environment, and rewards of factor services differentials. R^* is the indication of lax environmental regulations. The relationship between FDI and R^* which is expected to be positive indicates lax environmental policy which attracts more to pollution-intensive foreign investments, thereby in the host economy increasing polluting industries.

Similarly, the environment indicators (E) such as CO_2 and energy use can be specified as:

$$E = f_2(\mathbf{FDI, Exports, Imports, GDP, } Z_2, R^*) \quad \text{----- (2)}$$

Here Z_2 is a vector of exogenous variables such as prices, water pollution, land use, energy consumption, fossil fuel use that are affecting pollution levels in environment. The relationship between environment and other indicators (FDI, Exports, Imports and GDP) is expected to be positive which indicates that increase in the economic activities through trade; economic growth, investments and income growth proportionally increase the environment use. Also the relationship between E and R^* is expected to be positive which implies that lenient environmental regulations leads to increase in degradation of environment.

- ***Stationarity***

The variables (energy consumption, FDI, exports, imports, GDP and CO_2) were taken in a time series analysis and then the stationarity was checked. This is the first and foremost condition before going into any rigorous econometric exercise. The results found are shown in Table III.1 (Appendix III). Thus ADF tests are used and the unit root reveals that the variables are non-stationary at level, I (0) and the null hypotheses (H_0) for the existence of unit root in the variables is rejected. The variables are integrated at first order difference, I (1). The MacKinnon (1996) one-sided *p-values* for the ADF test are 0.00 for CO_2 emissions, energy consumptions, FDI inflows, GDP, exports and imports respectively at 1%, 5% and 10% significance level.

- ***Cointegration***

Since all the variables are stationary at the same order, a cointegartion test can be performed to examine the existence of long run relationship among the variables. The next step is to find out the Johansen cointegration by using Johansen and Juselius test. If the residual or variables are stationary, there exists a cointegrating relationship among the variables. The model for cointegration and error correction is specified as:

$$\mathbf{DLfdi_t = \alpha_o + \alpha_1 DLGDP_t + \alpha_2 DLEx_t + \alpha_3 DLImp_t + \alpha_4 DLCO_{2t} + \alpha_5 DLEnuse_t + \alpha_6 dummy + \varepsilon_t \ (3)}$$

Here, L represents the log & D the first difference of the variables in question.

Fdi= Foreign Direct Investment

GDP = Gross Domestic Product

Imp = Imports

Ex = Exports

CO_2 = Carbon Emissions

Euse = Energy Use

dummy = '1' for 1975-2010 and '0' otherwise

ε_t= Error Term

The results obtained from cointegrating tests are presented in Table III.2 (Appendix III). The results obtained from the test shows that there exists six co-integrating equations at 5% level of significance with the p-values of 0.00 for $r \leq 6$. This shows that at most six cointegration equations exist in long run. Hence the trace tests and maximum Eigen value reveals that there are not more than six cointegrating equations exists in long run.

- ***Vector Error Correction Model (VECM)***

Cointegration test results highlight the existence of long run equilibrium which converges over time. Hence now VECM test can be performed, as it is an appropriate technique to determine the short and long run relationship. The results from VECM are presented in Table III.3 (Appendix III). Error correction model estimation uses the residual from the cointegrating regressor and makes it an explanatory error correcting regressor to cover short and long run dynamics between the variables. An equation is formulated for both short and long run effects as the series are co-integrated. The dynamic model is as follows:

$$\Delta \mathbf{Y_t} = \bar{\mathbf{I}}\Delta \mathbf{Y_{t-1}} + \ldots + \bar{\mathbf{I}}_{\mathbf{k-1}}\Delta \mathbf{Y_{t-k+1}} + \boldsymbol{\alpha}\,(\boldsymbol{\beta}\, \mathbf{Y_{t-1}}) + \mathbf{u} + \boldsymbol{\varepsilon_t} \qquad \text{--- (4)}$$

Here Y_t = Vector of endogenous variables like trade, FDI, CO_2, energy use, exports and imports

Δ = Difference operators

$\bar{I}$, $\bar{I}_{k-1}$ = Matrices of short and long run coefficient

$\beta\, Y_{t-1}$ = Measure of error (deviation) from the equilibrium

u = Vector of constant

ε_t = Error Term

The lagged residuals from the co-integrating equations depict the short and long run effects. The result found clearly shows that in the case of Bangladesh the error correction terms are negative and significant (the foremost condition for VECM). This means that variables are converging together in long run; an equilibrium exists. The variables CO_2, imports, FDI inflows and exports in long run will be at the equilibrium position. This equilibrium is not instantaneous with the coefficient of -0.56. The magnitude of coefficient clearly indicates that maximum adjustment in Bangladesh occurs in a year.

The above equation shows both short run and long run effects and is obtained from cointegrating equations lagged residuals. The results show that few variables are converging in long run together. The results obtained at 1% level of significance shows the speed of adjustment in the table. The results shows positive relationship between FDI and CO_2, which means in long run a 1% increase in FDI leads to 0.41% increase in CO_2. Similarly, a long run positive relationship between FDI and international trade (exports and imports) established. This means 1% increase in FDI will increase 0.33% and 0.24% in exports and imports. However in long run there is no negative relationship between FDI and energy use, FDI and GDP growth, FDI and international trade found.

In a nutshell, in Bangladesh FDI is affecting CO_2 and international trade. FDI is directly proportional to trade means higher the FDI inflows will takes place; greater will be the exports and imports of the country. Similarly, FDI is emission based and releases carbon emission during the process of production, distribution and consumption. This kind of FDI is not environment friendly in long run or in short run as its nature is environment deteriorating. Overall the short run and long run magnitude characterized by causation and the direction of causality among the variables is defined in upcoming section. The causality results will further help to summarize the direction of causality among these variables.

- ***Causality***

The causality test was performed after getting the six co integration equations and strong equilibrium positions among the variables through co-integration and VECM. The results are shown in Table III.4 (Appendix III). The result shows that all the six causalities have unidirectional relationships: CO_2 and imports, CO_2 and FDI inflows and CO_2 and exports, FDI and exports, imports and exports.

The unidirectional relationship between imports to CO_2 with 0.05% probability and from exports to CO_2 with 0.04% probability clearly shows that the environmental problems (emission of $CO_2$and trade of pollution intensive goods) are rising in Bangladesh in long run because of exchange of goods and services. Thus in case of

Bangladesh the theory of Copeland and Taylor (1995) is appropriate. The theory argues that under certain circumstances the pollution intensive industries migrate to countries with weaker environmental regulation (Copeland and Taylor 1994: 755-87). Trade liberalization is a devastating tool for environment and natural resources of developing countries according to the critics who are working on trade liberalization. The emissions of carbon have a deep impact on environment, society, human beings, global warming etc. in long run.

This was similar to the unidirectional causal relationship between FDI inflows and CO_2 with 0.05% probability, which shows that FDI inflows is bringing technology that is pollution intensive, and hence causing environment degradation through CO_2 emissions. The host countries invite FDI keeping the economic benefits (like employment, capital, revenue etc.) of international trade and investment in mind; but forget the environmental implications thus resulting in higher emissions. The theory of "Industry Flight Hypothesis" or "Pollution Haven Hypothesis" supports the argument that countries sometime formulate a more lenient environmental policy in order to attract more foreign capital (Zaman 2012: 8).

Similarly, a unidirectional relationship is found between imports to FDI inflows with 0.03% and FDI inflows to exports with 0% probability. FDI is very important for Bangladesh's development and thus the long run causal relationship is very obvious in such cases because trade and investment are interdependent and go hand in hand. In Bangladesh, FDI inflows is dependent on number of factors such as liberalization of exchange, private sector oriented development, liberalized investment regime and current account convertibility (Rayhan 2009: 100-07). The result found from the empirical analysis shows that import plays a critical role in bringing the foreign direct investment; the direction of causality goes from imports to FDI not the other way round. While, the other unidirectional causal relationship, which is FDI to exports shows that foreign investments raises the production of goods and services, which raises the exports of the country.

Apart from these two causal relationships, one more unidirectional relationship is found from imports to exports. Bangladesh has a trade advantage in importing raw materials from different countries through trade; in return the raw input gets processed into final goods and services and then exported. The reason for this is the low cost labour, less stringent laws and governance, and an open trade market for traders. In the long run, the open trade market for imported goods and services gives rise to exports of finished goods such as readymade garments, chemicals, oils and gases, pharmaceuticals etc. For all these finished goods, raw materials are imported from developed countries (IMF 2012: 6).

Furthermore, no causality was found between GDP and CO_2, GDP and FDI, GDP and exports and GDP and imports. No causality between economic growth (GDP) and international trade (exports and imports) clearly shows that in long run both the indicators will have independent development. This is likely to be true, as Bangladesh is abundant in natural resources and exploits those resources, which further helps in the process of economic growth. The rapid growth of Bangladesh began in the early 1990s after the economic liberalization was substantially implemented. The country faced severe problems such as low exchange reserve, worsening BOP due to rising imports and declining exports prices after the liberation war. This shows that imports and exports since 1975 were not the basis of economic growth that helped increase GDP. The other reason is that traditionally jute was the survival agent of the country's economic engine; but later the jute industry was over taken by cheaper polypropylene products, which resulted in the rapid decline of the jute industry in Bangladesh. For dealing with this, high trade barriers were imposed which declined the importance of Bangladesh in the global economy. Another step taken under the umbrella of nationalization was to directly control the entire manufacturing and services sectors of economy by the government. Thus the prohibited barriers and trade restrictions resulted in no causality between FDI and GDP.

Economic growth and CO_2 emissions reveals no causality, which means that economic growth is not linked with high CO_2 emissions in long run. Therefore, in case of Bangladesh, Kuznets law is not applicable which says that the process of economic

growth in any economy goes through a transition from agriculture to industry and after industrialization shifts to service-based systems. Similar study was conducted by Panayotou (1993: 1-39), in which he found that environmental degradation occurs as the economy changes its structure from rural to urban and from agricultural to industrial. It begins to decline when the economy changes it's from an energy intensive approach to technology intensive and from industries to services because of environmental concerns. Thus in long run both CO_2 and GDP moves independently.

Similarly no causality was found between GDP and energy use, imports and energy use, energy use and CO_2. Energy is an important function of economic growth. In case of Bangladesh no such long relationship exists between GDP and energy use. Mozumder and Marathe (2007) support this finding of no causality between the two during 1975-2010. Research by Temple says that, the energy sector of Bangladesh is very poor as it is unmanaged and featured with poor service quality, huge subsidy from government, limited supply coverage and an inefficient government system (Temple 2002: 3-4). Another study by Buysse et al. (2012) says that the demands for energy are increasing while the supply is inadequate, which results in load shedding and frequent power cuts. The government uses these two ways to manage demand and supply gap (Masuduzzaman 2012: 33). Over time after the adoption of the globalization policy, trade has increased and impacted the energy use and carbon emissions during 1975-2010. This clearly shows that linkage between the trade and environment quality (CO_2 and energy consumptions) exists. In case of Bangladesh, the relationship between energy use and international trade (exports and imports) was found to be nil. The reason can be the cheap labour that Bangladesh offers as a result of its huge manpower that manufactures but does not necessarily consume it, as there is a deficiency of energy.

CHAPTER IV

FDI AND THE ENVIRONMENT: CASE STUDIES FROM INDIA AND BANGLADESH

IV.1 Introduction

The previous chapters (Chapter II and III) of this thesis have proven empirically, that the reforms initiated nearly three decades ago in FDI have undoubtedly had an impact on the environment of Bangladesh and India. These reforms have however provided the requisite platform to both these countries to attract foreign investments. While the theoretical analysis came up with mixed impact of FDI both on India and Bangladesh, the empirical analysis throws up starkly different findings. In the case of India, the findings clearly demonstrate that FDI in India is now a tool of economic and GDP growth as also for trade expansion. (These findings conform to the results of the theoretical analysis). The Indian economy is in a much better position amongst its South Asian peers in its ability to deal with the impact of FDI on its societal, geographic and environmental issues mainly because of its relatively stronger regulatory and institutional frameworks and governance experiences.

The results of both the analysis (theoretical and empirical) of Bangladesh, however, show that foreign investments is mostly flowing into the 'pollution intensive' sectors such as textile and oil and gas. The problem is compounded as these foreign investors use obsolete technology and outdated, inefficient equipment which directly impact the environment and society adversely. Being a Least Developed Country (LDC) with a huge rural population, Bangladesh's environmental standards are poorly placed in the global order due to its weak institutional and legal framework in these areas.

This chapter focuses on select case studies from India and Bangladesh to examine the divergence of the theoretical and empirical studies. In other words, how has FDI affected the society, community and environment of India and Bangladesh? The other focus while analysing these case studies will be to understand, the nature and extent of coordination among the regulatory bodies and institutions dealing with such FDI inflows. In the second part of this chapter, an in-depth analysis of one core case study from each

of the countries has been carried out. For this purpose *GlaxoSmithKline* a leading company in the pharmaceutical sector, has been chosen from India, on account of the latter becoming one of the fastest growing manufacturers and suppliers of drugs in the world. On the other hand, in Bangladesh, gas is one of the fastest growing that receives maximum FDI. *Chevron Corporation*, one of the largest companies in this field has been chosen from Bangladesh for this case study. These two case studies allow us to assess how these foreign investments are functioning and what impacts they have had on society, geography, environment, institutions and technology of their respective host country.

IV.2 Major FDI related Case Studies from India and their Impact on Environment, Society and Regulatory Authorities

In India, four major case studies that symbolize the growing patterns of foreign investments and its impact on India are taken for analysis. The first amongst the four is the infamous Bhopal Gas Tragedy, which even though it happened much before the economic reforms, still plays an important role in shaping the foreign investment policy in India. This is followed by analysis of Kudankulam nuclear power plant, the more recent Korean steel conglomerate POSCO, and the Pepsi and Coca-Cola controversy.

IV.2 (i) Bhopal Gas Tragedy

In 1969, a subsidiary of an American company called Union Carbide installed a plant for pesticide in Bhopal (India) with an unusually large storage capacity of nearly 60 tons of Methyl Isocyanate (MIC) in refrigerated containers made of stainless steel. On 3rd December 1984, this plant turned out to be the darkest spot of the 'worst ever industrial disaster in the world and is infamously referred to as "The Bhopal Gas Tragedy".

The accident turned into a disaster when highly poisonous and concentrated MIC was released in the atmosphere which ended up seriously affecting the dense population living in a radius of 5-8 kms from the plant (Greenpeace 1999: 24-26). On that fateful day, the people who lived around the plant (Kazi camp, Jaiprakash Nagar etc) woke up choking in the poisonous gaseous clouds. They started running around with desperation in an attempt to find relief. Most of those who were able to reach a hospital found

themselves blind and breathless. The death count was estimated to be higher than 10,000, with the ill-effects impacting the genes of the next generation too (Bhopal Memorial Hospital and Research Centre 2008: 1).

Causes of the Tragedy

The plant was established amidst the back drop of India's 'Green Revolution' when the nation facing severe droughts and famine, had to import drought resistant variety of wheat along with other research projects to stabilize the Indian economy. These drought resistant wheat required large quantity of fertilizers and pesticides. To meet the demand, the government hurriedly approved setting up of pesticides industries in India through foreign investments; Union Carbide being one of them (Nair 2005: 3). It was hoped that Union Carbide would resolve the problem of agricultural growth.

The reasons leading to this tragic incident had many versions of the causes and effects. One of the main causes of the tragedy was the excess amount of MIC (80%) filled in the tank, far exceeding the permissible limit of 50%. Cost cutting was found to be the other major reason. The MNC was supposed to store MIC under refrigerated conditions at zero degrees Celsius, but the cooling systems were shut down in for the past five months leading to this unparalleled chemical disaster. This penny pinching tendency of the MNC was further extended to manpower cuts, which resulted in reduction of the maintenance and safety staff by exactly 50% (from the authorized 12 workers to six). Furthermore, the post of maintenance supervisor was eliminated (CSE 2014: 1). It was obvious that safety was a low priority for this MNC. According to Union Carbide (UCC) however, the cause of the incident was purely mechanical. They claimed that the pressure that had built on the release valve caused a chemical reaction due to which the leakage had taken place (Eckerman 2005).

Social and Environmental Controversies

The gas leakage incident caused numerous immediate and long-term effects on health, society, economy and the environment. The societal aspect relating to the tragedy was glaringly noticeable amongst the lower strata of society, who were the worst of the victims. Politicking in compensation, abject corruption, slow medical aid, and weak relief

and rehabilitation programs plagued the aftermath of the disaster for a long time, The mini-township which came up around the plant had become a ballooning centre of commercial activity, with a dense population comprising mostly lowly paid workers living in shantytowns. The lack of coordination between the Indian Government and Union Carbide led to even more suffering for the victims and devastate the society further. The long term impact was not only on human lives but also on lactating women, milch animals, fishes and livestock which disrupted the long term fabric of the society (Bisht: 1-5). The effects of the tragedy are well known and published time to time in reports by Greenpeace, National Environmental Engineering Research Institute (NEERI) and Centre for Science and Environment (CSE). Dumping of toxic wastes from the plant contaminated the water, soil and groundwater in the area too (Laurenson 2011:83).

For causing the unprecedented man-made tragedy, Union Carbide and its Chairman (Warren Anderson) were charged under Indian laws. In response, Union Carbide Corporation (UCC) denied any responsibility for serious offences like manslaughter and grievous assault and adopted various corporate strategies to escape these serious charges. They decided to fight the hearing of the case in India rather than in USA since it expected to get away with much lower compensation in India as against in USA (Dembo et al. 1990: 5). To shift the blame of the tragedy, UCC, which owned 51% of UCIL (Union Carbide India Limited), argued that it was an independent subsidiary and that UCC had no involvement in the designing of the Bhopal plant, although it was factually incorrect. Finally when all tricks to escape the blame failed, UCC tried to convince the then Indian government (of 1989) to settle mutually, so that they could avoid paying a big compensation (Dinham & Sarangi 2002: 90).

The Indian government however decided to deal with the matter solely in the interest of the victims and claimed a compensation of three billion USD. The matter was settled after the Supreme Court judgment on February 1989 that ordered UCC to pay $470 million US$ to the Union of India and the state of Madhya Pradesh. The governments were also given necessary orders to dispense the benefits to the victims. Court also gave the Corporation the deadline of 23 March 1989 to pay up the amount. The claim was accepted by the UCC and it gave an undertaking to the Union of India of

timely payment. However, the compensation did not trickle down and was delayed too, causing much suffering to the thousands of victims who could not pay for the expensive treatment in time (Morehouse and Subramanian, 1986: 8). The Supreme Court of India interfered into the matter and the settlement process, under suit No. 1113, disposed of criminal proceedings of any nature including criminal complaints, damages, personal injuries against Union Carbide and its subsidiaries. The verdict ordered Government of India to supplement the low settlement amount paid by UCI (Supreme Court of India 1989: 1-5)

The problem with the Government of India was the absence of an established emergency response system for both, pre and post disaster. Further, lack of medical facilities to treat such patients, lack of emergency evacuation methods and inefficiencies of the government further aggravated the magnitude of the damage. (Centre for Science and Environment: 230-231). Other problems faced were the limited availability of medical care only to a fraction of the people, recurrence of the symptoms, and lack of sustained relief to victims, high patient-doctor ratio and ill equipped hospitals in proximity of the site of disaster. (Dinham & Sarangi 2002: 98-99).

UCC wanted to resume production within a week of the accident but permitting the plant but the GoI denied them the permission considering the possibility of further risks. The Central and state Government agencies (the Central Bureau of Investigation, the legal courts and the Madhya Pradesh Pollution Control Board) found UCC guilty of the incident and ordered the permanent closure of the Union Carbide plant and barred the company from operating in India in future as well. This tragic incident shook the Indian Government and served as a warning to be extremely careful in inviting foreign companies in Indian economy. That the lesson was well learnt was seen in the 1991 economic reforms policy of India when FDI was allowed with stringent conditions, restrictions and prohibition of direct investments in chemical, nuclear and security sectors.

IV. 2 (ii) Kudankulam Nuclear Power Plant (KKNPP) Case Study

Kudankulam is located in Tirunelveli district of Tamil Nadu and was chosen as the site of the nuclear power plan to be constructed in India. This plant was to come up as part of a MoU (signed in 1988) between India and USSR (Russia) with an estimated investment cost of $3 billion (Business Standard, 13 January, 2013). The main objective of this joint venture was to help bridge the energy crisis in India. Right from the construction stage of the plant in 2002, this project ran into myriad controversies, ranging from the quality of equipment the company was using, safety measures, liability amount in case of accident and liability exemption granted to Russian suppliers for nuclear damage (Kumar and Ambigai 2012: 174).

The exemption given to the Russian vendors was challenged in Supreme Court of India as the exemption (such as poor safety measures and quality of equipment) could lead to a massive disaster. Civil society groups filed a writ petition challenging the issues related to civil nuclear liability and exemptions. Giving such exemption to Russia was accepted by India as a compulsion only because at that time, India did not have any nuclear laws and secondly Russia was the only country at that time that was willing to invest in nuclear commerce in India. India thus had to either agree to the terms of Russia or be thrown out of international nuclear commerce circuit, which would have severely impacted its civilian nuclear dreams (IDSA 2012: 33). The overall world by then had started trending towards an anti-nuclear approach, due the dangers of nuclear disasters (Kitschelt 1986: 57-58).

These disputes were gradually settled in favour of the power plant, and the Supreme Court and Atomic Energy Regulatory Board finally gave a green signal for Kudankulam power generation after closely evaluating various considerations such as the flooding potential during tsunamis, meteorology, proximity to military sites, facilities for storing explosives and so on. The Indian standard of classification also states that the location of KKNPP is in low seismic zone hence chances of any mishaps are minimal. According to the plan, Unit 1 and 2 work was to start in March 2002 and the work on

Units 3 and 4 was to start in 2016 so as to make the plant fully operational by March 2021(Korablinov 2014: 6).

It is to be noted that the protest did not finish even after the Supreme Court verdict; rather the panic and unrest among the local people and civil society groups escalated rapidly inform of hunger strikes, mass protests by the villagers, rallies, campaigns and seminars followed and public meetings. The state and Central Government tried to intervene in the matter, which ended up creating massive social and environmental controversy thus gaining the tag of a "Controversial Project" (Kumar and Ambigai 2012: 12).

KKNPP: Society and Environment Controversy

KKNPP has attracted controversy in the form of various delays and protests throughout its short chequered history. Residents of the surrounding areas along with activist groups vigorously protested the construction of this plant because of the potential effects of radiation on the environment and health. The MoU was signed in 2007 between India and Russia and in the same year there was an informed unanimity in the struggle by the local villagers against the nuclear plant. The PMANE (People's Movement against Nuclear Energy) is at the forefront of the Anti-Kudankulam campaign. The local people, environmentalists and activists groups were opposing the construction of nuclear plant for several reasons:

- Initially the movement was focused only on the diversion of water and usage of agricultural water for the nuclear plant, but later on, when plant authorities assured recycling the water and setting up of a desalination plant, water issue took a back seat amongst the protesters. The focus diverted to issues like environmental hazards, displacement of people and radiation (Srikant 1990: 5-7).

- In India, nuclear energy only caters to 3% of the overall electricity demand, which is insignificant. Giving nuclear energy such a huge importance for the purposes of development was fraught with huge risks and was s not considered a good move. (Thomas 1982: 37).

- The 30 km radius area around the plant with a population of nearly one million people is alleged to be 'tsunami prone' area. In case of any nuclear disaster evacuation would be near impossible.

- It was also alleged that once the nuclear reactors begin to function, it would release a lot of hot water into the sea which consequently will affect the livelihood of the nearby residents in an adverse manner as the water would become radiated (Jhunjhunwala 2010: 5).

- Controversy further fueled when four nuclear reactor valves sourced from Russians officials were found faulty leading to their arrest. The project was started without any public hearing, without sharing of EIA (Environmental Impact Assessment), Safety and Site Analysis report with the Press, public and the people's representatives. This showed that GoI did not consider taking people into confidence; public approval had a negligible role in proceeding with such a huge project.

- Another reason for protest by local people was the violation of the Atomic Energy Regulatory Board (AERB) regulation of having a nuclear plant where no more than 20,000 people can reside within a radius of 5 km of the plant (The Hindu 7 May, 2013).

- As per restrictions of the Kyoto Convention, electricity generation would saturate the hydro resources and deplete the coal reserves in the country in a few decades (Government of India 2011: 1). The excess use of conventional resources (Thermal, Hydro and Nuclear Energy) for electricity production causes environmental risk. The concern with the coolant water and low-grade waste was

that it would possibly get dumped in the sea and thus adversely impacting marine life as also the fishing industry. (Pradhan 2013: 6).

- The KKNPP projects were likely to emit many different chemical elements such as Caesium, Iodine (and its various isotopes), and Tritium etc. These emissions are known to cause cancer, mental retardation, Down syndrome, and defective births.

- Jairam Ramesh, the Minister of Environment and Forests at that time, had announced that due to violation of Coastal Regulation Zone (CRZ) terms by KKNPP in Units 3 to 6, the Centre has decided not give the plant permission to expand the project to these units (Kumar and Ambigai 2012:171).

- This nuclear power plant was a serious terrorist threat to India as stated by Mullappally Ramachandran, the then Minister of State for Home. He had stated that "the atomic establishments continue to remain prime targets of the terrorist groups and outfits" (Deccan Herald: 27, July 2017).

As can be seen from the above points, Kudankulam project has been a controversial project since its very start. This project is not any different from other nuclear plants around the world, due to the similarity of risks faced. There have been major nuclear catastrophes that have taken place in the world like Fukushima (Japan) and Chernobyl (Ukraine in erstwhile USSR) which have caused untold damage to human lives and the environment. These disasters have changed the perspective of the world regarding the necessity of nuclear power plants in countries around the globe (Pradhan 2013: 6).

Despite these warnings, the Indian Government vigorously pursued nuclear energy options as it saw multiple benefits in it for many reasons. This would be the first plant in India importing PWR (Pressurized Water Reactor) technology which was an advanced version of the traditional reactors using heavy water technology. This model of technology is called V-466 model which has integrated safety measures such as passive

heat removal system, hydro accumulators, hydrogen re-combiners and multi-layered safety measures to ensure plant and environment safety (Power technology 2017: 1). From the government's perspective, the huge demand for electricity in India can be met only through such large scale projects. Hence the only thing needed to be done is to reduce the risk associated with such projects. (Poon 2014:3). It was important that only barren and non-arable land be used for such projects for obvious reasons.

The other benefits besides generation of electricity included greater employment opportunities, infrastructural development of the state, enhanced industrial activities and overall prosperity. The government cited statistics such as, the fact that in Kudankulam, approximately 80% population was jobless though potentially an employable workforce. This employment opportunity could also possibly change the migration pattern for people in search of livelihood (Chandrachodan 2009: 4).The government had thus weighed the benefits and risks associated with it. To them the benefits far outweighed the risks, as it was something that could be mitigated.

The Central Government, MoEF and State Pollution Control Board (SPCB) took all precautions to protect the environment and society from the potentially adverse effects of this nuclear project. The Atomic Energy Commission and the Nuclear Power Corporation of India (NPCIL) in its report had mentioned that, the KKNPP has effective systems and measures to resist cyclones, earthquakes, tsunami, shockwaves, tidal waves etc. A public hearing and review of the Environmental Impact Assessment report created by the MoEF, New Delhi was conducted before finally granting clearance to the operation of first reactor in October 2012 (Ibid 2009: 5-6). In the event of any mishap, Nuclear Power Corporation of India (NPCIL) was to be solely held responsible for settling any damage claim under Civil Liability for Nuclear Damages Act (CLND). Though it was prudent to remove the risk altogether of nuclear meltdowns by not making any more, the Government of India maintained that they have better liability and safety laws in place to mitigate such risks (The Hindu, 8 February 2015).

IV. 2 (iii) Pohang Iron and Steel Company (POSCO) Case Study

Steel consumption market in India has huge demand and to be able to meet it, India invited South Korea's Pohang Steel Company (POSCO) in 2005 with promise of incentives. Accordingly, the Government of Orissa and POSCO signed a MoU on 22nd, June, 2005. As per the MoU, POSCO would set up an integrated steel plant at Paradeep (Odisha) with an investment of $12 billion (Mukhopadhyay 2006: 44) dubbed as one of the largest single FDI in India. The planned production capacity of the plant was targeted at 12 million tons of steel. The Indian steel ministry had set a production target of 100 Million Tons for 2020 (EPW 2005: 2888).

Being a resource abundant state, Odisha offered generous terms to POSCO to set up the plant. It owns 26.5% of the total iron ore reserve and 24.37% of coal reserve in India (Orissa Economic Survey 2003-04). In return, POSCO was to develop various peripheral infrastructures such as an integrated township, water supply, and rail and road link to Paradeep (Das 2005: 4678). The key components of the MoU were:

- To develop a captive port and a steel plant of 12 Million Ton capacity at Jagatsingpur district of Orissa.

- POSCO was given access to mining and iron ore facilities for the project in Sundergarh's Khandadhar mines, which is spread over 13,000 acres of area. Permission was also granted to POSCO to swap the low-grade iron ore by exporting the same and replacing it with higher quality imported ore.

- Development of transportation in the region by developing road and rail links as also development of a dedicated port. The transportation project also included a railway line, dedicated to the Paradeep mine belt.

- Development of integrated township in an area spread over 2000 acres and the head office (HO) to be set up in Bhubaneshwar.

- Project area to be declared a Special Economic Zone (SEZ) to enable access to tax holidays and subsidies.

The development of water project from Jobra barrage (Mahanadi River) for the supply of 12000-15000 crore litres of water (Debaranjan 2008: 4).

The plan seemed simple to implement, but turned out to be entirely a nightmare for POSCO. The project faced severe criticism from the activists and locals immediately after the MoU was made public. This criticism gathered momentum and soon massive protests broke out especially by the locals. The state government unexpectedly favoured the POSCO project instead of favouring the locals and the environment. Being the biggest ever growth opportunity for Odisha in a long time, the state Government extended their support by providing round the clock protection to the project and used force frequently to break the back of these movements. Seeing the determination of Orissa government to support the POSCO project despite violent protests by the people over multiple issues, the Supreme Court in 2008 ordered MoEF to examine whether the project met the environmental and ecological laws of India. In July2010, N C Saxena, and his 19 member committee found violations of Forest Rights Act under POSCO-India Project and urged MoEF to withdraw the clearance given to Orissa state government to divert the forestland for the project.

MoEF followed the committee report and ordered the Odisha Government to stop work on land acquisition and forest-land handling. In October the same year, a four-member committee headed by Meena Gupta (Former Environment Secretary) was constituted to examine the social, environmental and ecological impacts of the Project. The three members of the Committee's report clearly found the Project as illegal as it violated many laws as follows:

- The forest clearance was given without the consent of Gram Sabha and was thus illegal. The MoEF had no right to diverting land on its own.

- The project had many dangerous environmental impacts as pointed out by the State Pollution Board such as water availability issues, air pollution, flooding and many more and as such untenable under environmental laws.

Whilst the three members of the committee recommended the clearance of the project after cancellation of the EIA (Environmental Impact Assessment) and CRZ (Coastal Regulation Zone) requirements, Meena Gupta, however, in her report insisted that EIA must be carried out on the project proposal. After so many different viewpoints and reports, Mr. Jairam Ramesh (Former Union Minister, MoEF) on January 31st 2011, finally gave clearance to POSCO-India Project. NGT (National Green Tribunal) made a fresh review of the report and found the report of Meena Gupta, a balanced one. NGT buttressed her report by adding that as POSCO brought in highest ever investments to India, its presence would result in greater industrial development and employment opportunities. NGT added a rider that while industrial growth was essential, nevertheless, it must satisfy sustainable development and environmental issues as also take all precautionary measures to address ecological concerns. Hence EIA was required to be carried out before environmental clearance was accorded (Mishra 2017: 157).

The MoEF in 2011 gave clearance to POSCO India stating that the project was not violating the Forest Rights Act of 2006, an act that was intended to protect the forest dwelling communities. Neither the Odisha Government, nor the Central Government, nor POSCO have revealed any significant information about the project which got delayed because of controversies and wide ramifications on regional economy, society and environment. Still not assuaged, the locals of Village Dhinkia, (ground zero of POSCO project) started the POSCO Pratirodh Sangram Samiti (POSCO PPSS) – an anti POSCO resistance movement "POSCO PPSS")–to protest on various issues as covered below.

POSCO: Society and Environment Controversies

The picture of POSCO was not as it seemed on paper. Controversies erupted when it came to light that the government and POSCO had reached an agreement without any environment clearance and matters of compensation to the affected populace. In December 2007 and on 1stApril, 2008, people from all parts of the state (mostly from

Kalinga Nagar region) joined in the protest against POSCO. The major issues for the people in this area were the acquisition of their land used by them for betel cultivation (their main source of livelihood), displacement and rehabilitation and the violation of Forest Rights Act. Moreover, the State Government has had a notorious history of going back on promises of fair compensation to the displaced locals like in the earlier cases of Hirakud Dam Project and Nilachal Ispat Plant Projects (Kutty 2006: 4-5).

The social, environmental and economic controversies over this project were recorded as follows:

- Displacement of communities from villages was a major concern as the villagers did not want to move from their homes where they were able to eke out a sustainable and livelihood from agriculture (mostly betel cultivation). Migration too, they felt, would be extremely difficult for them to adjust as neither they may get arable land suited to their betel cultivation (which they were used to since centuries); nor adjust to urban lifestyle which they dreaded, as they would have to work as daily wage labour under someone else in urban areas which they were not used and may further lower their living standards and more importantly their self-esteem. (Mathur 2009: 5).

- Setting up of a separate private port at Paradeep when a functional port run by the Government already existed in the port town (Pingle, et al. 2010: 9-18).

- Giving SEZ status to POSCO by Ministry of Commerce and Industry would result in an estimated loss of Rs 89,000 Crore to the Government of India and Rs 22,500 Crore to the government of Orissa spread over 30 years (The Hindu: November 10, 2012).

- POSCO getting access to 600 million tons of iron ore with a royalty payment of only Rs 27/ton to the Government of Orissa as compared to the then market price Rs 6,000/Tonnes.

- POSCO proposed to tap 250 million litres of water a day for its industrial use from the Jobra Barrage on the Mahanadi River. The Taladanda canal, which starts from the same barrage, is the lifeline of Cuttack and Jagatsingpur districts of Orissa and would have meant depletion/reduced availability of this precious resource to those dependent on only this canal (Debaranjan 2008: 4).

- Jagatsinghpur where plant and port are proposed to be set up is a productive agriculture land, conducive for wide range of crops such as cashew nut, paddy, spices, betel besides - other forest products like bamboo and plenty of dry wood as fuel by the villagers. Fishing and shrimp harvesting are the other major sources of income for villagers living near the coast. Livelihood of hundreds of thousands of people would have been impacted.

- Violation of Human rights: Forcibly evicting people from the villages where the plant is being set up was tantamount to violation of human rights. Protests by the affected people resulted in arrests and police barricade of whole villages and schools, thus forcing them to live under siege. Moreover levying of fabricated criminal charges was levied against the protesters by the state police (IHRC and ESCR-Net Release 2013: 2).

- Compensation for lost agricultural lands, houses in lieu of houses destroyed and transportation was promised. Similarly compensation was also promised to landless labourers, fishermen and farmers. POSCO agreed to give compensation through Rehabilitation and Peripheral Development Advisory Committee formed by Government officials. Unfortunately, the compensation doled out was much lesser than their current cash incomes. Job security which was promised was only a mirage (Balaton-Chrimes 2015: 18).

Due to the aforementioned reasons a serious debate started within and outside Odisha as it was believed that POSCO will worsen the plight of local communities, environment and its natural habitat. This project is likened to surrendering the sovereign rights of state resources to a vague, non-transparent project of foreign investor without assurance of economic development of the people and the state. Such controversies, large scale protests and wide media coverage helped in suspending the project for nearly two years. On 6 January 2014 the environment ministry revalidated the environmental approval for the project. Notwithstanding all these raging controversies, the Government of India in league with the state Government gave the go-ahead signal for the POSCO project. In spite of getting the final clearance, POSCO, was not able to make much headway in acquiring the desired amount of land and mining rights or in their other legal fights (Mukhopadhyay 2006: 2). Finally in Apr 2017, Odisha cancelled the land allotment to POSCO saying that it had not shown much interest in the project and that the land had remained idle for more than three years (Business Standard: April 29, 2017).

IV.2 (iv) PepsiCo and Coca Cola Case Study

Coca-Cola and PepsiCo are America based soft drink companies that produce concentrates, which is then sold to licensed bottlers throughout the world. PepsiCo entered the Indian market in 1988 through a joint venture (JV) with Punjab Agro Industries and the Voltas subsidiary of the giant Tata Group (Crossette: September 20, 1988). Coca-Cola re-established itself in India by acquiring Parle Exports a locally owned bottling company in Oct 1993 (Budhwar and Varma, 2011: 106). These two multinational companies captured 90% of the Indian market with varied varieties of food and beverage products.

The first time the operation of these two investment giants came in limelight was in 2003 when the Centre for Science and Environment (CSE) [20]published a report highlighting the use of pesticides, the quality of water in the production of beverages and its harmful effects on humans. CSE performed a lab test on 12 brands of soft drinks sold

[20] CSE is a Non-Governmental Organization in New Delhi, India.

in India (Delhi) and analysed the results using USEPA[21] method. The results obtained show the presence of poisonous pesticides in all brands. The pesticides present in Coca-Cola were 0.015mg/l and in Pepsi it was found 0.018mg/l. This amount was 30 and 36 times higher respectively than the norms prescribed by European Union (EU). These limits were even greater than the limits set by the Bureau of Indian Standards. The same product in the US had no residue of chemicals.[22]As India did not have laid down pesticides standards, hence the limit of 0.0005mg/l. was followed as determined by the EU. The pesticides identified in these soft drinks were 12 organo-phosphorus pesticides and 4 synthetic pyrethroids that are commonly used in the agricultural fields and in households to ward off pests. (CSE 2003: 9-10).

In 2003 (August 5) when CSE released the results, both (PepsiCo and Coca-Cola) submitted a writ petition in Court stating that an NGO, being a private entity, has no sanctity in law and no legal authority to publish such statements, and hence requested the court to ask CSE to withdraw the published material and in future stop such statements from being circulated. The Supreme Court out rightly rejected the petition. PepsiCo had claimed that they followed EU norms which are much more stringent than WHO prescribed standards. A parliamentary level committee was created in 2004 to look into the controversy. This committee backed the findings of CSE and further created a government appointed committee that developed standards for soft drinks (first in the world to do so). The government also conducted two tests in their own labs (CFTRI, Mysore & CFL, and Kolkata) and the results were presented to the then Union Minister of Health and Family Welfare, Sushma Swaraj. On 21 August 2003, Sushma Swaraj, in Lok Sabha, over-rode the results of CSE and state that the products being manufactured by Coca-Cola and PepsiCo were within the safety limit of EU samples. This was a clear chit for soft drink companies to continue manufacturing. This controversy led to an 11% drop in the sales for the beverage companies, with several states banning the sale of the Colas (The New York Times, 7 August 2006).

[21] USEPA is a United States Environment Protection Agency which protects human health and environment by enforcing regulation based on laws.
[22] Referred from CSE, New Delhi & Coca Cola websites.

The companies argued that the levels of pesticide were in any case common to many other food products in India because of the usage of insecticides during farming. The controversy did not end as the people, government and civil society groups asked for a high level enquiry into the quality of the products. The Coca-Cola and PepsiCo controversy is important to study because these companies claimed high degree of social responsibility and adoption of high standards of production (ISO standards), without undermining health of the people and the environment. (Bremner 2006: 6).

Coca Cola and PepsiCo: Society and Environment Impact

Protests soon began in states besides Delhi after the release of the CSE report. In 2003, a battle began between the Companies and Plachimada Village Council, later backed by the Kerala government for exploiting ground water and disposing hazardous sludge at Plachimada in Kerala. The plant has ever since been shut down as the long running legal dispute between the Kerala government and the Company continues. The story was repeated in UP as well; Coca-Cola was accused of depleting the groundwater supply and resorting to illegal effluent disposal practices and human rights abuse in Kaladera (Rajasthan) and in Mehdiganj (UP) (Amine and Kumar 2008: 4) . The Uttar Pradesh Pollution Control Board (UPPCB) ordered the plant in Mehdiganj to shut down for using water beyond permissible limits. The National Green Tribunal (NGT) in a surprise move stayed the order and allowed the company to continue operating the plant so long as they used its 'Returnable Glass Bottle Line'. Not satisfied by the NGT clearances and the Government's approach to the controversy, NGOs and society activists raised various issues against Coca Cola and PepsiCo, which are as follows:

- *Health Effects*: Regular intake of phosphoric acid in the water was suspected to increase the chances of osteoporosis. These pesticides are known to cause cancer and lead to a breakdown in the immune system. The products manufactured by PepsiCo and Coca Cola are processed which contains high amount of sodium, sugar, fats and calories which have huge health risks for children and adults. The tiny toxins of pesticides accumulate in bodies and causes immune suppressive affects which triggers deadly diseases such as asthma and cancer (Centre for Science and Environment, 2004: 10-11).

- *Pesticide Contamination:* The amounts of pesticides found in the drinks were very high. Also the quality and quantity of water used contained toxins. The pesticides found in the drinks were Lindane, DDT, Malathion and Chlorpyrifos which are harmful for human consumption.

- *Packaging and Recycling*: Coca-Cola vehemently opposed any attempt to reduce the environmental impact caused by the use of its containers through legislations governing container deposits (CSE 2003: 8).

- *Environmental Degradation:* The utilization of 2.5 million litres of water every day from natural water sources by the company posed a serious threat to many communities as did the improper recycling of the bottles. The Pepsi plants were polluting the lands with effluents causing depletion of ground water and reducing the fertility of the arable land. In 1992 it was found that PepsiCo and other beverage MNCs were creating 10,000 metric tons of plastic in the production and importation process. Out of that only 60-70% was recyclable and the rest caused huge plastic non-recyclable wastes. Similarly in 2006, farmers complained that due to excess use of water in these beverage plants, growing of crops was becoming hard (Berch et al. 2010: 6). In 2006 a study of TERI on Coca Cola plant located in Kaladera, Rajasthan confirmed that the extraction of ground water was1.35 times than the natural recharge rate annually which resulted in exploitation rate of 2.47 during year 2004. This led to a drastic drop in ground water level by 38 meters in last 20 years from the then existing level of 9 meters. This had serious impact on people, agriculture, health and the environment (Karnani 2012:14)

In November 2010, the Supreme Court of India nullified a criminal complaint filed by the Kerala government against Pepsi. The court found that the beverages did in fact meet the standards prescribed at the time the allegations were made. The beverages were "within the tolerance limits subsequently prescribed in respect of such product"

(Fortune 2007: 618). The companies resumed production and committed to “building sustainable communities by reducing environmental footprint, support active, healthy living, create a safe, inclusive work environment and contribute to the development of the communities wherever they operate”. PepsiCo, in 2010, had amongst "the most impressive corporate social responsibility credentials in emerging markets", according to the US State Department (Embassy of the United States 2010: 2). The Indian unit of PepsiCo also received recognition based on its safety practices and water conservation efforts. Prioritizing the health concerns PepsiCo launched low calories soda, baked chips and other healthier alternatives (Frito-Lay Company) by employing health officials and investing in health products (DFEI 2010: 9).

Similarly, Coca Cola has started initiatives such as “Support My School” and a training program for retailers and women as part of the 5BY20 campaign run globally under company’s flagship program (Coca Cola India 2012: 2). Further, Coca-Cola was listed as a partner of the “RED” campaign, which targeted reducing and preventing the HIV virus transmission to children from their mothers (the campaign's by line being "Fighting for an AIDS Free Generation"). PepsiCo unveiled in 2011, the world’s first plant-based PET bottle. This PET bottle is a 100% recyclable and is made from various plant based materials such as corn husks, pine bark and grass. PepsiCo plants also improved its ratio of water usage by nearly 47% and reduced the total consumption by 66%. Initiatives such as these helped in contributing to the local economy, society and the environment (PepsiCo PR Newswire 2011:4).

To summarise in the Indian context, the four case studies discussed in this section viz., the Bhopal Gas Tragedy, Kudankulam Nuclear Plant controversy, PepsiCo and Coca Cola controversy and the largest FDI- POSCO India, clearly shows that the people, civil society and government have become increasingly proactive and rigorous in dealing with the pre and post effects created by these foreign investments. While FDIs were ready to reap the positive benefits and outcomes of such investments, they tried to deliberately gloss over the disastrous negative impacts their ventures had on the environment and society in the host country. There are sufficient cases and evidences (including the case studies in section IV.2) to reasonably conclude that while FDIs do cause environmental

degradation by and large, but they can be turned into a boon by concerted action by the affected communities, the activists and the State and Central Governments.

IV.3 Major FDI related Case Studies from Bangladesh and their Impact on Environment, Society and Regulatory Authorities

In Bangladesh four major case studies are taken that symbolize the impact of foreign investments on various aspects of the environment. These are the textile sector case study, the Niko case study, the Magurchara and the Lawachara case studies. These four major case studies have been chosen to ascertain the quantum of investments made by these MNCS and corresponding ways, these foreign investments left an impact on the environment, society, politics and regulatory authorities of Bangladesh.

IV. 3(i) Textile Sector and Rana Plaza Case Study

The emergence of textile sector in Bangladesh began in 1950s, when trade unions were becoming increasingly organized in developed countries leading to higher wages and higher costs of production. Retailers turned towards developing economies such as Hong Kong, Taiwan and South Korea where the cost of production was cheaper due to open and friendly economic policies, and cheap labour force.

To maintain control over the import of readymade garments (RMG) being imported into developed countries from developing countries, a Multi-Fibre Agreement (MFA) was adopted in 1974 (Islam 2013: 32) in Bangladesh. Since early 1980s, Bangladesh started receiving investments in textile and garments sector mainly because of quota free policy and cheap labor which started playing a very key role in its economy (Chowdhury 2014: 104). Within Asia, it has been one of the biggest exporters of textile-based products thus providing employment to a significant percentage of the workforce in the country. In 2012, Bangladesh Textile Mills Corporations (BTMC) mentioned that Bangladesh was the second largest clothing exporter after China with $24 billion annual exports of readymade garments and that it contributed to a 15% share of the GDP. The garment sector accounted for nearly 50% of its industrial work force and about 77% of the foreign exchange earnings making Bangladesh a cheap and popular outsourcing destination for many international clothing and garments brands. These multinational

companies were making huge profits at the cost of low safety of workers, environmental hazards and health of the population. It is often thought of as one of the most ecologically destructive industries in the World (European Commission 2007:1). The main challenge posed by this industry arises when environmental sustainability is ignored by the textile sectors both at processing stage and supply chain stage. The biggest example of such unsustainability is the Rana Plaza disaster.

Textile Sector: Environment and Society Controversy

This sector has created growth opportunities for Bangladesh through employment generation, new industries, women participation (80% women workforce) and increased export earnings. Developed countries explore the market through Bangladesh, as the cost of doing business is very low and policy regimes are favourable due to lucrative incentives. Bangladesh textile sector (readymade garments) has access to global market through the bilateral agreements with 28 countries and EU's GSP (Generalized System of Preferences). The growth of readymade garments sector has given a significant position to Bangladesh in Europe and North American market due to free access under GSP. The investment opportunities allowed by the Bangladesh Government are private and foreign investments in the textile sector, joint ventures, indirect investments (leasing or financial services) and acquisitions (BIDA 2015: 2).

There are numerous complaints that the working environment in factory for workers is below par. The labour exploitation mentality of some garment owners and international brands was a major roadblock to developing a sustainable readymade garment industry. The workers were often exposed to dust, fumes, fire, gas, flames, loud noise, extreme heat, dangerous tools and dangerous work locations without the proper protection and safety in place. Furthermore, it had environmental impacts as well, as this sector used obsolete techniques of production that were pollution intensive (Khan 2011: 47). The processes followed by the textile industry, right from production to the last step in the supply chain process had a negative impact on the ecology. Production processes required bleaching and dyeing, both of which caused toxins to creep into the ecosystem. The effluents in the industrial regions ended up with suspended solids, salts, heavy

metals, and waste acids as there was no treatment of wastes undertaken by the manufacturers before discharging. These effluents also impacted public health, wildlife, livestock and the ecosystem as a whole. Since people living around the area had to use the surface water for their household purposes such as bathing, fishing, washing etc. they were directly vulnerable to various diseases (Akhtar 2014: 45). The toxic dyes were used without any processing and caused a huge adverse impact on the environment and health (Islam 2011: 438).

Such strong demerits of textile sector in Bangladesh as a whole came to light only after the collapse of Rana Plaza factory in 2013 and is considered as one of the worst industrial disaster since the Bhopal Gas Tragedy. This led to the start of initiatives to develop sustainable workplace in Bangladesh garment industry with the involvement of 100-odd international companies operating in the country along with, retail manufacturers and trade unions who were made to sign the Accord on Fire and Building Safety (AFBS). The objective of the accord was to prevent workers from the fear of fires, building collapses and enable a healthy and safe working environment (Bangladesh Accord 2016: 1).

The Rana Plaza Incident

Rana Plaza was an eight-story building located in Savar (Near Dhaka) that housed multiple garment manufacturers. The building collapsed catastrophically on April 24, 2013 leading to death of 1,129 people. The investigating committee, appointed by the Interior Ministry identified one of the main causes of the collapse to be the illegal and unplanned construction of two more stories beyond the sanctioned six (The Guardian, May 23, 2013). Most of the victims working in Rana Plaza garment were working for European and Canadian companies. Export contracts from these countries helped Bangladesh to become the world's second largest exporter of clothing. The manufacturing units of multinational companies like Benetton, Cato Corp, Loblaw's (Canadian Company), Joe Fresh, Primark's and Cedar wood State (UK Companies) El Corte Ingles (Spanish Company) were operating out of this building (Quelch 2015: 4).

There were several reasons for the collapse; one being that the authorities did not take any precautionary steps to test the soil or investigation of site prior to the construction of the building. This casual attitude of government had given encouragement to land owners around the Rana Plaza building to fill up water bodies with soil and debris for constructing high-rise building over this loose earth. The soil at the bottom of the erstwhile water body was made of clay which was unable to bear the heavy load of the construction (Islam 2013: 30). Coincidentally, the cracks in the Rana Plaza building was noticed by engineers a day earlier. After further examination, they informed the management of the vulnerable nature of the building and the need to seal it off immediately. Ignoring the report, the management of the garment factories threatened the worker with cutting their wages if they did not turn up for work. Being poor, the workers had no option but to turn up to earn their daily wages.

Another major reason for the collapse is attributable to the heavy duty generators in the building to cater for frequent load shedding. The vibrations created by these heavy generators shook the pillars of the floor below continuously thereby, weakening and further triggering the collapse. This resulted in the collapse of one floor which caused a chain reaction causing the whole building to implode. More than 3000 workers ended up getting trapped. (Otlewski 2014: 12). The locals, the army and the hospitals undertook immediate rescue and recovery efforts Prime Minister Sheikh Hasina ordered a high level enquiry and an immediate action against the culprits. The government of Bangladesh rejected the help from external sources from UN and UK fearing damage to their national pride. This resulted in higher casualties owing to lack of modern search and rescue equipment. This disaster ended up with thousands of broken families and bleak future staring ahead of them (Ibid 2014: 15).

The collapse of factory sent a message and ignited a debate across the globe on the role of multinational companies (MNCs), governments and pressure groups regarding on the state of working-condition of workers in the textile industry in Bangladesh. (Henniker 2014: 1). Various bodies ranging from international organizations to local institutions demanded improvement in the working conditions for the workers in the garment sector. As a result, the “Accord on Fire and Building Safety in Bangladesh” was

signed by the UNI Global trade union, Industrial All Global Union, and more than180 business enterprises (mostly Europeans). The accord was aimed at strengthening the safety levels in the textile industry as also improving the standards for health (D'Ambrogio 2014: 7) Apart from international organizations and the government, the role played by local institutions and large retailers in rescue operations and providing relief was commendable.

Ever since the disaster, the citizens of Bangladesh took to the streets to voice their demands. . One of the largest protests occurred in 2013 when several thousand workers marched through Dhaka to protest the pathetic working conditions and demand for higher wages. The unrest continued, as workers demanded an increase in minimum wage from $37 per month to $104 per month. The Bangladesh Garment Manufacturers and Exports Association (BGMEA) succumbed to the pressure of the protestors and government and raised the minimum wage to $68 per month. The United Nations and the Government of Bangladesh also created a joint initiative in the form of the Alliance for Bangladesh Worker to encourage safety and empower the industrial workers (*Schwier 2013: 4).*

IV.3 (ii) Magurchara Case Study

With the increasing population and socio-economic development the total consumption of energy in Bangladesh increased substantially which led to more foreign investments coming up in the energy sector over the years. The country witnessed rapid spurt in investments in the oil and gas sector. Bangladesh is now the 7th largest producer in Asia of natural gas and meets nearly 56 % of its own domestic energy demand. Companies such as Chevron, Petrobangla, Bangladesh Petroleum Corporation, Statoil, ONGC, and Gazprom dominate the energy sector (EIA Beta 2015: 2). Conventionally, the risk associated with the energy and power sector is very high as it is prone to fire, explosion and collapse. Therefore, the precautionary measures were very important to be ensured by both the government and investor. (Mtui 2013: 317). In Bangladesh, the lack of stringent laws and weak enforcement were the main reasons behind incidents like that of Lawachara, Magurchara and Tangratila. This ignorance of the local authorities and regulatory bodies encouraged the foreign investors to fully exploit the resources by

disregarding the environmental and societal impacts. Several incidents of gas explosion took place in Bangladesh in the MNC operated oil and gas fields. The explosion in Magurchara is one such incident and is a prime example of negative effects of FDI in energy sector.

Magurchara is a quaint locality situated on the Moulvibazar gas reservoir in the hydrocarbon rich area of Surma basin (Alam 2010: 88). The fields were discovered in 1989 by Occidental Company, which started drilling their first well after completing the necessary survey under the terms of the Production Sharing Contract (PSC).The explosion in 1997 was blamed on Occidental, who neglected precautions during drilling. The foremost condition in gas exploration is to exert pressure into the formation (earth) by applying proper mud weight in order to balance the formation pressure of the 'pay zones'. If due to any reason, the formation pressure supersedes mud weight pressure, the well along with the drilling rig becomes potentially vulnerable to explosion (Bhardwaj 2001: 73). Apart from the wrong way the drilling was conducted, another reason for failure was the faulty cementing operation. One of the pumps was found to be operating erratically. Additionally, the pocket of gas that caused the blowout was located about 1 mile (2kms) above the gas deposit the well was meant to tap.

The pocket had been identified in earlier seismic studies but was hit unexpectedly at the time of the drilling due to negligence on the part of the contractor. After the incident, in 1998, Unocal Corporation and the International Finance Corporation (IFC) () entered into Production Sharing Contract (PSC) with Occidental. The explosion damaged nearly 60 hectares of natural forest with a burnt area of around 300 hectares. The fields caught fire in 1997 causing damage to the environment, property and life. The explosion caused extensive damage to the environment; it destroyed many tea gardens and laid waste to nearly 700 acre for reserved forest land. The fire also affected the lives of the tribal people who lived and worked nearby. Farming was affected especially in the rift valley and under the rift valleys due to infertility in the soil caused by the fire (Nayeem 2011: 1). The damage of gas resources was worth of $1 billion and environmental damage of estimated at $2.5 billion including destruction of 29 tea gardens. A cluster of forest-dwelling *Khasia* population were forced to migrate and had to suffer social,

economic and psychological trauma. Wild life too suffered, as many of the local animals and birds had either migrated or destroyed in the fire (The New Nations 2006: Energy). The effect of the incident is clearly visible on society, geography and environment even after three decades.

Despite these circumstances, Occidental was given an extension on their contract (which was set to expire on Jan. 10, 1998) because of the pressure exerted by US. They remained in Bangladesh until July 1999 with a nominal compensation of $10 Million (Swapan 2009: Comment Section). This incident was a clear sign of failure of government and the foreign investor (Occidental). Later in 1999, Occidental handed over the plant to Unocal, another US based company and left Bangladesh. The compensation promised by the Occidental before leaving the country was rejected by the Bangladesh authorities for being too less. In 2004, Minister for Energy and Mineral Resources (A.K.M Mosharaff Hossain) states that Bangladesh has decided to claim compensation through international court. The government at that time (Awami League) initially left them without compensation but after considering the injuries, infrastructure damages, cultivated land and disastrous effect of the incident, $660 million was awarded. The damage caused by the accident was permanent in nature. (GOC 2004: 1).

The result of internal politics and callous attitude of the government towards law, environment and society had disastrous ramifications on the people and the ecology in the area.

IV.3 (iii) Tengratila Gas Field Explosions (A Niko Case Study)

Niko was founded in 1987 and is a huge multinational oil and gas company based out of Calgary, Canada. Niko focused on one unexplored gas field- Chhatak East, where Tengratila is located. In the 2003, Niko signed a Joint Venture Agreement (JVA) with BAPEX (Bangladesh Petroleum Exploration and Production Company Limited) for petroleum development and production from Chhatak and Feni gas fields. Niko also signed a deal in secret with Chevron-Texaco, purchasing Block 9 at a throw away price in 2003 (Sheikh 2014: 10). Niko started drilling operations from 2004 (December 31) at Chhatak-2 with plans to expand drilling to Chhatak West (three development wells) and

Chhatak East (one exploratory well). The joint management committee of the agreement had not approved the drilling of the first well at Chhatka-2. Two gas blowouts took place in 2005 in Dowara bazar at Tengratila Gas Field which was owned by Niko. The first blowout was on7th January 2005 and the second blow out occurred on 24th June 2005 (The Daily Star, 14 June 2008).

The incident prompted the Ministry of Energy to form an enquiry to identify the causes and damage due to the blowout. The findings clearly state that Niko was entirely responsible for the incident and the blowout was the result of operational failure and inappropriate casing design. The committee also states that technical lapses in the operation and gross negligence were the core reasons of the blowout. Niko started the "drill through loosely consolidated sand unit following upper marine shale without setting casing in the loose sand unit; the drillers began to pull out the drill string at the project unit. This caused a swabbing effect on the gas zone and gas was forced into the drilling hole, which ultimately caused the blowout" (Nasir and Islam 2014: 111). The reasons of the second blow out were the same as first one when the Canadian company tried to "drill a relief well to kill the main Chattak-2 with mud and seal it off with cement. It was planned to finish drilling up to 466 meters but at 435 meters, an explosion took place. Sudden uncontrolled mud was lost in the relief well, causing a very high flow rate of gas coming up through the well to the surface and resulted in a huge blowout. The rig too was caught in the fire" (Nasir and Islam 2014: 111). The total loss incurred in first incident was much lesser than the second one. In the latter blowout, flames leapt up to 500 feet and continued to burn for more than ten days.

The Niko gas exploration of 2005 caused severe damage to people, environment and society. The blowouts damaged the geologic structures and nearby surface areas. The immediate effect of explosion was visible on January 8, 2005, when ten thousand panic-stricken people fled their homes staying in the vicinity Tengratila gas field. Some people who remained were able to survive in that unfavourable environment but their social and economic status changed for the worse (Nasreen 2006:12). The blowout burnt 500mmcf of gas in the first seven days and about one billion cubic feet gas in the relief well that had been drilled. Total loss of soil resources was divided into four categories; "most"

affected areas (50 Hectares of land), “very” affected areas (main field to 2 KMs radius), and “moderately” affected area (2-4 KMs from main blowout area) and “less” affected area (beyond 4 KMs). The effects were so devastating that government had to intervene in the matter for obtaining compensation from Niko, to pay the locals.

Niko at first was unwilling to compensate for the loss in 2005 to property and environment forcing the Government of Bangladesh and Petrobangla to file a damage suit in Dhaka Court against Niko claiming compensation of Tk 746.50 Crore. Niko was ordered to appear on the scheduled date before the Court. Petrobangla in a legal notice earlier had asked Niko to settle the matter outside the court which was ignored by them. Bangladesh Environment Lawyers Association (BELA) also filed a case against Niko challenging the deal in High Court in 2008 (Government of Bangladesh 2005:4). Niko did not respond to the compensation demands in High Court either. Hence the case was filed against Niko in International Centre for Settlement of Investment Disputes (ICSID) in 2010. The ICSID under case No ARB/10/11 and ARB/10/18 scheduled the case for hearing in the presence of both the parties and the ICSID President (ICSID 2014: 2).

The case was filed under Article 143 of the Constitution, which stated that the Government owned the natural resources of the country and that Niko has destroyed the same due to lack of efficiency, necessary skills and sheer negligence of procedures. Under Article 3 of the agreement between Niko and BAPEX, the responsibility and compensations for any accident during the extraction operations of petroleum (at Chhatak and Feni) was to be dealt by Niko alone. (The Daily Star, 21 August 2013). There was another claim on Niko on selling the properties (both movable and immovable) without any government order. In the judgment of International Tribunal, Niko was banned from selling any asset without the permission of Bangladesh government and the case was to be settled at the local court.

Niko filed a case against the Government of Bangladesh stating that they owed US $27.31 million which was not yet paid (Seraj 2014: 1). The case was dismissed by the Tribunal with the verdict that “The Tribunal has no jurisdiction over Bangladesh, which therefore no longer is a respondent in this arbitration″. The Tribunal further stated that Petrobangla was also not responsible for the compensation as it was a joint venture

between Niko and BAPEX. Hence the Court of Bangladesh had the authority to take the final decision. On the matter Hussain Monsur, Chairman Petrobangla said ICSID had given the authority to Court of Bangladesh to take the final decision and that the decision went against Niko. The result of the gas blowout incident led to the framing of two laws; one for energy exploration in Bangladesh and the second one on the compensation structures that were required to be put in effect.

Niko still continues to operate in Bangladesh by obtaining a clean chit from the authorities (The Daily Star, 8 July 2014). This is in stark contrast to India where Union Carbide was not allowed to operate post the Union Carbide gas explosion in Bhopal. The difference in the way of handling of man-made disasters arising out of FDI greed between the two countries couldn't be starker.

IV.4 Findings of Field trip from Chevron and Lawachara Controversy, Bangladesh

Perusing interesting and important case studies on FDI's impact of the environment in Bangladesh, a need was felt to undertake a field trip to gain first hand exposure of the ground realities. The Lawachara National Park in Bangladesh is the project site of Chevron Corporation[23] under the funding of United States Assistance for International Development (USAID). This meant that the project had the government approval and the co-management body consisted of stakeholders from MoEF, local NGOs and Forest Department to protect the forests. This project also gets technical support from the Environment Department and Wildlife Trust of Bangladesh (Gain 2013:155).

Nishorgo Project of Lawachara National park was selected for the field study. The project site was chosen in order to understand the efforts taken by the MNC (Chevron) in preserving the protected forest areas declared under the International Union for Conservation of Nature (IUCN).The other reason for choosing this site was to analyse how IUCN operated with the co-management approach mentioned in the preceding

[23]Chevron Corporation is a USA based MNC and is one of the world's leading integrated energy companies (In petroleum explorations). The company is involved in virtually every facet of the energy industry and explores for, produce and transport crude oil and natural gas; refine, market and distribute transportation fuels and lubricants etc. including researching advanced bio fuels.

paragraph. Protection of its environment should have been the top priority for Lawachara National Park .Strangely however; it had allowed Chevron to conduct a Seismic Survey in the Park, which resulted in major damage to the forest area in the process. The main purpose of the field trip was to obtain first-hand information on Chevron's projects and its operation in Bangladesh, for which a visit to the Chevron Project site and its Corporate Office was undertaken.

Background

Lawachara is located in Kamalganj Upazila of Maulvibazar District and one of the major national parks in Bangladesh. In 1997, the Bangladesh government declared it a National Park. The 1,250 Hectares national park is a beautiful tropical forest and is biologically very rich with rivers (Surma and Kushiara) forming fertile floodplains. The park is home to the Khasia tribe which has a forest-based livelihood (USAID Report 2006: 6). In year 2001, a joint survey of US Geological Survey and Petrobangla declared the Chittagong-Tripura folds in Bangladesh to be the most prosperous gas reserve in the country.

The goal of the project was to conserve the protected areas and forests of Bangladesh. It was a public-private partnership project in which state actors, non-state actors and the local community participated on 'co-management approach' (Khan 2008: 12-14). This project coincided with business interests of Chevron (a US based MNC) when a seismic survey was performed by Chevron Corporation in 2008. The MNC carried out exploration within Lawachara National park (Gas reserve in block-14 of Moulvibazar). The survey pushed the Chevron project into a crisis due to its faulty exploration methods, wherein they used explosives other than the 'tremor methods' in the protected forest area. The detonation of explosives violated the Article 23(3) of the Wild Life Preservation Act 1974 (Amended). This law clearly states that exploration is not allowed in reserved and protected areas and forests. Apart from this blatant violation, the survey was also criticized because of its timing, as it was carried out in the breeding season of the wild life habitat (Peng 2011: 5).

Effects of Chevron's Survey in Lawachara National Park

Chevron claimed that utmost priority was given to protecting the biodiversity of the area, but the picture was completely the opposite. Major controversies on Chevron deal were brought to the public knowledge by newspapers, government agencies, NGOs and the locals. Some of the issues are highlighted below:

- Explosions conducted in Lawachara frightened the wildlife causing them to flee the forest. Thousands of Hoolock Gibbons (rare primate species found only in Easter Bangladesh and NE India) died and became a threatened species. They are not seen in the park anymore. During the explosion, gibbons in an attempt to flee died from jumping on to electric wire fencing.

- Explosion-induced tremors caused damage to residential buildings. In addition an accidental fire broke out due to carelessness of the survey crew. Chevron did not acknowledge any of the above allegations (Bangladesh News 2008).

- The activities by Chevron destroyed trees, which ended up impacting the rare flora and fauna of the forest. The claim of Chevron that it operated in 'public interest' is a far cry from reality.

- The forest originally supported indigenous vegetation cover of mixed tropical evergreen forest. However, almost all of the original forest cover were either forcibly removed or substantially altered, thus turning it into a secondary forest (Kabir 2014: 6).

- Explosions set off at nearly 10,000 locations of the park for the survey deeply disturbed the Khasi Punjis living peacefully for centuries in the interiors of Lawachara Park (Gain 2008: 2).

The Role Played by Various Participating Actors in Chevron's Lawachara Controversy

The Lawachara exploration was a public-private partnership project which involved state, non-state, private and public actors such as International Resource Group

(IRG), MoEF, NGOs, BELA, Wildlife Trust of Bangladesh (WTB), Department of Environment (DoE), local community and the Forest Department. Therefore the responsibility of the incident was also to be equally distributed among all of them. The reactions of the participating actors on the incident were as follows:

Ministry of Environment (MoE) & Department of Forests (DoF)

Ministry of Environment (MoE) and Department of Forest (DoF) had clearly indicated in the Bangladesh Wildlife (Preservation) Order, 1973 (President's Order No. 23 of 1973), and amended by the Wildlife (Preservation) (Amendment) Act, 1974 (Act XVII of 1974), that no part of the forest can be cleared for any activity that could disturb the ecosystem. Under this Act, Lawachara is considered a vulnerable forest, which the Government had declared as a protected area (Khan 2013:157). Even fishing or pollution of water bodies in the park is considered an offence.

Diving into the archives of Daily Star (a daily newspaper published from Dhaka), it was found that even after such clear guidelines, the Ministry itself had issued clearance certificate to Chevron, thus allowing it to undertake surveys in the forest during the monsoon season - a breeding/sprouting season of rare species of flora and fauna in the region. The Ministry had also given the Initial Environmental Examination (IEE) and Impact assessments (EIA) status that was required for undertaking the survey (The Weekly Porikroma 2008; The Daily Star 2008). Though nothing was openly admitted by the Ministry officials. They maintained the official line that the accident occurred in spite of all the precautions that were taken by them. Post the meeting, the MoE issued a gazette notification in consultation with Ministry of Law which proved helpful for Chevron's operation under Article 45 of the Wildlife Preservation Act. The MoE Secretary stated that the survey was in the national interest and would not violate the 1974 Act (Khan 2008: 8).

In 2008, in contravention to the Government orders, Chevron proceeded with the conduct of 3D seismic survey. The exploration allowed for park's improvement and beautification and for limited scientific purposes only. (Janice 2007: 17). This was yet another perfect

example of 'pollution havens" mentioned earlier. Though the Ministry claimed that it had made it clear to Chevron to give utmost priority for the preservation of the biodiversity of the protected areas, yet there was no official document found to substantiate the claim. Another blunder committed by MoE was in framing of the objective of the Nishorgo[24] Project so as to suit its convenience. The objective of the Nishorgo project was cleverly framed to read "to reduce the dependency of Khasia tribe (a forest dwelling community) on the forest resources through alternate means of sustaining livelihoods" (International Resources Group 2006: 16). That 'other form of livelihood' implied employing this community in the risky and dangerous jobs of drilling and gas exploration, without any organized formal technical training.

Thus MoEF and DoF were also at fault because it was only with the complicity of the government that this incident ever occurred. MNCs such as Chevron are known to employ devious strategies to enter into an LDC (like Bangladesh) by actually investing far lesser as against the promise made at the time of entering into an agreement in order to make quick profits. This is usually done by entering into secret arrangements with the Government officials using the corporate office route.

Nabhash Chandra Mandal, the Additional Secretary of Bangladesh (BoI) during an interview with the researcher stated that "the foreign companies register themselves with BOI as a branch office and not as a foreign company/industry. Under the umbrella of branch office, these foreign companies commercialize and expand their activities. Chevron is one such company that earned almost $500 million from Bangladesh economy till 2010" (Personal Interview: February 12, 2016). He further added that registering as a branch office provides these foreign companies the benefit of an extended parent company. Otherwise they would have been treated as a separate legal entity. This made the foreign investors business plan easy in Bangladesh in terms of risks and profits.

[24]Nishorgo is a collaborative response network to conserve and restore protected forest areas, critically ecological areas and wetlands in Bangladesh. This work was to be undertaken on the basis of co-management approach between local community, Government and Civil society.

Lastly he stated that they earn profit in the name of the parent company with lower risk as the risk is borne by the host country (Bangladesh), which has easy exit policies.

The best example of this was the selling off of the assets from Occidental to Unocal after Magurchara explosion and leaving the host country Bangladesh without any punitive action on their heads. Similarly Niko had also tried to do so after the Tangratila fire explosion. These kinds of incidents reveal a definite pattern about how freely and casually the foreign investors are operating in Bangladesh with the tacit understanding of the Government in power.

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Role Played by Petrobangla

Petrobangla was established in 1972 as Bangladesh Minerals, Oil and Gas Corporation (BMOGC) under President's Order no. 27 to deal with the gas and mineral resource exploration and development of the country. In 1974, it was reconstituted and named Petrobangla (Petrobangla 2012: 49). Under Bangladesh Petroleum Act (27 August, 1974), Petrobangla's main objective is to supervise and coordinate the activities of international oil companies (IOCs) under the PSC. A visit to Petrobangla was undertaken with an objective of finding out what exactly happened in Lawachara and role of Chevron and Government in the whole process. Few officials from Petrobangla provided details on condition of anonymity.

According to one official, all exploration activities in Bangladesh are based on public sharing contract (PSC). Under this contract, Petrobangla was given the right to enter into agreements with any international oil companies at any time. Amongst the major activities of the company are the administering, supervising and organizing of the PSC. Out of total quantity of exploration, Petrobangla owns 65% while Chevron owns the remaining 35%. The cost of the gas explored depends on the percentage of methane, higher the methane heating value, higher will be the cost and vice versa. The highest cost recovery Chevron (the operator) can take from Petrobangla is 55%.Chevron is performing exploration activities in three gas fields:

- ***Jalalabad gas field***: All the four active gas wells in this field are occupied by Chevron. This field delivers full capacity of 250 MMCFD.[25] Presently, three infill wells are being drilled (from the same pad) that are aimed at increasing or sustaining production to present levels. The condensate capacity of this gas field was recorded at 1600.1 BBL (billion barrels) (Petrobangla Annual Reports 2014: 35).

- ***Maulavibazar gas field:*** There are nine wells out of which six produce 65 MMCFD of gas. The actual total capacity of the installed process plant is estimated at 125 MMCFD. Chevron is working hard to enhance the production or at least sustain the present declining levels of production. Lawachara National Park which is located here had experienced the huge explosion which took place in 2008. This gas field comes under Block 12 and 14 of Petrobangla gas field distribution (Ibid: 35).

- ***Bibiyana gas field:*** This gas field was explored in 2007 under Block 12 by Petrobangla. This field contributes the maximum percentage share to Chevron's national grid, which has the installed capacity of 1,350 MMCFD. Out of total 24 wells, 18 wells produce 1006.7 MMCFD gas and 4,500 BBL/day of condensate. The remaining eight wells came on stream by 2015 which increased the total production to 1,150MMCFD gas and 9,000 BBL of condensate per day. To increase and sustain the future production, both Chevron (operator) and Petrobangla were planning on establishing a compression projects shortly (Ibid: 35).

Initially, the exploration tenure granted was for two years (for research & development) but after discovering the gas reservoir, the contract was extended by two more years for further exploration and was continuously renewed based on more

[25]MMCFD stands for Million Cubic Feet per Day.

discoveries. Under PSC guidelines Chevron cannot directly sell its gas production to the Bangladeshi market. It must sell to Petrobangla only.[26]

Another official revealed that internal disputes between Chevron and Petrobangla were very common on gas and condensate sales. One of the conflicts occurred when Petrobangla rejected Chevron's Jalalabad growth project by saying that Chevron failed to bring any significant progress in gas and oil exploration (The New Nations 2009). In another conflict when Petrobangla rejected the Chevron's request to hike gas prices, the company decided to withdraw its investment of $650 million. While disputes continued, there was no official statement given by Petrobangla regarding their disagreements. The regular extension of the contract was a vindication of the bonhomie shared between the two. During the interview, when asked about the conflict with Chevron after Lawachara incident, the official was tight lipped and clearly said that they were a gas-procuring public company which buys oil and gas from IOCs (International Oil Companies).

Petrobangla gives priority to Chevron because it controls 58% of the Bangladesh oil and gas exploration sites. Outright exit or even upsetting Chevron could end up in fiasco for Bangladesh's oil & gas sector. It was for this reason that Petrobangla played it low in the whole tragic incident pre and post Lawachara explosion, and avoided confronting the company. A senior official (Name kept anonymous) during the interview stated, "IOCs are doing very well in Bangladesh under the supervision of Petrobangla. The Chevron incident was a fault of negligent labour and not that of the Corporation or Petrobangla. Chevron is performing all the exploration activities with full precautions and procedure and that is the reason they are the operator of three largest gas fields in Bangladesh" (Personal Interview, 16 February 2016).

Co-Management Bodies

The local and Bangladesh government gave clearance to Chevron. Chevron runs largely protected operations because it has a major contribution in gas production of

[26] The above information was collected from Production and Marketing Division of Petrobangla by interview and consulting archives.

nearly 70 MMCFD gas per day in Bangladesh. The collaboration of Petrobangla and the Government allows such unhindered explorations. The ruling party was the caretaker Government that had allowed Chevron to perform exploration and relaxed the Bangladesh Wildlife (Preservation) (Amendment) Act 1974 (Gain 2008: 1). The Act of protecting the forest and wildlife was completely violated by Chevron during the operation by securing Government's immunity. Government's stand on the whole issue was perplexing to say the least.

The Government had granted permission to the MNC to carry out risky exploratory operations in violation of its own laws of the land. They then claimed that that they were unaware of the accident till seen in the news media. The Co-Management body was busy in holding elections for the executive members and responded only after the Chevron survey was almost completed. The Co-Management Committee (CMC) wrote a letter to Chevron asking it to furnish a report giving out the facts leading to the accident, which kick-started the blame-game with neither sides backing down. One of the main reasons for CMC's unclear position on the issue was the 2008 election through which they were planning to elect their own 19 executive members. The local government (part of co-management body) became proactive after the instructions of Deputy Commissioner and formed a 5 member committee to evaluate the damage caused to Khasia village due to explosion. The report provided by the committee after investigation formed the basis for the Deputy Commissioner of Moulvibazar district to allow Chevron to resume its seismic survey in April 2008.[27]

Chevron Corporation

Chevron did not take any official position at the time of the incident. According to the initial report in the newspapers, Chevron stated that there was only superficial damage to the ground and trees because of the fire. The company also claimed that the fire had not impacted the wildlife. The stark contrast between Chevron's responses in a developed country as against a developing country could be seen in a similar incident that took place in 2011 at Chevron's Pembroke, West Wales refinery which had shattered and

[27] The letter was issued on 30 April 2008; Vide No. jaypromou /L.A-56(ongsho-1)/2008/191.

damaged a 730 cubic meter storage tank. At that time a team from Chevron, USA, flew to Pembroke for investigation, while in the case of the Bangladesh explosion such sense of responsibility was clearly absent (Daily Mail, 4 June 2011).

In an interview given to Bangladesh News in 2008 immediately after the explosion by Steve Wilson (chief executive of Chevron), it was said that before conducting any survey the company ensures all the necessary measures to protect the environment. Not surprisingly, he completely denied the relation between Chevron's seismic activities and the fire. Chevron authorities after the incident down played the effects on forest and wildlife. When there were many rounds of complaints about the explosion and cracks in the houses; the explosions were stopped for only one day in Daluchhara village and Kamalgaj (Gain 2009: 133). There was no official statement on Lawachara incident. It can be inferred that the reason for such irresponsible attitude was made possible as a result of the covert protection from the Bangladesh government and the Co-management body. Bangladesh's overwhelming compulsions to attract FDI to boost economic growth could be driving the government to turn a blind eye to their laws and regulations, resulting in a display of indifference by the foreign investors.

In an interview of a senior Chevron official with this author (name withheld for anonymity), it emerged that internally, Chevron was afraid of being on the back foot but brazenly stood its ground repeating that "Chevron is a responsible Corporate which knows its duties and responsibilities". The official claimed that the incident of Lawachara was unfortunate and was an employee's mistake. The company had "initiated an inquiry to find out the real cause". When asked for the report of the enquiry held by Chevron a repetitive answer of confidentiality was given, ignoring the fact it was a right of the victims and Government to get compensation and reasons of the incident.[28]

The work resumed at normal pace immediately after the CMC gave green signal to Chevron. A team of SEHD was present in the park at the time of drilling and reported that Chevron team had drilled to set up explosive up to 40 meters in the forest and 70

[28] In a personal interview with the researcher on 16 February 2016, Chevron Corporation, Dhaka.

meters deep into the ground by using noisy generators and cutting trees (Gain 2008: 2). As a 'reward' for the accident, Bangladesh Government gave more projects to Chevron after the 3D survey was successfully completed. In 2012 new wells were drilled and production started. By 2015, six wells were producing gas from the Moulvibazar gas field. The incident of 2008 had not affected the functioning of Chevron in any manner whatsoever. If anything, it expanded its operations at rapid pace not only in Maulavibazar (Lawachara) but in Jalalabad (seven wells by 2015) and Bibiyana (25 producing wells). New investment decision was made for a Muchai compressor station in 2010. During 2009-12, the Bibiyana gas field was expanded to the largest foreign investment in the history of Bangladesh (Chevron Corporation 2014: 1).

Such an expansion by Chevron clearly showed that despite the heavy damage inflicted upon the host nation on the socio-environmental fabric of Bangladesh, the foreign company could get away unscathed. To keep the workers of the company and the Bangladesh Government humoured, Chevron recently undertook variety of Corporate Social Responsibility (CSR) initiatives. It created a Centre for Natural Resource Studies (CNRS) and launched two years training program for the youths of the Jalalabad gas field, activities for community motivation and mobilization. With other program such as alternative livelihood program (ALO), Chevron aims to secure the financial future of its beneficiaries, "Bandhu Chula" introduced under village development organizations. Such programs benefit around 10,000 families in Chevron's gas field area. CSR activities that have been undertaken by Chevron are a direct result of the newly introduced mandate by the Government and not because of any change of heart, as revealed by an official from Bangladesh (Annual Booklet Chevron Corporation, 2014: 1).

Role Played by the Non-Governmental Organizations

International Union for Conservation of Nature (IUCN)

IUCN, which works in the field of nature conservation and sustainability assessment, also submitted a report that was surprisingly not different from Chevron. Rather than hold the Bangladesh government responsible for allowing Chevron to carry out the seismic survey in the first place, the monitoring team from IUCN stated that the seismic survey led by Chevron had caused no harm to the protected forest. In addition to

that they believed that “This kind of monitoring is meaningless”. Those monitoring and giving positive certificate to company should be backed off and the seismic survey in the protected area should be suspended right away.

IUCN on the one side stated about the suspension of the Chevron’s activities while on the other called Chevron a non-harmful company for environment and blamed Bangladesh Government for conduction of such survey in breeding season (Khan 2008:10).The Zoologist in the blasting team of IUCN declared that he had not noticed any disturbances to the wildlife at all due to blasting (Gain 2009:134).Besides this, IUCN and Chevron also happen to work together on multiple projects around the world. To further taint the reports validity, it was found that not only has the US State Department given annual voluntary contribution for Nishorgo, the monitoring cost for the survey site was also covered by Chevron.

The Bangladesh Environmental Lawyers Association (BELA)

BELA is a legal NGO (Non-Governmental Organization) that focuses on protecting the environment in Bangladesh. BELA was amongst the organizations that allowed Chevron to perform survey by relaxing the wildlife Act. The perception of BELA towards the incident shows that it favoured Chevron. Immediately after the explosion, BELA along with the organizations like IUCN and Wildlife Trust of Bangladesh (WTB) actively opposed and organized several street protests such as human chains against the survey.

Among the NGOs protesting against Chevron, BELA was the leader. Later, it showed a lack of will to fight against Chevron and shifted the blame and attention on the Bangladeshi government for allowing companies such as Chevron to exploit the environment. Chief Executive of BELA, Ms Rizwana in interview with this author said “Chevron is not as dangerous for Bangladesh economy as other IOCs like Niko. Chevron is just a brand name that comes to mind each time an incident like this occurs”. According to her, Chevron does not damage the environment and community as much as the other IOCs, which are carrying out exploration activities at one or two wells. In a

recorded interview on 15 June 2008 to Mohammad Tanzimuddin Khan, Rizwana Hasan (Director and Lawyer) said "If BELA loses the case in the court, it would give Chevron a legal ground for conducting the survey" (Khan 2008: 18). Hence BELA backed out from the controversy but seemed to favor Chevron while saying other IOCs are more harmful. This is found to be quite self-contradictory behaviour on the part of BELA.

Researchers, Academicians and News Papers Reports

Anu Mohammad[29]

In an exclusive interview with this author, Anu Mohd[9], a Bangladeshi economist and activist stated "The contract with Chevron allows them to make huge profit at the cost of Bangladesh economy. Bangladesh purchases gas from the company at a price that is about 10 times higher than the price offered by national companies. Therefore the country has to pay subsidies on Chevron's gas that creates pressure to increase gas price for the consumer". This meant that Chevron was a company that had created dominance in the market, which further affected the other Bangladeshi gas and oil companies. This dominance of foreign company was possible because of their better and modern exploration techniques and machineries which the Bangladeshi companies were lacking. He further added ""compensation for Magurchara blowout is still unrealized. Chevron has been a very bad presence for Lawachara. Nishorgo project is in different ways actually rationalizing Chevron's harmful operations in ecologically sensitive area".

The blowouts of Magurchara, Lawachara are examples of insensitive and casual attitude of MNCs towards the environment, society and economy as they extract resources to the fullest and leaving the country empty. In an interview to Dhaka Tribune on 15 June 2013, Anu Mohammad said the MNCs such as "Chevron and Niko should pay the country Taka 45 billion as compensation for damaging gas resources at Magurchara and Tengratila gas fields". The damages caused by these MNCs is huge and has long term irreversible effects hence the compensation should also be imposed accordingly and should be made sure that they pay to the Government.

[29] He is a Bangladeshi economist and political activist. He is also member secretary of the national committee to protect Mineral resources, oil, gas and ports.

Anu Mohammad in an interview with Philip Gain gave an interpretation on gas and mineral sector issues in Bangladesh: "The multinational companies want to take full control of the energy resources of Bangladesh. They spend a good sum to have some influential environmental organizations and some influential journalists on their side. They don't do research for monitoring and reporting. The companies use them to solicit legality. (Daily Star, 24 May 2008). This line of thought that MNCs such as Chevron want to capture the gas sector through bribing of the political parties, media and NGOs in order to ensure profitable operations is substantiated through other literature as well.

Mohammad Tanzimuddin Khan[30]

He has done extensive work on Nishorgo project and has found some interesting and shocking facts about Chevron Corporation in his thesis. According to Khan, the Nishorgo (Chevron) forest conservation project that had used a co-management approach was not effective as it led to a survey which had a major negative outfall. The organizations and civil societies that were involved in the project (IUCN, BELA, IRG and many more) had the objective of conserving forests. Further, Khan believed, that the government should understand complexity of such projects and deal with accountability, transparency and participation. The focus should be given to political-economic interests not on the public-private partnerships as they can lead to a negative impact, as observed in the case of Chevron (Khan 2014: 74-75). While talking to him personally on the Chevron controversy in Bangladesh it was found that politics and corruption of Bangladesh is giving space to such foreign investments to flourish. The government has a very narrow, short-term outlook and gets huge profit from such foreign projects. Thus its policies and decisions in the business interest of Chevron like foreign companies. He further added that various agencies such as IUCN, IRG and USAID working for environment have also proven to be ineffective and this has exposed the conflict between nature/forest conservation and capitalist profitability in the country. In the interview, he stated that the 2008 incident has opened up a "Pandora's box"[31] as this has questioned the

[30] He was a researcher from University of New England, Australia and Professor of International Relations in University of Dhaka, Dhaka. He has done intensive work on Nishorgo project, Chevron Corporation in Bangladesh.

[31] Pandora Box is a situation or process which generates complicated problems and is caused by unwise interference in a situation. Here, Chevron is referred to as the problem.

accountability and transparency of institutional or governance framework and other participating actors (Ibid: 75).

***M. M. Akash*[32]**

He claimed that "these foreign investors affect the environment and energy sector negatively in three ways: generating profit for them, exploiting environment and reducing the domestic capacity building". Specifically speaking in context of foreign investments such as Chevron – he believes that these foreign firms are exploiting the natural resources of Bangladesh and earning huge profits out of that. The exploitative nature of gas and oil exploration by these MNCs has negatively affected the national companies operating in this field.

This process of prioritizing foreign companies impedes the potential of domestic companies, that have the potential but due to market dominance of Chevron, Niko, and Unocal etc they are unable to fully blossom. He further added that "local/domestic investors should own the high potential gas fields, while the marginalized and less potential gas fields should be given to foreign investors. This will give priority to national interests" (Personal Interview: 18 February 2016). He further added that "the net inflow of FDI should be checked through ownership structure and relationship between local and foreign investment". In Bangladesh, major gas fields are occupied by the foreign investors, which leave's no scope for Bangladeshi companies to compete. This results to in a win-win situation for companies such as Chevron which is not good for the host economy in long run.[33]

The Daily Star

The Daily star is one of the leading newspapers of Bangladesh which played a crucial role in reporting Chevron's Lawachara explosion. On 22 February 2008, Daily Star and a weekly called Porikroma first informed the public about the incident. *Daily Star has covered each and every aspect of the incident by interviewing, reporting and*

[32]He is a Professor of Economics in Department of Economics, Dhaka University.
[33] In a personal interview with the author on 18 February 2016, University of Dhaka, Dhaka, Bangladesh.

*publishing it. T*his is exemplified through the fact that Sylhet's DoF and the Wildlife Management & Nature Preservation Department were informed through the newspapers publications.

It published a report stating that Petrobangla's extreme reliance on foreign investment by giving major chunk of gas distribution system to Chevron is a matter of serious legal complications over the authority, ownership of the compressor station and the distribution pipeline. This has created a precarious situation for the national exchequer already. This has increased the cost structure with the profit going majorly into the bank accounts of the foreign companies. This is not a sign of healthy growth for national companies. The post incident situation was more difficult as no one was telling the truth and denied the allegation of Chevron being an agent of destroying the forests even though the Lawachara natural forest is vanishing fast and is not the same as it used to be. Government, Chevron, IUCN, and many more denied the negative effects of Chevron explosion (The Daily Star, 4 May 2008).Similar to the above expose, the Daily Star has critically covered Chevron's activities and performance in Bangladesh that has brought to limelight the irresponsible attitude of Chevron in the 2008 explosion.

IV.5 Finding of Field Trip of GlaxoSmithKline (GSK) Pharmaceuticals, India

Background of Pharmaceuticals Sector in India

The pharma market in India is the third biggest in terms of volume and thirteenth biggest in terms of value. In 1991, when India adopted the policy of liberalization, FDI began to flow 100% to many sectors except Pharmaceuticals due to which the industry became highly fragmented. The main source of this fragmentation was the Intellectual property rights (IPR) debate between branded pharmaceutical companies and generic pharmaceutical companies of developing and developed countries. Initially, India was not keen on granting IPR protection however over a period of time the importance of IPR in long run has been realized. In 2005 an amendment being enacted and the department of pharmaceutical was created in 2008 with a vision to make India the largest global market of medicine at reasonable prices (Business Standard, 2014).

In December 2014, the Indian Government & the Department of Industrial Policy and Promotion (DIPP) permitted 100% FDI under automatic route, without being subject to any additional conditions including the condition of non-compete clause (The Hindu, January 08, 2014). This change has helped India obtain global prominence and expansion in the pharmaceuticals sector. FDI was also allowed in the medical devices manufacturing as well. In March 2014, US Food and Drug Administration (FDA) registered 523 Indian pharmaceutical manufacturing facilities. This was the highest for any country outside USA.

With the aim to make India a global leader in drugs discovery and innovation, Department of Pharmaceuticals prepared "Pharma Vision 2020". Through this vision, the government provides various benefits such as funds for research in the private and public domain, infrastructure and scientific manpower (India Brand Equity Foundation 2015: 1). The major players in Indian pharmaceutical market are Novartis, Abott India, Pfizer, Aventis, Astra Zeneca and GSK. With increasing foreign investment in India it is expected that from 2015 to 2020, the Indian pharma industry will grow at 15% per annum and by 2020, it will reach to more the $1.3 trillion (National Investment Promotion Agency 2012: 1). This will account for nearly $1/5^{th}$of the pharmaceutical sales globally. According to FICCI (2008) report, during 2009-10, clinical drug trials have generated $1 billion business.

This following part of the chapter is about the case study on one of the leading and FDI attracting sectors of Indian economy. Seeing steady growth of Pharma sector in India, it was vital to assess the trend, growth prospects and future trend of one of the leading health care research company. Hence an effort was made to know the impact of GSK on society, institutions and environment, the findings are given below.

GlaxoSmithKline in India

GSK is a British multinational company established in 2000 by the merger of Glaxo Wellcome and SmithKline Beecham. In 2014, GSK was announced as the world's sixth largest pharmaceutical company. In 2015, the company was listed in London stock exchange with a £73 billion market capital (Forbes 2016: 1). In 1924, GSK started its

investment in India and became one of the leaders in pharmaceuticals and health care industry. One of the most interesting aspects of its mission is to operate responsibly for society.[34] India has a strict patent laws and regulations (Intellectual property laws) to protect it from "ever-greening" (the process by which a company tries to patent incremental innovations to a product in order to extend its protection) (The Economist, 6 August 2013). Still there are many controversies attached with GSK regarding patents, its stake in the Indian subsidiary, its impact on environment, drug trials, and cancer vaccine trials etc.

GSK Drug Trial Controversy

Like other foreign investments, GSK was also not able to stay away from controversies. There are many controversies attached with the company. The first and foremost controversy began when India eased its guideline for conducting drug trials in 2005. Before 2005 January, the new drugs clinical trials were being developed abroad not in India. India became second preferred destination after China for drug trials. In India, clinical trials are regulated under Drugs and Cosmetics Rule (Schedule Y) of Drug Controller General of India (DCGI). The monitoring of clinical trials is the responsibility of DCGI and companies submit here for drug trials approval. During the trial the ethical guidelines developed by ICMR needs to be followed during trials (ICMR 2000: 4). The Government of India has provided various incentives to the pharmaceutical companies like no import duty, exporting specimen of clinical trials results and exemption in sales tax. The Restrictions set up the DCGI are mandatory registration, inspection of trial sites and keeping record of participants along with their fingerprints to avoid more than one trial on one (CSER 2009:16).

The clinical drug trials has benefited India a lot by giving well tested drugs for cancer, heart attack, HIV etc, gives better medicines, cheap prices, opens medical labs and diagnostic centers and create job opportunities for new medical graduates. When the proper guidelines are followed the drug trial can prove to be beneficial and but often

[34] An official from GSK spoke about strategy and planning to the author.

these trials end up exploiting the vulnerable and poor population of India (Mondal and Abrol 2015: 12).

Statistics shows that since 2005, the pharmaceutical industry has involved 150,000 people in at least 1600 clinical trials. From 2007 to 2010, around 1,730 people have died due to these trials (The Independent, 30 September 2013). International pharma companies such as GSK, Novartis took advantage of the low cost treatment for the chronic diseases like Cancer, Alzheimer's etc. These companies' claims that appropriate guidelines are followed during trials but the number of cases recorded of death and illness during these trials clearly depict that the lack of oversight is one of the main reason of such abuse. Other reasons noticed for the mishaps because of drugs trials are as follows:

- Patients in their ignorance gave consents to free trials without understanding the risks and proper process.
- Poverty and illiteracy are other reasons that have encouraged such trials.
- Drug trial is commonly seen on people from city slums, tribal communities or poor economic backgrounds. For example, 11 cases of drug trial were recorded on the Bhopal gas tragedy victims including trials on young tribal girls without their parents' consent. Bill and Melinda Gates Foundation recruited these girls for cervarix immunizations and ended up doing trials in private clinics.
- A lax regulation for medical trials by the Government has given a rapid rise to cases.
- India has diversity in size and genetic of the population along with the different variety of conditions to treat (Ibid: 12).
- The size of the population (1.3 billion in 2015) allows for a huge number of patients and genetic diversity of illness, which leads to the huge number of clinical trial participants.
- The lack of understanding of the drug trial process and its possible ramifications encourages renowned pharma companies to conduct more drug trials in India (Lakshmi 2012: 2).

This laxity in trials came in notice when many cases of illness and deaths were recorded during the trial of cervical cancer vaccine (Cervarix) manufactured by GSK (Under PATH[35] project). The lawyers and civil society campaigners took the matter to Supreme Court where the matter was taken under a serious consideration. Looking deeper into the matter Supreme Court demanded Government to answer within a month about the causes of these illegal drug trials and to take strong action against the pharma companies. GSK was ordered to response to the allegation, which the company did not respond to. The Supreme Court also asked government to make efforts to get the consent from those who have participated in the trials to know the exact situation of health consequences of the girls on whom trials have been done (Chamberlain: 2 April 2015). The bench headed by Justice Dipak Misra stated that error in trials is the failure of Government when the health of people needs to be preserved.

The clinical trial was a clear cut violation of human rights and child abuse as trials were performed on adolescent girls without their parent's consents. The NGOs and campaigners raised their voices and claimed it was an illegal trial that was conducted without informing the parents of the tribal girls. The two names that were involved in this were GSK and Bill and Melinda Gates foundation for funding the trial. The civil society groups, Judges of Supreme court and the people demanded strict action against the involved companies namely GSK. The latter stated that "clinical trials are governed by strict regulations. Throughout each trial the proceedings are monitored by government authorities as well as GSK's own Global Safety Board (GSB)". In the GSK drug trial objectives it is clearly stated that phase 1 of the trial performed on a small group of healthy volunteers and only on humans, the safety issues of new medicines are kept in mind and deliver benefits then only the trial is proceeded to next phase (GSK 2016: Clinical Trial Phases).

GSKs phase 1 itself has violated the laws and regulations and noted by Government as many of the patients died or became ill. This should have prohibited the company from

[35] PATH is a USA based group which organized the emphasis on the study. The study reveals that vaccines which were used in trials were safe and these vaccinations are in the interest of public health.

conducting any further trials as per its own rule and Government rules. Thus GSK should have not moved to the next phase. Since GSK went ahead with the Phase 2 trials, the end result was that more health issues were noticed in Madhya Pradesh and victims came out complaining. GSK felt they can get away with any negative effects and that the trial patients knew of only the benefits, leaving out the side effects. In an interview with BBC, the blame game started immediately when GSK blames Sanofi (French Company) for carrying out the trials while GSK only bought the rights to drug. Sanfoi further blamed Quintiles (Indian Research Organisation) for conducting the trial (BBC, 1 November 2012).

The preliminary committee report has been submitted and stated that "Under the pretext of an observation/demonstration project a clinical trial has been performed". This has violated the laws and regulations of Government. Court has ordered both Merck and GSK to respond to the allegation and in return both have denied any wrong doing. They called the preliminary report an inaccurate characterization of their important work on cancer. GSK was involved in another drug controversy in 2007. This was called the "Tide trial" and the drug used in the trial was found to damage the heart. Indian Government took a strict action against GSK and ordered it to suspend 19 drugs trials in India in 2010. As a consequence of this many patent claims also suffered. Food and drug Administration (FDA) gave clear instruction to GSK to stop controversial trials and inform all 1,300 people who are involved about the risk (Heart attack risk) because of medicine "Avandia" (Gautam 2012: 114).According to the Government's Drug Regulatory Agency in 2012, compensation was given by the U.S. and the European drug companies to the 22 families who suffered ill-effects of the trials (Lakshmi 2011: 2).

When asked about this allegation during the authors visit to GSK, a senior official in the Delhi region (name kept anonymous) completely denied it by saying "there was no direct allegation on the company regarding the matter, being an old and loyal company in India GSK always has been a strict follower of government laws". The official mentioned that the research and development activities performed by GSK are under the drafted guidelines of Government. When the author sought inputs on the compensation paid, she was told that the compensation norms were strict and duly followed by the organization. .

"In case of drug trial of Cervarix vaccine, volunteers were given compensation. In defence of GSK, he stated that the trial was not performed by GSK but rather by Sanofi" (Personal Interview, 14 Feb 2016). The official went on to explain that GSK has been in Indian market from more than 90 years and that its exemplary historical performance has been its source of continued existence in the market. He added that considering the huge potential for growth of pharmaceuticals in India GSK was not likely to make mistakes that could harm the company's prospects.

The official further stated that "the objective of the trial was to provide life-saving safe vaccine to deprived low-income girls in India under immunization program. The incident which took place was unfortunate. As GSK was involved in the drug trial controversy it was punished by the Supreme Court and Government of India. Facing strict action, GSK promised to remain committed and came back to Indian pharmaceutical market after facing short period of turbulence. Seeing the long-term growth potential of the economy, GSK was not like to play any dirty tricks again. Moreover, it was afraid of its other MNC competitors who were threatening to steal a larger share in the Indian Pharma market. Ever since the trial disputes with MNCs, the Government of India also became alert and framed stricter pharmaceutical laws and regulations for foreign investors in this field with restrictions like patent restrictions and price control (Ahmed: 5 September 2012). This stands in contrast to the observations from Bangladesh (Chevron, Niko) where the companies that violated the law and negatively impacted the host were allowed to operate in the host country with impunity.

GSK and Environment

The MoE of India has classified pharmaceutical sector in the "Red Category" because of its hazardous waste releases. The companies operating in this sector are accused of deteriorating the environment in India (Bruni 2016: 15). In the Indian pharmaceutical market, 35% players are foreign firms as of 2017 (In 2009 the share was 28%) and the key players are GlaxoSmithKline, Pfizer and Abbott Laboratories (Ibid: 12). Such a substantial share in the Indian market puts the responsibilities on these companies to bring in environment friendly production techniques. Foreign firms such as GSK are

incentivised to adopt environment friendly techniques because it sees the long term benefits of operating in the Indian market whose increasing population is creating a greater demand for medicines. Towards that end the 13 big pharma firms (like Allergan, Cipla, johnsons, Pfizer etc) including GSK have taken steps to clean up their antibiotic waste discharge by reviewing and upgrading their manufacturing and supply chain standards (Taylor, 9 October 2016). Furthermore, GSK also ensures that the products or compounds which they use are environment friendly. It performs environment risk assessment to meet the regulatory requirements for its new consumer healthcare products. GSK has taken steps to ensure safe discharge around the manufacturing sites and has committed to minimizing the antibiotic discharge by 2020 (GSK Communications and Government Affairs, 2016: 1). GSK also replaced the current technique of packaging to a new one which uses expanded polystyrene (EPS). The EPS is a shipping container made up with paper honeycomb and considered as an environment friendly material, recyclable and help in reducing the carbon footprints (Narendra, 2016-17: 1).

The Indian pharmaceuticals industries are mostly spread throughout the country but Andhra Pradesh (Hyderabad and Vishakhapatnam) has emerged as the hub for bulk drug manufacturing. Hyderabad which is considered as a drug capital of India (accounts 1/5th of India's pharmaceuticals exports) is a hub for many drug manufacturing companies. It is also facing severe environmental pollution because of the persistent discharge of effluents. This has created an outrage among the locals who actively protest the presence of pollution causing pharma companies. A key observation from is the fact that the majority of the pharma companies located in the Andhra Pradesh cluster are Indian pharmaceuticals such as Aurobindo, Dr Reddy's, Hetero Drugs Ltd etc (Bruni 2016, 16-17). It can thus be inferred that foreign companies are less pollution intensive as compared to domestic pharmaceutical firms. The reason for this could be that either the government has stringent laws for foreign players or that the foreign companies such as GSK operate in a more environment friendly manner as shown in the previous paragraph.

GSK's Social Responsibilities

GSK is an old foreign company operating in India and it has fulfilled its social responsibilities from time to time as part of its corporate agenda. It has been involved in various social and economic programs in India in keeping with its stated mission policy "to improve quality of life by enabling people to live more, feel better and do more" (GSK Official Site: 2016). In 2016, Business World ranked GSK the second most respected pharmaceutical company in India. Fortune India called it the "most admired" (GSK Annual Report, 31 December 2016). Some of the social responsibilities activities undertaken by GSK in India are:

- GSK has committed to eliminating Lymphatic Filariasi (known as elephant-foot) from India. In India it has been recorded that 250 districts and around 600 million people are at risks. In 2015-16, GSK donated over 70 million Albendazole tablets to the World Health Organization (WHO) which partners with the Government of India to administer the medicine (GSK Annual Report 2016: 9).

- Partnering with local NGOs called Action Research and Training for Health (ARTH) in Rajasthan and CARE India in Madhya Pradesh, GSK uses trained community workers to generate awareness to improve 'home-based newborn care' to mitigate newborn deaths in India. 27% of the world's newborn deaths have been recorded in India, which is highest in the world.

- A school of sanitation has been set up in Nasik. Disaster relief efforts were carried out in Mumbai in partnership with St. Jude India Child-care Centers. It also undertakes skill development program for its employees (Ibid: 11).

- Donate medicines wherever needed and provide humanitarian assistance as well.

- Considering the impact of discharge of pharmaceuticals residues on the environment GSK has committed to ensuring that its products would not be affect the people and environment including lakes, ponds and rivers. The spelt out

policy is meant to ensure that it conducts its business in an environmentally and socially responsible manner (GSK Report 2012: 11).

- The GSK has shifted its technology to batch production, allowing for smaller facilities with lower operating expenses. This process generates less waste and causes less environmental impact (Lo Chris: 14 March 2016).

Therefore, the studies conducted on both the countries prove that bad policies and corrupt governing institutions can turn a country's resources from a blessing into a curse. FDI as an economic development lever has the capacity to exploit host country's resource where there is systemic corruption, political instability and internal conflict. Corruption, poverty, inequality, and repression go hand in hand with exploitation of natural resources which FDI is able to do because of its intrinsic nature or vice-versa. A comparative analysis (Chapter V) between the two countries will make the picture clearer regarding policies and adoption.

CHAPTER V

FDI AND ENVIRONMENT IN INDIA AND BANGLADESH: A COMPARATIVE ANALYSIS

V.1 Introduction

The important role that FDI plays in the Indian and Bangladeshi economy can be discerned through its contribution in economic growth and international trade. India and Bangladesh both consider FDI as a critical development variable in the current global context, and thus both the economies have adopted economic reforms in a comprehensive manner. This has resulted in huge inflows of capital and investments. In the South Asian region, both have an economic advantage because of their uniqueness in terms of geography, politics, population, growth, and development and policy frameworks.

India has a hegemonic image in South Asia. On the one hand it is able to make its presence felt as seen in the economic assistance provided to neighboring countries, and also playing a critical role in Bangladesh's liberation war of 1971; on the other hand it has made military intervention in the ethnic Crisis of Sri Lanka in 1987 and in the attempted military coup in Maldives in 1988 (Bhasin 2014: 11). Bangladesh has an advantage in its geographical location (between South and South-East Asia), which provides it with a great opportunity for benefiting from investment flows and cross border movement of goods and services (Rahman, et.al 2014: 4). Other countries like Nepal and Bhutan are at a relative disadvantage.

Many questions could be asked on various aspects of economic reforms and their impact on the economies and environment of Bangladesh and India. These questions could range from the very nature and timeline to the depth and scale of economic reforms in these two countries. For instance one could really trigger debate on various aspects of regulatory measures in Bangladesh and India vis-à-vis FDI and how these measures encouraged or discouraged the FDIs to violate the environmental norms and practices in areas where they were allowed to participate? Hence, this chapter is an attempt to conduct a comparative analysis between India and Bangladesh on the basis of quantitative and qualitative analysis and findings in the field studies.

V.2 Why is a Comparative Study between India and Bangladesh Important?

This thesis makes an attempt to analyze economic reforms and the FDI inflows in India and Bangladesh. It will highlight the similarities and areas of contention. Both these countries have cultural, political, civilization and social links and commonalities. It was a single country where today's Bangladesh was East Bengal region within India prior to partition in 1947. During the liberation war in 1971 in East Pakistan, India not only effectively participated to support East Pakistan emerge as nation but also absorbed huge after-war shocks including millions of refugees from East Pakistan (Praval 2012: 8). Since then India and Bangladesh have developed political and cultural ties. The similarities between the two are also observed in other aspects – both are agrarian economies, have natural resource base, huge workforce, densely populated, and have ethnic and religious similarities (Bengali's and Muslims). Apart from being close strategic and trading partners they have worked together on energy and development cooperation. The main areas of disagreement relate to the water dispute on the Ganges and Teesta and also the influx of Bangladeshi nationals into India in an illegal manner. Border disputes such as trafficking, smuggling, killing of civilians, illegal immigrants, terrorist activities are also a major source of contention (Rahman 2006: 197).

This chapter focusing on a comparative study is divided into four sections:

i) Comparative analysis of FDI inflows trends, composition and directions.
ii) Comparative study based on an empirical analysis.
iii) Case studies undertaken in these two countries are compared
iv) Comparative analysis of environmental laws and regulations related to FDI participation

V. 3 Trends, Compositions and Directions of FDI

The trends, compositions and directions of FDI were analyzed in chapter I of the thesis individually for India and Bangladesh. Therefore, this part of the chapter deals with the comparative analysis between India and Bangladesh. The table below (Table V.1)

gives a summary view of the FDI trends in both the economies along with the composition and direction of FDI.

Table V.1: Trends, Compositions and Directions of FDI at a Glance

	India (In Million US$)			Bangladesh (In Million US$)		
Total FDI Inflows	**1991**	**2001**	**2014**	**1996**	**2001**	**2014**
	167	4,222	16,054	366.85	393.76	1181.44
Composition of FDI (Top 5 Sectors)	**1991-2014**			**1996-2014**		
	Services			Telecommunication, Transport and Storage		
	Electrical Equipment			Fuel (Power + Gas + Oil)		
	Telecommunication			Textile and Wearing		
	Chemicals			Banking		
	Fuel (Power+ Oil+ Gas)			Manufacturing		
Direction of India (Top 5 Sectors)	**1991-2014**			**1996-2014**		
	Mauritius			United Kingdom		
	United States of America			United States of America		
	United Kingdom			Egypt		
	Japan			South Korea		
	Netherlands			Netherlands		

V. 3(i) Comparative Analysis on the basis of Trends of FDI

In India, the policy of economic reform has been a gradual process since independence. It injected reforms gradually through agriculture reforms, industrial reforms, economic planning, and external sector liberalization. A major thrust was provided with the announcement of LPG policy (Liberalization, Privatization and Globalization) in 1991. This helped the Indian economy to open up to new ideas, technology, trade, and exchange and moved India away from operating in isolation. However it also had a backdrop of huge financial and economic crisis in India in the very beginning of 1990s. It opened up various sectors such as energy, retail, pharmaceuticals, and chemicals. It was unlike prior to 1980 when the economy recorded low international trade, high tariffs and a very tightly controlled capital account. The restrictive FDI policies resulted in only 167 Million US$ in 1991-92 and as it eased it recorded a quantum jump to $16.05 billion in 2013-14. The reasons for such a hike in FDI inflows are the number of encouraging incentives to foreign investors such as reduction in trade barriers and tariffs, opening up capital accounts, lowering of exchange rate system,

liberal norms in technology transfers etc. (Raju 2010: 115). India was able to sustain and thrive in the international market and become one of the most popular investment destinations for developed countries. It took notable steps to encourage foreign investments, improved significantly in the financial sector, developed large industrial base and possessed huge mass of educated workforce (Jha 2013: 4).

The obstacles faced by the Indian economy have been mainly policy related and self-imposed restrictions such as lack of export processing zones, high corporate tax , stringent labour laws and restricted FDI in arms and ammunitions, railways, coal and iron mining, lottery, gambling and agriculture. The other sectors such as manufacturing of cigars and cigarettes, chit funds, gambling, atomic energy sector and railways, housing and real estate remained prohibited to foreign investors.[36] In 2015 the government opened up its retail sector, which allowed Walmart and Tesco to enter the territory and compete with domestic retailers such as Big Bazaar, V-Mart, food basics etc (Vyas 2015: 7). The challenges faced by India are also common to Bangladesh. However, as listed below, Bangladesh has a chain of problems specific to it, which has lowered its FDI attractiveness (corruption, political instability, poor infrastructure and institutional challenges) as compared to India.

Bangladesh, got independence in 1971 from Pakistan and as a newly independent country, it received its first FDI inflows in 1973 with a small stock. To achieve its socio-economic objectives (higher saving rates, better economic growth and poverty reduction) after coming out of the shackles of Pakistan and to survive in the world of economic competition, Bangladesh focused on the foreign investment (Rayhan 2009: 10). The continuous increase in the flows of FDI which began in mid-seventies was recorded at 366.85 Million US$ in 1997-98 and at 1.18 Billion US$ in 2013-14. An absolute comparison of the amount of FDI inflows between India and Bangladesh shows that the quantum of FDI inflows in India is much higher than in Bangladesh since the adoption of economic reforms. There are many reasons for such a huge difference, these include:

[36] Referred from Reserve Bank of India (2015), Annex-2, Part-1, Section-1, Para 7(c) (iii).

- Bangladesh got independence in 1971, quite some time after that of India in 1947. This impacted upon the growth and development of the Bangladesh economy as it started much later. Hence the amount of FDI, trade, profit, revenue and GDP are lower as compared to India.

- Political disturbances are another reason of the low FDI inflows in Bangladesh. Disturbances such as constant change of government, corruption), terrorism, absence of transparency in government system, irregularity in processing papers, overlapping administrative procedures, institutional backwardness and bureaucratic interference are major impediments to investing and thus discourage investment (Nasrin 2010: 15).

- Poor infrastructure facilities in Bangladesh added to the list of challenges for foreign investments. Unreliable energy supply, congested ports and custom restrictions, lack of skilled labour at different levels of production and high transport costs are also part of the day to day challenges for investors that lead to the lower level of FDI in Bangladesh.

- Another obstacle to rapid flows of FDI in Bangladesh are the institutional challenges such as weak administrative laws and regulations, inadequate financing system, weak standards, weak stakeholder ownership etc. A challenge commonly faced is unexpected delays in strategic, procedural and routine duties by civil courts to settle industrial disputes. No separate court for trade dispute settlement is available for quick decisions. Outdated Companies Act, Inadequate intellectual property rights protection, VAT and Income Tax Ordinance further hamper FDI investment (The Daily Star 2012).

- FDI policies of Bangladesh are not as attractive compared to India's. For example local financing costs are very high and banking delays are frequent. Further, there are many restrictions on current account convertibility (such as overseas legal

fees, technical assistance fees, salaries of expatriates) and fiscal benefits that are not export oriented for investor's (Hossain 2015: 7).

V. 3 (ii) Comparative Analysis on the basis of Compositions of FDI

Another important part of FDI trends is the composition of FDI from 1991 to 2014. Comparing the compositions of foreign investments, it is seen that India and Bangladesh both have competitive advantages in different sectors.

India has received maximum investments in the services sector. This sector is made up of all analysis, technology R&D, banking, financial, insurance, outsourcing and non-financial/business services. The sector has recorded higher growth because India has a huge English speaking and educated skilled labour force. Service providers such as Vistra groups (a professional service provider), Amazon (E-commerce giant), Apple Inc. services, IBM, KPMG, Deloitte etc are major consulting services providers investing in India (India Brand Equity Foundation 2016: 1). The following sectors (in descending order) follow the service sector in terms of FDI investment: Telecommunications (radio paging, cellular mobile, basic telephone services), electronic equipment (including computer software, hardware & electronics), Chemical industry and fuel industry. The maximum percentage of FDI is taken by services (32,791 Million US$ during 1991-2014) such as banking, financial services, and telecommunications that are not pollution intensive, whereas others sectors such as chemical and fuel industry possess the traits of pollution intensive industries.

Unlike India, the sector that attracts the largest quantum of FDI in Bangladesh (1996-2014) has been telecommunications and transport followed by power sector (gas and petroleum), textile sector, banking and heavy manufacturing sector. Telecommunication attracts the maximum FDI due to privatization efforts by government. The high growth trajectory of this sector is because of the transition of the population from rural to urban settings, increased access to communications, higher employment, reduced transaction costs and encouragement to entrepreneurism. Operators such as Banglalink, Robi and

Teletalk, are interested in investments both locally and internationally (Bangladesh Board of Investment 2014: 2).

Foreign investors such as Chevron, Tata and Niko dominate the power sector, which is the second highest FDI attracting sector in Bangladesh. The textile sector, especially the readymade garments industry, is a major source of growth in Bangladesh because of cheap labour and lower labor norms compared to developed economies. It is important to note that both the power and the textile sector are energy intensive sectors and affect environment adversely. These sectors utilize water and soil resource and further impact air and natural habitat negatively. In contrast, India's major FDI sectors- Services and Telecommunication are less energy intensive.

V. 3 (iii) Comparative Analysis on the basis of Trends of FDI

In India the largest FDI is received from Mauritius followed by USA, United Kingdom, Japan and Netherlands. The reason for receiving such a huge FDI from world's largest and developed economies is the growing potential of Indian economy in the world, and its economic dominance in South Asia. India is the main FDI recipient country in Asia and comes behind China. This fact is supported by UNCTAD World Investment Report (2015), which states that India has improved its position to 5^{th} top host country for FDI in 2014 from its 9^{th} rank in 2013. In the South Asian region, India attracts FDI in services and manufacturing sector while Bangladesh attracts Greenfield investments in natural gas, chemicals, manufacturing and readymade garments sectors.

Some of the incentives to foreign investors for investing in India are its openness to all kind of investments, active participation in global mergers and acquisition market, tax treaties, international expansion activities and intraregional investment in neighboring countries (World Investment Report 2015: 5). Indian Government's initiatives to open up various sectors from time to time and its expanding activities encourage investors to invest. This position is also supported by current NDA government, which is pushing to generate even more foreign investment. As a consequence we observe increased mergers

and acquisitions with world players (Tata Motors with Mercedes-Benz, GVK Power with Hancock Coal, Aditya Birla with US based Columbian Chemicals), which is evidence of the increased collaboration between India and global MNCs (Rao 2011: 16). India is going full steam ahead to promote investment in India and that is why tax treaties have been extended by India to Mauritius and 16 other countries, further deepening financial and cultural ties with India. This has encouraged other countries such as USA, UK etc to revise the treaties with India and convert it to tax treaties similar to the conversion by Mauritius and Singapore (Global finance Mauritius 2016: 1).

Bangladesh has received maximum FDI from UK followed by USA, Egypt, South Korea and Netherlands. It has emerged as an important player in South Asia in the manufacturing and export of ready-made garments sectors. This has linked Bangladesh to the global value chain and markets, and it has now emerged as a hot spot destination for garment investors. Textile sector, which is the backbone of Bangladesh economy, attracts investment from UK, Canada, Malaysia and USA. The second tier investment comes from Korea, China, Thailand, Germany, Singapore and Indian insurance, banking, and gas and fuel industry. Telecommunication sector attracts investment from Malaysia (Aktel), U.A.E. (Warid Telecom) and Norway.

Bangladesh has advantages in textile, telecommunications and power sectors. As opposed to that India has a distinct advantage in services, manufacturing and portfolio investments. Comparison on the direction of FDI reveals that India attracts major investment from Mauritius, USA, UK, and Japan while Bangladesh attracts FDI from UK, Egypt, and South Korea. The FDI inflows in India are much higher than Bangladesh partly because of the huge size of Indian economy. It also shows India's economic stature in the world and South Asia is more powerful and influential than Bangladesh. India and Bangladesh are not rivals for FDI as both have comparative advantage in certain areas.

The varieties of investments are more in case of India because of its larger economic size and the high demand driven by its huge population. It is noticed that India attracts FDI to nonpolluting sectors such as services and portfolio investments while, Bangladesh

attracts FDI in textile, heavy manufacturing and power sectors, which are pollution intensive sectors.

V. 4 FDI and Environment: Comparative Study using Empirical Analysis

FDI does not enter into the territory of host country with only positive outcomes. It has number of negative effects on the host country's economy, society, geography and environment. Most of the countries globally applaud and welcome foreign investment and consider it as a boon for the host country while ignoring the spillover effects, which are longer lasting. Hence an analysis of the long run impact of FDI on the environment is needed in today's global situation. An empirical analysis was done in chapter II and III of this thesis on India and Bangladesh to see the long run impact of FDI on environment on the respective countries using an econometric exercise. The results obtained are interesting. A causality, error correction and co-integration test was performed to see the long run impact of FDI on exports, imports, GDP growth, CO_2 and energy consumption. The results obtained in case of India shows that a long run unidirectional relationship exists between GDP and energy as well as a bidirectional relationship exists between imports and energy use. On the other hand, in case of Bangladesh, results obtained show that unidirectional relationship exists between imports and carbon emissions, FDI inflows and exports, exports and CO_2 and most important FDI and CO_2.

A causal relationship is found to exist between FDI and CO_2 in Bangladesh. FDI is causing emission in long run, which highlights the fact that the technology being imported in the form of FDI and trade (exports and imports) is impacting the environment adversely and causing carbon emissions. This means that the Pollution Haven Hypothesis is true in case of Bangladesh. In this case it can be assumed that developed countries such as UK, South Korea, Canada and USA are relocating their pollution intensive technology to Bangladesh so that the negative environmental impact is shifted to the host country (Bangladesh). The other possibility can be that Bangladesh, similar to other developing countries, purposely undervalues its environmental norms to attract FDI. Examples of such undervaluing laws are seen in the case of Chevron and Niko, which are thriving in Bangladesh's energy sector even after causing massive damage to the environment and society. By allowing such pollution intensive foreign investments and to continue

expansion without stricter controls, Bangladesh is setting itself up for further environmental damages and increase of economic activities in polluting industries.

As compared to Bangladesh, India invites foreign investment in a much greater quantity but the FDI attracted is not found to be causing environmental degradation. The empirical analysis did not find any causal relationship between FDI and CO_2. The reasons can be that the inflow of FDI is majorly in services sector, which is a non-polluting sector. Secondly, India is attracting more FII (Foreign Institutional Investment)[37] in past few years and creating an ecosystem for growth of FIIs which and are also not pollution intensive. The Ministry of External Affairs stated that India was the most favored equity market for the global investors for the year 2015 with a 43% share which is more than the share of China (Ministry of External Affairs 2016: 1).

India also faces criticism because of the negative effects of FDI on environment but the results obtained empirically contradict that belief; therefore one possibility can be that FDI creates scale effect for a short time and thus does not have a relationship in the long run. The scale effect is an effect of economic activities (for instance trade and FDI), that causes increase in pollution emissions and depletion. In such cases it can be said that the domestic industries of India are pollution intensive rather than the foreign investments. Pollution halo effect (exist around multinational firms when they are less polluting than domestic firms) might exist rather than the existence of PHH phenomenon for India after liberalization. Studies by Aliyu, Eskeland and Harrison (2005 and 1997) support the fact that, for India, FDI helps in the reduction of pollution in developing countries. This happens because techniques of production brought over as a result of the foreign investment are much more environment friendly than the ones originally used by the host country.

In case of Bangladesh, a study by Azizul and Islam supported the finding that Niko had caused various environmental incidents such as chemical leaks, blowouts and explosions that resulted in human and environmental destruction. As discussed previously in the thesis, the textile and readymade garments industry attracts large

[37] FIIs are investments in financial markets of the other country like in mutual funds, securities, pension funds, hedge funds and insurance companies.

amount of FDI and is the backbone of Bangladesh economy. A study by Islam et al. (2011),) focused on the textile industry states that "in Bangladesh due to textile industries, the negative effects are affecting the local environment and human health severely". Thus we see how the negative effect of the large investment in textile and garment industry causes a negative impact on the environment in Bangladesh at a large scale. Trade liberalization in Bangladesh has increased international trade and FDI and furthered economic growth, but this has come at the cost of environment. This argument is supported by Dean (2012), who found that in China, "trade aggravates pollution on one side and improves terms of trade, but mitigates it via income growth".

Similar observation can be made for Bangladesh, where foreign investments have increased the international trade of the country. However it has also increased environmental degradation through carbon emissions. This means that the goods and services exported and imported are pollution intensive and result in degradation. Hence, it is proved in case of Bangladesh that international trade is a driver of growth and development on one side and a driver of environmental pollution and pollution intensive trade on the other. This is in contrast to India, where the goods produced and traded are environment friendly. This argument is supported in a research by Mukhopadhya and Chakraborty (2005), who found that India produces and imports environment friendly goods and services.

A causal relationship was found between GDP growth and energy use for India but not in case of Bangladesh. This means in India, the more the economic activities increase in long run; the more energy is/will be consumed. The main sources of energy in India are coal, natural gas, petroleum, power (including nuclear, hydro and thermal) and renewable energy resources. The production, distribution and consumption are three steps of economic activities which involve energy use, the more these activities will increase the more consumption of energy will extend. Hence in case of India with economic activities (GDP) and energy use goes hand in hand. On the other hand Bangladesh's GDP growth, which was recorded at 6% in 2014, has had no such impact because of the excess dependence on imports.

The overall comparative analysis of impact of FDI on environment when tested empirically proves that FDI is a boon for India by helping its economy in GDP growth and transfer of better technologies. Economic theories that were discussed earlier in the thesis such as the endogenous growth theory, technology-gap approach and Simon Kuznets law support the results of the empirical analysis. The endogenous growth and technology-gap approach says that FDI promotes economic growth of developing countries and transfers environment friendly techniques of production from developed countries to host country (India). Similar to that, Kuznets law is also applicable to India, i.e. as the per capita income level of any country rises; the people demand a cleaner environment by creating political demands for tougher environmental standards. According to data released by Ministry of Statistics and Program Implementations in 2014-15 per capita income in India was Rs 86,879 which grew at the rate of 7.4% to Rs 93,293 (2015-16) (The Economic Times, 31 May 2016). The rising per capita, civil society awareness and environment awareness are the reasons of increase in trade and investment but not at the cost of the environment.

A different impact of FDI is observed in the case of Bangladesh. Its international trade and foreign investment inflows to the country are increasing since adoption of economic reforms. It has moved away from being solely an agrarian economy, and has opened its industrial and external sectors. This has helped the economy to increase its exports, imports and foreign investments. Bangladesh realized the importance of external sector in the development of the economy and hence from time to time takes regulatory and positive measures to increase the flows of FDI. However, Bangladesh is paying for the cost of development with its environment. Poor environmental regulations, corruption, political unrest are the main reasons of such long-term negative effects. Apart from Pollution havens hypothesis, the classical trade theory of comparative advantages is also apt in case of Bangladesh. According to that theory, the environment is another factor of production in which low stringent environmental laws decreases the production costs and vice-versa. Therefore, Bangladesh has comparative advantage in the production of polluting goods and this shows that Bangladesh has low pollution control expenditure domestically.

V.5 FDI in India and Bangladesh: Comparative Analysis on the basis of Case Study of Pharmaceuticals and Energy sector

Apart from the comparative study on the basis of empirical analysis, another technique is also used in which a case study from each India and Bangladesh is taken to see the effects on the grass root level environment, society and geography. To that end, a field visit to Chevron Corporation in Bangladesh and GlaxoSmithKline in India was conducted and the results obtained are discussed in chapter IV of the thesis.

After perusing through a large set of literature and case studies on Bangladesh, four important case studies on FDI and environment were taken for analysis. These case studies are Rana plaza (textile sector) case study, Occidental's Magurchara gas field case study, Niko's Tengratila gas field case study and Chevron's Lawachara gas explosion case study. Out of all four, Chevron was chosen for field visit to assess the effects of foreign investment on Bangladesh society, environment, geography and policies. The reasons of choosing Chevron out of these four is that it is one of the largest gas exploration and producing IOC's in Bangladesh with the total production of 1,315.5 MMCF gas during fiscal year 2013-14 from its three wells (Jalalabad, Maulavibazar and Bibiyana gas field) mentioned in Petrobangla Annual Report (2014). Second reason for choosing Chevron case study is that despite being one of the oldest and responsible exploration company, its exploration caused massive gas explosion in Lawachara national park. The resumed activities of Chevron after the explosion in Bangladesh gas fields also provide an interesting insight.

Hence, keeping these questions in mind a visit to Bangladesh was made and the results obtained provide valuable insights. Chevron is involved in exploration activity since 1997 in Bangladesh and performed a 3D seismic survey in 2008 without informing the local and state authorities and caused an explosion in the forest area. The forest area called Lawachara: a national park, home of Khasia tribe, has a fragile landscape with a very rich biodiversity and is also USAID's environment project area. USAID called the project of Lawachara conservation project as 'Nishorgo project'. According to the USAID, this project was a public-private partnership project in which state actors, non-state actors and local community participate based on co-management approach. In spite

of all these factors Chevron, a responsible corporation violated the Bangladeshi environmental laws and regulations, broke the trust of the Bangladesh government, but most importantly adversely affected the environment and society because of the explosion. The problem did not finish with the explosion and its direct effects and but was seen again when Chevron reentered the gas exploration market. Quite against the expectations, Chevron received clearance by the government and occupied the maximum number of wells in IOCs list. This helps us in arriving at diverse conclusions about FDI and its role in Bangladesh as listed below:

- The environmental laws in Bangladesh are less stringent with lower enforcement as compared to India. This is seen in the case of Chevron, which has violated the Bangladesh Wildlife (Preservation) Order, 1973 (President's Order No. 23 of 1973), and the Wild Life Preservation Act 1974 (Amended) which clearly states that mining, cultivation or any other such activities are not allowed in forest. Ignoring the law, Chevron conducted a 3D seismic survey, which is an indicator of either lax enforcement or lower environment standards/laws. India on the other hand has shown willingness to ensure compliance to its regulations and if not possible ensure punishment (as seen in the case of GSK). This could be largely because India witnessed some of the worst adverse environmental and human impact of FDI like Bhopal Gas tragedy and learnt so much out of fighting such issues both at the global and national level. On top of it India also has one of the most vocal civil society actors and institutions to check any excesses by the FDI agents in infringing upon the environmental norms etc.

- Political loopholes such as corruption, lack of authoritativeness, ignorance and lack of transparency are present in the Bangladeshi political system that is reflected in such incidences. The indifferent role played by regulatory bodies such as Petrobangla, Ministry of Environment and Forests, local and central government and the board of investments shows the lack of institutional support for the local people and wildlife. The regulatory body for exploration activities is Petrobangla, which denied its involvement and knowledge of the incidence. The MoEF had approved Chevron's survey; a similar role was played by the local and

central government, which gave Chevron a clean chit to resume its activities. In fact the authorities supported the seismic survey and denied their roles in the explosion incident by shifting blame to the other parties involved.

- The impact of the explosion on the society was completely ignored; the Khasia tribes who are natives of the land and part of the cultural heritage of Bangladesh were kept in constant danger by such explorations. Apart from that, eco-tourism, which could have become a major source of income for the locals, was given low priority. Even to date, there are no substantial safety measures issued by Chevron to ensure the protection of local communities, environment and society of their exploration fields.

- The incidence, which authorities called a small incidence because of the smaller size of the Lawachara gas field as compare to Bibiyana and Jalalabad gas fields, is in fact not small when the effects on environment are taken into account. Nineteen species listed were and continue to be threatened in Lawachara Park, including the Hoolock gibbons many of which died during the fire explosion. All these happened despite the presence of institutions such as BELA and SEHD and others who have been closely watching, highlighting and opposing the violation of basic environmental and other norms by the FDI related agencies.

Similar exercise was also performed in India where four such case studies were chosen which had a huge impact on Indian economy in terms of health, society, environment and community. The first case study selected was the Union Carbide – Bhopal gas tragedy, which was important as it was one of the world's most deadly disasters. The other case studies selected were Pepsi and Coca-Cola, POSCO, Kudankulam nuclear plant and GSK. GSK was chosen for detailed field analysis as it is a major player in the huge pharmaceuticals sectors and thus helps us see the effects of this foreign investment on society, health and environment. Choosing pharmaceutical sector was important because of the growing demand of healthcare and pharmaceutical industries in India. The demand is increasing rapidly because the population is also increasing.

Secondly, GSK is one of the oldest pharmaceutical companies operating in India (since 1924) and it is the World's sixth largest pharma player (details discussed in Chapter IV). It plays a key role in the Indian pharmaceutical sector. Thirdly, while there are many sectors such as energy, chemicals, textile, mining etc that are impacting the environment directly or indirectly and using environment in one of its production process, the pharmaceutical sector impacts the host country's society and community even if the impact on environment is not very obvious.. Hence a detailed analysis was done.

GSK came into controversy and limelight when it was dragged into the 'drug trial controversy' that took lives of many by trapping thousands into the free cancer drug trials. The incidence has not affected the environment but rather the health of the society, which defines the negative effects of FDI on community. The details of the GSK's drug trial were dealt in IV.5 of the thesis. Here the effects of GSK being a foreign investment on community are analyzed. Indian Government since 2005 after becoming fully complaints to TRIPS (Trade Related Aspects of Intellectual Property Rights) focuses on clinical trials because in India there are large pool of patients and thus a huge potential of scientific and financial gains, but only when clinical ethics are applied. In a decision that was purely for financial gains, the government allowed the trial of cancer vaccine by GSK.

The ruling party of that time took a decision to allow such trials to compromise its valuable human resources, which ultimately resulted in loss of human lives (Mondal 2015: 3). GSK is not the only foreign company involved in that incident; another company called Merck was involved in it along with the help of the famous Bill & Melinda Foundation. These actors failed to live to its ethical standards and denied any responsibility for the deaths. The government and institutions such as the Supreme Court stepped in and took steps of punishing GSK (Gautam 2010: 114). The role of government after the incidence was appreciable as, unlike Bangladesh, the involved companies were penalized and strict action against GSK was taken by suspending its many patents and 19 drugs trials in India in 2010. Food and drug Administration (FDA) gave clear instructions

to GSK to stop controversial trials and inform all 1,300 people who are involved about the risk (Heart attack risk) because of medicine.

Analyzing two case studies closely from India and Bangladesh shows the effects on environment, health and society. But the nature of both the FDI's effects is not same. The impact caused by Chevron on the environment is unacceptable and so is GSK's impact on health, but the post incidence actions determine the stringency and regulatory framework of the government, civil society and communities. In case of Bangladesh, the impact on human health, society and environment was huge, yet the role of regulatory bodies and institutional frameworks was found to be disappointing. The cycle of ignorance, denial, blaming and repeating its mistakes (clearance to Chevron) continues. Further, no changes have taken place in the less stringent FDI and environment laws, and the fragile political structure still exists. Chevron was not penalized and with clearance certificate continues to work in Bangladesh. The role played by civil society groups, lawyers' organizations and community were also negligible.

As compared to this, the drug trial controversy that occurred in India was also intolerable and impacted the health of patients. But in this case the actions taken by regulatory bodies against foreign investor (GSK) were appreciable. Supreme Court, civil society groups, Food and Drug Administration and community took commendable action. This helped the government to take strict action against GSK and stop its carefree attitude towards Indian community and health of society, something that was found absent in case of Bangladesh. The difference in attitude towards foreign investment shown by India and Bangladesh, when faced by controversy, shows the extent and nature of coordination among the institutions (like government, civil society, law making agencies and society) related to environment and FDI.

The laws and regulations related to India and Bangladesh are important to discuss in this chapter so that a concrete policy recommendation can be drawn. In chapter I, FDI policies, Environmental laws and Acts were discussed in brief. In the upcoming section of the chapter, an analysis of the violation and compliance of these acts will be discussed in detail for both the countries. This will help in comparing whether the environmental

laws that is in place in these countries adequate enough to address the multifarious environmental impact of the FDI.

V.6 Regulatory and Environmental frameworks for FDI: A Comparative Analysis between Bangladesh and India

Chapter 1 of this thesis has briefly discussed the laws and acts which are meant for foreign investments and environmental protection in India and Bangladesh. This section makes an attempt to analyze how some of the environmental norms were violated by foreign companies during their operations. During the analysis of the cases studies, it was found that the foreign companies complied with the rules and laws of FDI that enabled it to enter the host country; but once they entered, they relaxed its compliance to the operating environmental laws.

V. 6 (i) Environmental Regulations and Acts of Bangladesh

There are many environmental regulations that have been enacted by Bangladesh to curb the adverse effects of foreign investments, industrializations and urbanization on the environment. The MoEF mainly controls the environmental regulations. The ministry has even compartmentalized the industries into three different categories – Red, Orange and Green. These compartments are made based on the pollution related factors of the proposed investment (local and foreign). The important acts and laws which were breached by foreign investors to gain profits are:

- The Bangladesh Environment Conservation Act (1995) and Rules (1997), which has the objective to conserve, improve and control environmental pollution. This act was violated almost by each and every foreign investors investing in gas and oil sectors such as Unocal, Chevron and Niko (Gain 2002: 289). They polluted the environment through explosions, harmed the conservation areas of Magurchara, Tangratila and Lawachara forests. These projects have missed a mandatory feature of this Act to arrange for a public hearing if any entity is found to be damaging the environment. After the occurrence of major incidences from these

three FDIs, Department of Environment was expected to conduct public hearing as the loss of people around the project sites and forests was huge. However, this was totally ignored by the Bangladesh authorities.

- Under the rules of the Bangladesh Conservation Act (1995), there was a provision to treat all effluents before they are discharged (Ibid: 289). This also applies to the readymade garments industry, fabric dying and chemical processing industries in Bangladesh, which attract huge amount of foreign investments and is under red category (High polluting industries). These industries (Puma, GAP, and Levis etc) are located mainly in Gazipur and Narayanganj industrial area, and discharge various physiochemical effluents in the water bodies without treatment. As a result, people have complained of deteriorating water level with low pH level, arsenic water, and presence of metals like copper and mercury (Islam et al. 2011: 175). The EIA report has also shown the negative impact of these discharged effluents on physic-ecological environment. This means that these MNCs are discharging the effluents directly into the water streams around the plant site without following the requirement to treat as required by the Conservation Act.

- The Environment Conservation Rules (ECR), 1997 is the act that sets out the minimum environmental quality standards (EQS) for air, water, soil etc (Bureau of Economic and Business Affairs, USA 2013: 224). The Rana Plaza was build up on a land that was filled up with loose soil and clay. The ECR law was ignored completely by the government itself and the companies operating in the plaza were not prevented operating in such buildings. As a consequence the Rana Plaza was not able to tolerate the load and hence collapsed.

- The Environmental Court Act, (2000), is authorized to charge fine and compensation for the affected people. The demerit of this Act is that the claimant has to pay the court fee (Gain 2002: 289). According to this Act, post Magurchara, Lawachara, Rana Plaza collapse and Tangrtila incidence compensation should have been imposed on the polluters under this act but the

Act has played a negligible role due to the clause of court fees associated with this. This kind of clause is a discouragement to the claimant and sufferers as the procedure and cost are not convenient.

- The Forest Act, 1927 and the Forest (Amendment) Act 2000 aims to deal with the day-to-day management of forest resources along with the protection and preservation of forests (Ibid: 289). The best example of violation of this act was Lawachhara and Magurchara incidences when the explosion burned out the forests, flora and fauna. The forest of Lawachhara is a mixed tropical evergreen forest, which supports indigenous vegetation that were burnt due to the explosion.

- Article 23(3), Wildlife Preservation Act, 1974 (Amended) was violated by Chevron at Lawachhara when the exploration was held in the breeding season of birds and animals. This exploration has threatened the species including the rare Hollock Gibbons found there which are missing now after the incidence. The explosion has also affected the breeding of the animals and birds at that time and violated the Wildlife Birds & Animal Protection Act, 1912 provided for the preservation of the other kinds of wildlife (USAID Report 2006: 10).

- The Fish Act, 1950 by the Fisheries department works on the protection and conservation of the fishes. The textile industries, which attracts huge FDI is releasing solid effluents, heavy metals and waste acids in the rivers without treatment in Gazipur and Narayanganj which affects the fisheries. Fishes are dying due to these hazardous chemicals, and those that survive are bad human consumption (Gain 2002: 289).

- As part of the effort to improve the environment, investors are required to adhere to certain environmental safety standards in the form of clearance certificates issued by the Department of the Environment. The clearance was given to the FDIs such as Chevron, Unocal, and Niko even after the massive blowouts and explosions, which is against the objective of the standard norms. The objective of

the project was to check the pollution control measures and the environmental impact assessments from time to time and share and implement corrective measures with the public, which was absent in these cases or was never revealed.

V. 6 (ii) Regulatory and Environmental Frameworks for FDI in India

In India, Ministry of Environment and Forests along with the Central Pollution Control Board regulates and monitors the pollution and environment related issues. The policy regulations on environment are amended from time to time. A lapse in adherence to regulations by foreign investors results in incidences such as Bhopal gas tragedy and GSK controversy etc.

- Environmental Protection Act, 1986, amended 1991: This act was made in the wake of the deadliest disaster of Bhopal Gas tragedy (1984). The objective is to monitor the environmental pollutants (Solid, Liquid and Gases) present which are hazardous to environment (Ministry of Environment and Forests 2016: 3). These acts were not in existence at the time of the disasters like Bhopal Gas Tragedy and Union Carbide escaped easily with a very limited punishment.

- National Environment Policy, 2006 is an Act that aims to clean the environment. It has clearly mentioned that environment is not just the responsibility of the state, but is infact a matter of partnership between the citizens and the state. In some cases, the government machinery has taken a contrary view; as observed in the case of Kudankulam and POSCO project, where people protesting against the projects were opposed by the government. There was no public hearing conducted to convince people around the POSCO and Kudankulam; they were just ordered to move away from the project sites. Thus in this case partnership between society and State was not played out. The Atomic Energy Regulatory Board (AERB) and Orissa Government unilaterally decided whether POSCO or Kudankulam are beneficial to society.

- Coastal Regulation Zone (CRZ) comes under the Section 3(1) of the Environment (Protection) Act, 1986 which states clearly in the notification that "setting up of new industries and expansion of existing industries within the Coastal Regulation Zone is prohibited except: (a) those directly related to water front or directly needing foreshore facilities and (b) Project of Department of Atomic Energy (MoEF 1991:1). It is clear from the order that atomic energy sector is allowed to set up near coastal areas still Jairam Ramesh (Former Minister of Environment and Forests) announced that due to violation of Coastal Regulation Zone (ERZ) terms by KKNPP in unit 3 to 6, Central Government has decided not give the plant permission to function. This created confusion, as it was not clear whether the regulation allowed or disallowed the project.

- After seeing the ground realities, the MoEF and civil society groups have alleged violation of Forest Right Act (FRA), Human rights and CRZ by POSCO project in Orissa. The Orissa Government, though, has denied the allegations of violation of the act and the forced migration of the tribal's away from the project area. They say that "One cannot say there has been violation of environmental and CRZ norms as work on the project is yet to take off and this has also been mentioned by Meena Gupta in her report. The compliance of environmental and CRZ norms can be ensured only after work on the project begins" (Business Standard, 22 October 2010).

- Coca- Cola and PepsiCo were alleged to be violating Environment Protection Act, 1986 – dumping of hazardous waste, use of pesticides, depleting the ground water level and lowering the ground water quality. The water used by these beverage manufacturers turn out to be contaminated; the water levels and ground water quality around the plants dropped drastically, metals such as Chromium, Lead and Cadmium were detected in a CSE lab report found these metals in the bottled drinks and High COD (Chemical Oxygen Demand) level in the samples which is clear sign of violation of the environment and the human health.

- GSK was alleged to be violating fundamental human rights, Competition Act 2000 and the ethical guidelines of Drugs and Cosmetics Act. GSK has violated clearly the human rights in India because it gave trial vaccine of cervical cancer to tribal girls, cervarix vaccines to children without consent and generally treating children and people as guinea pigs. It also entered in an anti-competitive agreement between GSK and Sanofi Pasteur India. In results of these drug trials, the Supreme Court of India gave an ultimatum to the government to take appropriate actions against the company. It also wanted consent to be taken from people who participate in the drug trials, along with compensation for those who had suffered previously.

- Parliamentary committee concluded the violation by GSK to be a serious breach of trust, medical ethics and child abuse (Daily Mail, 13 January 2015). The Health and Family Welfare Ministry levied a penalty of 3% of the turnover to deposit within 60 days from both the companies. Apart from that the commission ensured that both the companies cease their anti-competitive practices (Competition Commission of India 2013: 32-33).

To summarize, the Laws and Acts of India and Bangladesh mentioned in the previous sections are meant to be followed at every stage of production, consumption and distribution. The violation of any of them at any stage led to disastrous consequences such as Bhopal gas tragedy, Magurchara and Lawachara explosion, Tengratila blowout and drug trials. This can also leads to protests against foreign investments like POSCO, Kudankulam, PepsiCo and Coca-Cola at various levels. The violation of have taken place in majority of the above mentioned foreign investments at some or the other level, which ultimately raises questions against the government of the host country and also towards the foreign investors. The formations, activation and implementation of Laws and Acts are the responsibilities of the government in host country. Less stringent laws give encouragement to FDIs to bring pollution intensive technology whose end results are polluting products. In cases like Magurchara, Lawachara, Tengratila, Union

Carbide and PepsiCo less stringency of laws and lax enforcement have led to disastrous effects on environment, human health, communities and economy.

On the other hand, strictness of the laws as seen in the cases such as GSK drug trial, POSCO and Kudankulam has prevented the adverse effects in the first place or from continuing after coming into notice. The above mentioned (Section V.6) environmental Acts and Laws are made by the Government of Bangladesh and India to ensure a cleaner environment that are triggered by trade, industrialization, foreign investments and domestic consumption. Breaking the acts and laws results in environment degradation and further affects society, human health and geography. These acts have their area specific importance, which are made for the benefit of the industries, people, investors and sustainable environment of the host country. Hence, these regulations need to be monitored and enforced by the authorities carefully as they are in the mutual interest of foreign investors and host country (India and Bangladesh).

FDI is a critical tool for operating and growing in the current globalized economy. The cost that host countries are willing to pay decides the magnitude and type of effects. The cost Bangladesh is paying is in the form of negative impact to the environment and society, while India successfully manages to ensure environmental and social safety for itself because of its strict policy regime and willingness to adapt. India has in fact come on the track of improving its environmental record and now started working on environmental upgradation while, Bangladesh is still transitioning to balance FDI and environment. Laws and regulations are in place in Bangladesh, but their enforcement is weak. These laws need to be tightened up and authorities need to enforce their countries regulation to prevent environmental exploitation by multinational companies. The policy recommendations and measures will be helpful to strengthen green FDI without compromising the environment (In detail mentioned in Chapter VI).

CHAPTER VI
CONCLUSION

This thesis revolves around the idea that FDI impacts the environment in India and Bangladesh. To assess the impact, both the positive and the negative aspects of FDI are considered. India and Bangladesh present an interesting prism through which this impact can be measured. India is one of the leading economies of South Asia. Bangladesh has followed a similar trajectory to India's, quickly emerging as one of the hotbeds for FDI inflows and international trade in South Asia. FDI has been acknowledged, adopted and encouraged by India and Bangladesh as a potential tool of development in the current world economic scenario.

The first and foremost research question of the thesis was to see the patterns of FDI in India and Bangladesh. The analysis, which started from the first chapter of this thesis, shows that FDI began with gradual economic reforms in both the countries. It passed through progressive phases of economic restriction before transitioning to liberalization. India broke free from the exploitative shackles of British rule to become a free country in 1947. This influenced policies discouraging FDI post-independence till India adopted an industrial policy in which a regulated investment was allowed. The inward looking policy of India had legal and constitutional frameworks attached with the investments. The process of economic reforms began back in the late 1970s with industrial reforms that targeted poverty reduction and economic growth. India adopted a policy of economic reforms in 1991, when it realized the increasing importance of foreign investment, global market expansion and privatization.

India saw limited FDI inflows during the initial years as there were many restrictions that had still not been removed. It began its journey from a small amount of FDI in 1991 ($167 million) to its highest inflow at $16,054 Million in 2013-14, which was achieved as a result of several amendments to the FDI policy. Currently, India's FDI volume is high and mostly comes from the developed and leading economies of the world such as USA, Netherlands, UK, Japan, Germany, Singapore etc.

Various global economic power houses are investing in India because of factors such as educated worker class, abundant resources, an English speaking young population and a growing market and demand for goods and services. A major portion of the investments in India are routed through Mauritius because of its double taxation avoidance agreement with India which helps save taxes. The important sectors that attract investors include services, computer hardware and software, transportation sectors, pharmaceuticals, heavy machineries and manufacturing industries. Services such as technology services, health services, software design, and technology services are not only adding to domestic market but at the same time increase investment in the manufacturing sector. The shift of India from a restrictive framework to a liberalized framework has helped it to stand strong in South Asia and the world. Today, India has become a hub of investment and it continues to build a diverse portfolio of investment attracting sectors.

Bangladesh gained independence in 1971 from Pakistan. Economic reforms took place in Bangladesh under the structural reforms of IMF. Soon after adopting the reform policy in 1980's, Bangladesh realized the importance of FDI and brought in several policy measures to encourage foreign investments. These changes instilled a sense of confidence in the investors thinking of long-term investment in Bangladesh, even though there were many apprehensions about the performance of the economy by local and international think tanks. The inflows were low in the beginning (366.85 Million US$ during 1996-97) due to a lack of infrastructure facilities, absence of laws and regulations for FDI, and political restlessness.

During 2013-14, FDI increased and was at recorded 1181.44 Million US$. Over 19 years the highest FDI was recorded in 2012-13 (1730.63 Million US$) mainly because of increase in reinvested earnings, intra-company loans and equity capital. The top three sectors for FDI in Bangladesh include telecommunications, power sector and textile. The reasons for the increased FDI in these sectors were the increasing demands of the local population, abundant natural gas resources, rising market of readymade garments in the

world, cheap labour and low cost of capital investment.. The various developed countries seek to invest in specific areas and sectors that maximize their profits, for instance United Kingdom and USA invest majorly in power and textile sectors, Egypt in telecommunication sector, South Korea and Netherlands in the trade and commerce sector. Understanding its competitive advantages, Bangladesh has focused on attracting investment in energy and manufacturing sector.

FDI is an opportunity for developing countries such as India and Bangladesh to grow by opening up their specialized sectors and by utilizing their competitive advantages. Over the years, FDI has brought a major change in the earnings and development of India and Bangladesh by bringing in better technology, capital, revenue, trade expansion, positive investment climate, employment and competitiveness (both domestic and international). There are many theories that support the long-term positive impacts of FDI such as Porter hypothesis, Endogenous growth theories, technology gap theories and Simon Kuznets laws. All these theories state that FDI promotes the economic growth of the developing countries and have a net positive effect on the environment. The further theories further posit that when an economy is in the transition phase of development, environment damages are high, but in the long term people demand a better environment and are willing to pay for that.

Many studies have concluded that FDI not only helps in economic growth, but also encourages domestic investment, increases export-oriented sectors, and produces environment friendly goods and services. A key factor for both countries to attain such positive outcomes of FDI is the strict enactment and enforcement of laws and regulations. Opposing the above mentioned line of thought, a vast body of research and literature exists, which believes that FDI has a net negative impact. Similarly, many more researchers have studied theoretically and empirically the effects of FDI and believe in the negative effects of FDI on the host economy. Theories that support the negative effects of FDI on host economies are Pollution Havens Hypothesis, Classical theories of comparative advantages and Pollution Holes concept. Collective results of their studies show that FDI and environment deterioration are directly correlated, which means that

the higher the FDI, greater will be the water pollution, carbon emission, dumping, noise pollution and solid waste. The probable reasons for such consequences are low stringent environmental regulations, pollution intensive production, obsolete and pollution intensive technologies in the form of FDI, removal of tariff barriers, and low pollution costs in host country and trade liberalization.

If the environmental laws are less stringent and contain loopholes in the policies, the effects will be devastating on the environment. Developing countries are more prone to such effects as their laws and regulations are usually less stringent in order to attract more FDI. It is important to note that the nature and degree of adverse environmental impact in India and Bangladesh varies with the origin, nature and standard of the FDI investing companies. On the brighter side, FDI facilitates growth and development by bringing better and innovative technology from the foreign investors. While both the theoretical arguments have merit, they do not provide a concrete understanding of the role of FDI in India and Bangladesh. Hence, for specific and clear results, an empirical study was performed that can provide a decisive outcome.

From the mixed results of the theoretical analysis, it emerges that the host country faces both positive and negative effects of FDI validating the hypothesis that "both, the polluting and the nonpolluting sectors in India and Bangladesh have attracted steady flow of FDI despite a regulatory framework". On the other hand, the empirical analysis for India only partially validates the hypothesis, as it attracts FDI mostly in the nonpolluting sector. In the case of Bangladesh however, the hypothesis is fully supported as it attracts FDI in both the polluting as well as the nonpolluting sectors. It is observed that Bangladesh sees more FDI inflows in its polluting sectors (gas and oil sector, Textile sector etc) over nonpolluting sectors (such as services, telecommunications).

The empirical analysis conducted as part of this thesis, explain the actual situation in India after liberalization. The results obtained from the empirical analysis clearly shows long run causal relationship between GDP and energy use, indicating economic activities in India are the major cause of energy consumption. The positive relationship

between GDP and energy consumption in long run supports the EKC hypothesis, which says that as income increases, energy consumption and pollution increase but after a threshold level of income, energy consumption and environmental degradation begin to decline. Since India is in transition phase, the economic growth (GDP), with income increases causes high level of energy consumption. Another bi-directional relationship was found between imports and energy use.

This clearly shows that imports are energy dependent because trade is dependent on productions of goods and services, consumption and distribution which are energy consuming process from production to distribution and to consumption. However, there no causality was found between energy and $CO_{2,}$ exports and $CO_{2,}$ FDI and $CO_{2,}$ GDP and $CO_{2,}$ and Exports and $CO_{2.}$ This proves that FDI is not causing emission in long run, and leads us to believe that the FDI inflows in India are not pollution intensive and the government is taking strict actions to follow environmental laws for foreign investment. Another probable reason is that the inflows are more in the services (around 41%) rather than in the manufacturing sectors (around 23%). The service sector is considered to be a nonpolluting sector; and even the prominent manufacturing sectors such as telecommunication and metallurgical sector pollute relatively less in India. Hence, FDI in India is found to be nonpolluting. An important and interesting reason for the absence of causality between FDI and the environment is the substitution of FDI by FII's, which are not direct polluting agents. Hence, empirically India is in a better position as compared to Bangladesh in terms of the negative effects of FDI.

After analyzing both dimensions (theoretical and empirical) of FDI in India, a similar exercise was performed on Bangladesh and the results clearly show that FDI in Bangladesh is negatively impacting the environment, since polluting sectors (fuel and energy sector, textile sector etc.) have attracted more FDI than non-polluting sectors (services, telecommunication etc.). A unidirectional relationship was found between FDI and $CO_{2,}$ FDI and exports, exports and $CO_{2,}$ imports and $CO_{2,}$ imports and FDI and imports and FDI. This means that the FDI inflows, for Bangladesh, are not only pollution intensive, but also that the imports from various economies of the world are having a

long-term negative effect on the environment. The polluting imports in Bangladesh encourage foreign investors to bring their pollution intensive and obsolete technologies.

Economic openness has helped the Bangladeshi economy to trade and invest internationally at the cost of the environment, society and geography. It can be reasoned that such effects are due to political disturbances, lack of coordination among the institutions, lax environmental laws, weak labour rights and corruption in Bangladesh. These reasons seem to be the factors that lower the standards of investment and trade. The environmental standards of the economy are often compromised by political disturbances and corruption which in turn encourage sudden policy changes, tariffs and duty changes and a poor regulatory framework. The sense of responsibility of the government towards the environment and society is lacking in Bangladesh which ultimately makes FDI a negative tool of development.

The empirical analysis revealed that a causality exists between imports and CO2, exports and CO2. It can thus be inferred that Bangladesh not only imports pollution intensive goods and investments, but also exports pollution intensive (CO2) goods and services. This signifies that the economy focuses on economic growth by increasing exports performance, GDP and FDI. The cost of this growth and development is high as this deteriorates the environment, health of people and impacts the social fabric. Effects of all these three variables (GDP, FDI, and exports) are usually ignored and kept away from public scrutiny. While analyzing the effects of FDI, trade and growth on economy it has been observed that the protests by civil society and local people are not as robust as in the case of India. The MNC's are able to run smoothly without any disturbances by performing a few social charitable activities. They participate in high visibility activities such as opening schools, hospitals, providing compensation and employment, which provide them enough cover to quell any challenges by the society. These activities, without any doubt, have helped generate employment and revenue in the country, but the tainted technology has come with its baggage- damage to the environment. Thus, in the current scenario of trade and investment in Bangladesh it is observed that the liberalization policy has brought investment and trade openness to the economy which

has helped it attain economic growth, higher exports etc.; but all of this has come at the cost of environment deterioration, dumping, and social and institutional challenges.

To further analyze the impact of FDI, case studies of real incidences that occurred as a result of FDI in India and Bangladesh have been done. In Bangladesh, the Magurchara, Niko, Lawachara and Textile sector case studies were studied in depth. While in India, case studies related to Bhopal gas tragedy, Pepsi/Coca-Cola, POSCO, Kudankulam nuclear plant and GlaxoSmithKline pharmaceuticals were analyzed. These case studies were analyzed on the basis of existing literature, media news, government and legal statements etc. These sources have provided an understanding of the business model of the companies. A field trip to Chevron Corporation (Lawachara National Park) from Bangladesh and GlaxoSmithKline pharmaceuticals from India was conducted to provide a grass root level perspective.

All the above mentioned case studies from Bangladesh show the massive environmental dislocations that have occurred as a result of FDI. The weak environmental laws and regulations of Bangladesh helped attract FDI that is characterized by poor technology, weak labour laws, lack of effluent treatments, poor working conditions, massive use of chemical and fertilizer for raw materials production, and an overall ignorance of environmental impact. This type of FDI that is brought in affects the entire socio-economic fabric of the people residing around the disaster area. If the people are not able to adapt to the negative impact of FDI in their area, they are forced to leave their homes to ensure their health and society. In return they receive miniscule compensation, which too comes after public protest and outrage.

A visit to Chevron Corporation confirmed the Pollution Haven Hypothesis. The Chevron Corporation is the biggest investor in Bangladesh's energy sector at around $820 million. Despite its investment size, the disaster caused, and the irresponsible and unaccounted role played by Chevron, along with the role played by Bangladesh government and institutions towards the Lawachara explosion clearly show that all the participants in the explosion were corrupted and careless at some level. To the

amazement of many, the government provided clearance (both IEE and EIA) to Chevron to continue their work even when they were aware of the damaged caused by Chevron.

It has also been observed that no official statements and reports have been made public. This lack of transparency was wrapped under the garb of confidentiality and is questionable because the incident had impacted the people (Khasia tribe), society (Moulvibazar) and environment (Lawachara National Park); no real reason can be discerned for the secrecy. Though the Nishorgo project (Lawachara project) was created for the national interest; the impact that it has had (and continues to have) leads to the belief that the net benefits are not positive enough for the society and environment of Bangladesh. After digging through the details, the complex dynamics of the project can be summarized in one line -"different sources of evidence pointed to Chevron as a negative external agent which exploits the resources, environment and community of the country". The resources which could have been a boon for people, society and environment turned out to be a curse because of corruption and less stringent policies. FDI exploits host countries resources by taking full advantage of systemic corruption, political instability, poverty, inequality and internal conflicts.

Similarly in India, the various case studies that were analyzed are the Bhopal gas tragedy (before economic reforms) whose impact was devastating and felt by the people, society and environment for a long time. The civil society groups, government and institutions played a crucial role in highlighting this incident and the forced exit of Union Carbide. Similarly POSCO, Pepsi, Coca-Cola and Kudankulam nuclear plant are examples of FDI and environmental controversies. In India, all these foreign investments encountered environmental, social and political controversy before establishing themselves but ended up establishing themselves by coordinating the needs of the government, society, people and environment. Though the environmental and FDI regulations of India are challenged from time to time by international allies, investors, local institutions, civil society groups and communities, efforts have always been made to rectify the problem by implementing a better policy or enforcing it strictly.

A visit was made to GlaxoSmithKline in order to obtain primary information on the technological, professional and institutional challenges faced by the foreign investor and on the drug trial controversy of GSK. The result obtained shows that despite being a trust worthy and old foreign investment in India, GSK breached the laws and regulations by conducting illegal drug trials and was punished by Indian law. The government imposed licensing and forced price cut and restrictions. The Supreme Court suspended 157 clinical trials after it became aware of the negative effects of the drug trials on people, environment and community, were by. A committee formed by the Government introduced a multi-level approval process that slowed down the new drug trials. This further resulted in cancelation and suspension of drug trials of foreign and Indian drug companies. Not with standing all the repercussions GSK faced, it continued its investment in India; correcting its approach to meet the operational requirements mandated by the laws and regulations. GSK, wanting to regain the trust of the people, went a step further and rolled out programs to benefit the local people: donation of medicines, establishing sanitation programs, research and training of health workers, India specific disease research on Elephant foot. Thus the various case studies and field trips mentioned above fully validates the hypothesis that "industries with severe environmental impact are located far away from public scrutiny".

Further, the field visits to GSK and Chevron, coupled with the theoretical and empirical analysis, also confirms the hypothesis that "technological backwardness with tilted technology transfer regimes have more damaging environmental impacts". The distinction being that the hypothesis is only partially true in the case of India whereas completely true in case of Bangladesh. The difference stems from the fact that while the regulatory frameworks in Bangladesh are inefficient and import foreign investments majorly in pollution intensive sectors, the frameworks in India are more robust and enforcement stricter. The FDI which is flowing into Bangladesh was technologically backward. Hence the obsolete technology brought into Bangladesh has caused significant environmental damage. On the contrary, India has adequate environmental laws, better nature and extent of coordination among the institutions related to environment and FDI which makes the effects of transferred technology less damaging to the environment.

A different hypothesis of the thesis posits that "industries with severe environmental impacts to be located far away from public glare" is found to true in case of Bangladesh and partially true in case of India. It is partially true in India because while the environmental incidents are initially away from the public glare, the awareness in society and other organizations brings the issue to the notice of the people. This was observed in the case of Kudankulam, POSCO, Pepsi and Coca-Cola controversy. In all these cases the public and civil society groups pressurized the government and authorities to take actions against the adverse effects of these FDIs along with minimizing their consequences. On the other hand, the hypothesis was found to be true for Bangladesh, because even when the environmental disasters occurred the civil society and people could not garner enough attention from the country as a whole to make a difference. The damage causing companies such as Chevron and Niko continue to operate with nil or minimal punishment.

Lastly, it was posited that "the nature and degree of adverse environmental impact in India and Bangladesh varies with the origin, nature, response to and the standard of the FDI making companies". This was observed to be true in all the case studies analyzed such as Chevron, Niko, Union Carbide and PepsiCo/Coca-Cola. These foreign companies caused adverse effects on the society, community, environment and geography in the host countries, acts which were inconsistent with standards normally associated with such international brands. The environmental damage caused by FDIs shows that the companies often ignore the environmental norms of the host countries (India and Bangladesh). In Bangladesh, these FDI making companies created a high degree of devastation because of earlier mentioned reasons such as political instability, corruption, less stringency of laws, volatile economic situations etc. On the other hand, in case of India, the nature and degree of environmental impact was less devastating - exception being the Bhopal gas tragedy which happened before India's economic reforms. India was found to be in a better position vis–à–vis Bangladesh because of various factors. The communities and civil society groups in India played a more visible role, forcing the government to ensure greater compliance and accountability. Indian government had to, therefore, adapt dynamically to the adverse impacts of FDI, creating and enforcing laws

that deterred further violation of the environmental standards. At the same time, the government provided an investment friendly environment that did not compromise the environment, society and health.

FDI is the need of the current era as it is a tool for growth and development. The cost the host countries are willing to pay decides the quantum of effects. The cost Bangladesh is paying is the degradation of the environment. The situation of India and Bangladesh can be explained with Kuznets law which says that as economic activities increases pollution increases and after a threshold level, income and economic activities increases and people demand for better environment and are willing to pay for that. In case of India the threshold level has been attained, while in case of Bangladesh the deterioration phase or existence of Pollution Haven Hypothesis is in progress. There are laws and regulations but their implementation is lacking due to unethical practices, illiteracy, lack of resources, dependence on trade and investment, weak vigilance and regulations. These laws need to be tightened up and authorities need to enforce their countries regulations to prevent environmental exploitation by multinational companies.

VI. 1 Suggestions and Policy recommendations

The inflows of FDI need to be constantly monitored to study its impact to environment, economy and society. India and Bangladesh must religiously follow various policy measures to maximize the positive impact of FDI. FDI's role in economic growth, increasing income levels, efficient utilization of resources is important in today's era and thus cannot be ignored. Hence inviting FDI under the umbrella of rules and regulations will be an advantage for these two and other developing economies.

- Administration should be reformed through appropriate measures. Measures such as timely checks on the performance of foreign investors by the administrative bodies of the host country should be mandated and enforced strictly. These bodies must have experts and civil society representations. If found that they are not functioning properly under the laws and regulations of the country their license needs to be canceled or suspended, depending on the nature of problems.

- Political reforms need to be implemented in case of external sectors such as trade and investment. It needs to be reorganized so as to minimize the interference of the bureaucracy in law and order and ensure a friendly environment for investors. This will help reduce the administrative complexity in context of foreign investment.

- Social awareness and consciousness is important to tackle the various effects of corruption and problems associated with FDI. The society and community around the investment area need to be aware of the adverse effects of the investment and in case of any adversity should approach the local government bodies or investors site directly to deal with the effects of FDI.
- Public-private partnership in FDI can be another efficient measure to encourage foreign investment. Foreign investments made through collaboration with the public bodies of the host countries should be encouraged, as the public bodies are more concerned and aware of the environment of the country. This will help utilize the resources efficiently and the end result will be the benefit accruing to both parties. When the roles of public and private counterparts will be pre decided it would bring transparency in the investment system.

- The development of infrastructure such as roads, transports, buildings, skilled labour, energy supply, regional and world-wide connectivity and strong local market are critical to encourage foreign investments. The new kind of infrastructure incentives like development of industrial parks, export promotion zones and economic zones are also important steps.

- Separate courts for investment and external sector related disputes needs to set up. The aim of such courts should be to fast track the resolution of disputes involving investors, governments and other parties including the communities and civil society.

- Environmental norms for FDI and its spillover effects should be strict. Foreign investors should be made strictly compliable to legal norms to tackle environmental effects such as waste products, air pollution, water pollution etc. Environmental taxes for dumping, pollution, carbon emissions and other environmental externalities needs to enclose with the investment clause.

- FDI in green technology should be promoted and made mandatory by the government for sustainable development of the host economy.

- Tariffs, goods and services taxes (GST) and corporate taxes reforms are a must as they are very high as compared to other countries. The cost of investment in both the countries (India and Bangladesh) is very high as the tariffs and taxes are fragile and keep changing from time to time. This creates hurdles for investors. Measures such as GST in India would go a long way in attracting FDIs of larger variety and in diverse sectors.

- Reform measures in banking and other financial institutions and the capital market reforms should be initiated. Introduction of corporate governance in financial sector will play an enhancing role in investment climate in India and Bangladesh.

- The sectors in which the respective economies specialize need to be encouraged more, and through infrastructure and policy interventions.

- FDI up to 100% in all the sectors is a boon for India and Bangladesh when it is supervised wisely. Public-private partnership should be encouraged.

- Environmental taxation (Green Taxation) and subsidies are must on these foreign investments. Heavy taxation should be imposed on the pollution creating companies and incentives like subsidies should be given as a reward to

environment friendly companies. This will act as a control measure for polluters and incentives for green FDIs.

- Corporate social responsibility for foreign investment companies as well as domestic companies should be mandatory. A certain percentage of their earnings need to be directed towards the social welfare of the host economy and the government must decide in which deprived/needy sector of the society these MNCs should invest in. The percentage of CSR should not be uniform; like income tax, it should depend on the slab of revenue/profit generated.

Both India's and Bangladesh's comparative advantages make them popular destinations. Hence there is less scope to compromise with the regulations, planning and environmental norms. In the long term, sustainable trade and investment will be possible only when strong policies and environment friendly investments are in effect.

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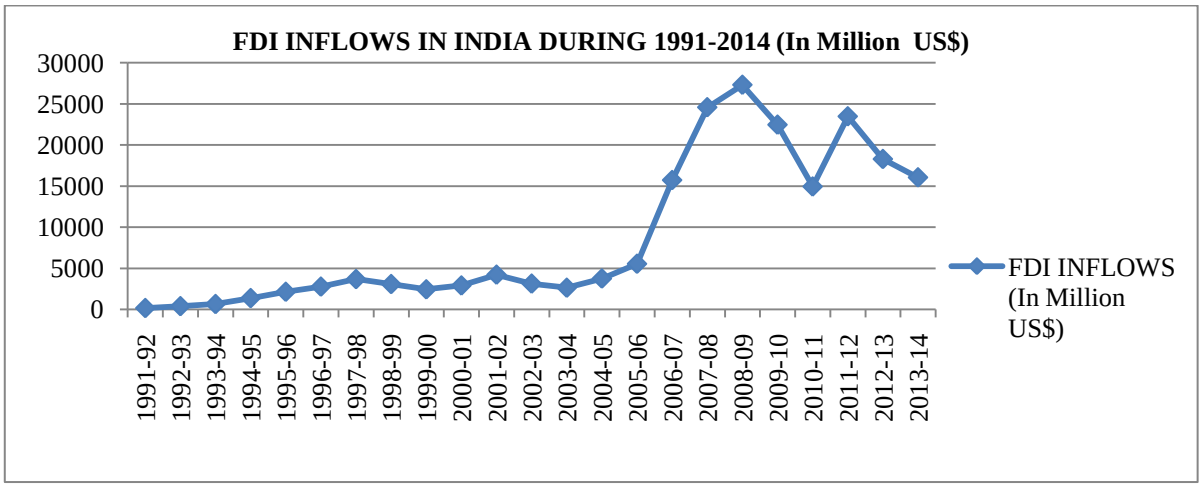
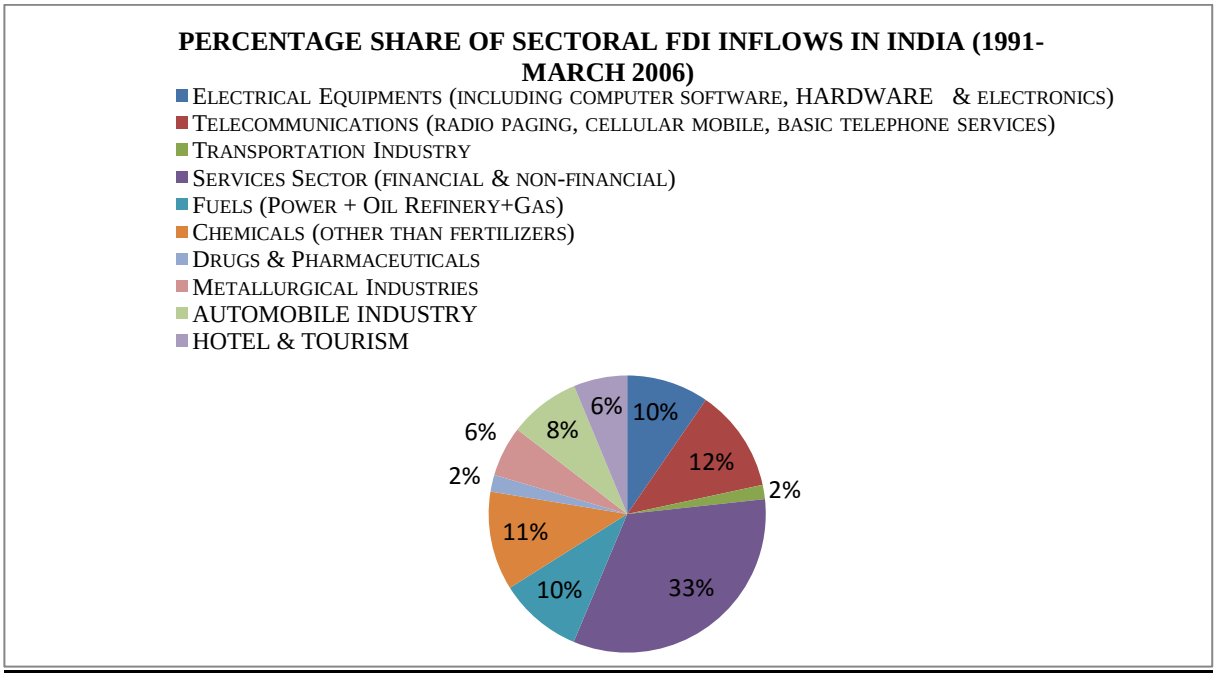
APPENDIX I

Figure I.1: Foreign Direct Investment Inflows Trends in India (1991-2014)



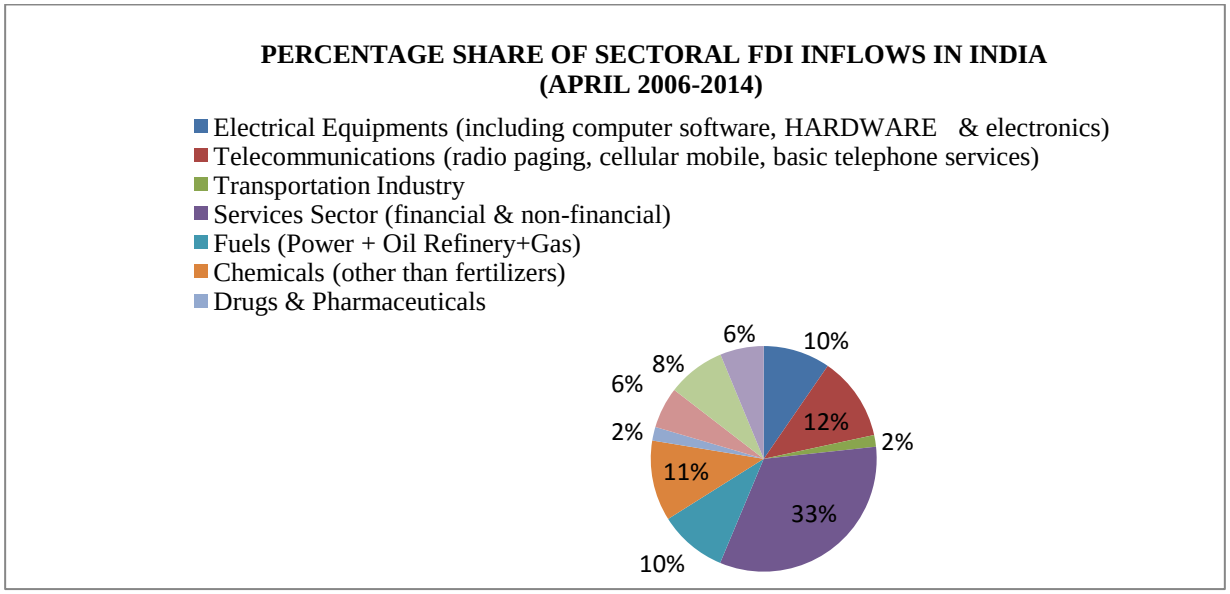
Source: Researcher's contribution based on the data from Department of Industrial Policy and Promotions, Government of India.

Figure I.2: Percentage Share of Sectoral FDI Inflows in India (1991- March 2006)



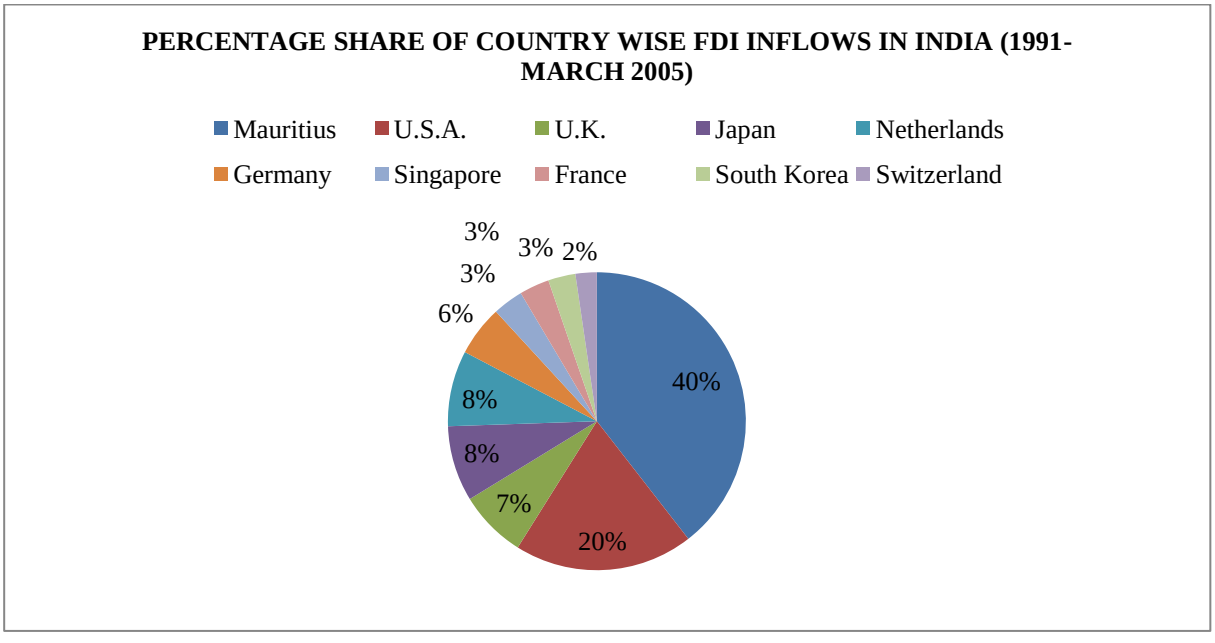
Source: Researcher's contribution based on the data from Department of Industrial Policy and Promotions, Government of India.

Figure I.3: Percentage Share of Sectoral FDI Inflows in India (April 2006- 2014)



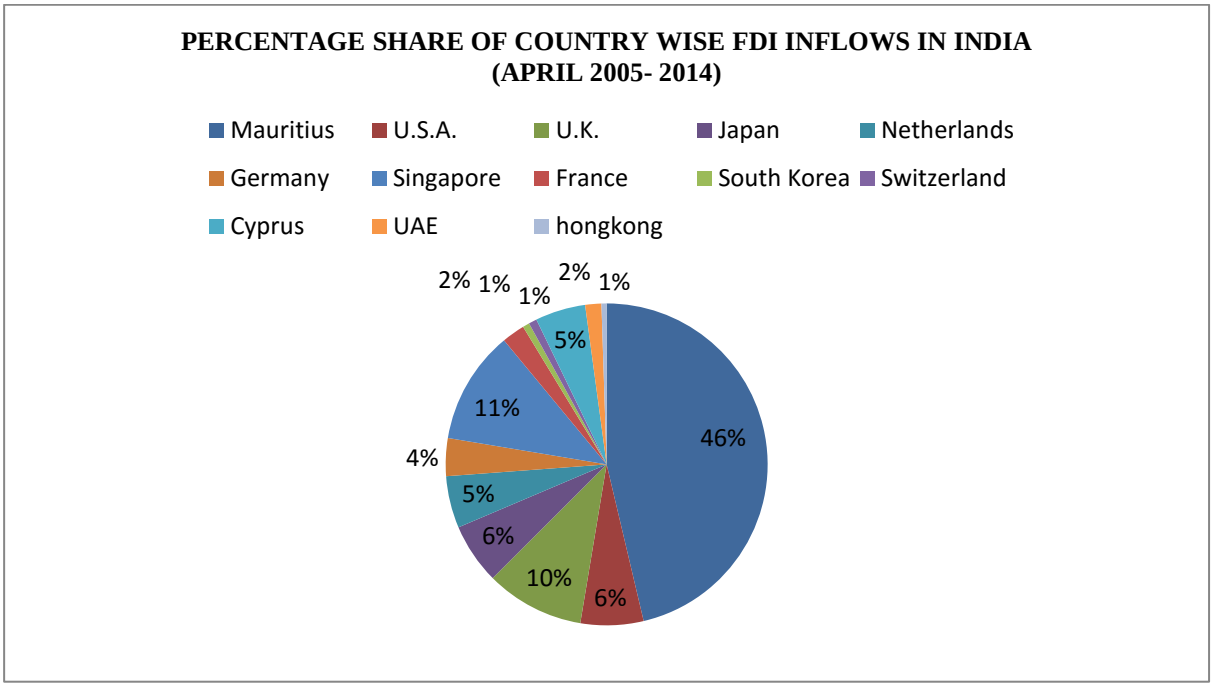
Source: Researcher's contribution based on the data from Department of Industrial Policy and Promotions, Government of India.

Figure I.4: Percentage Share of Country Wise FDI Inflows in India (1991- March 2005)



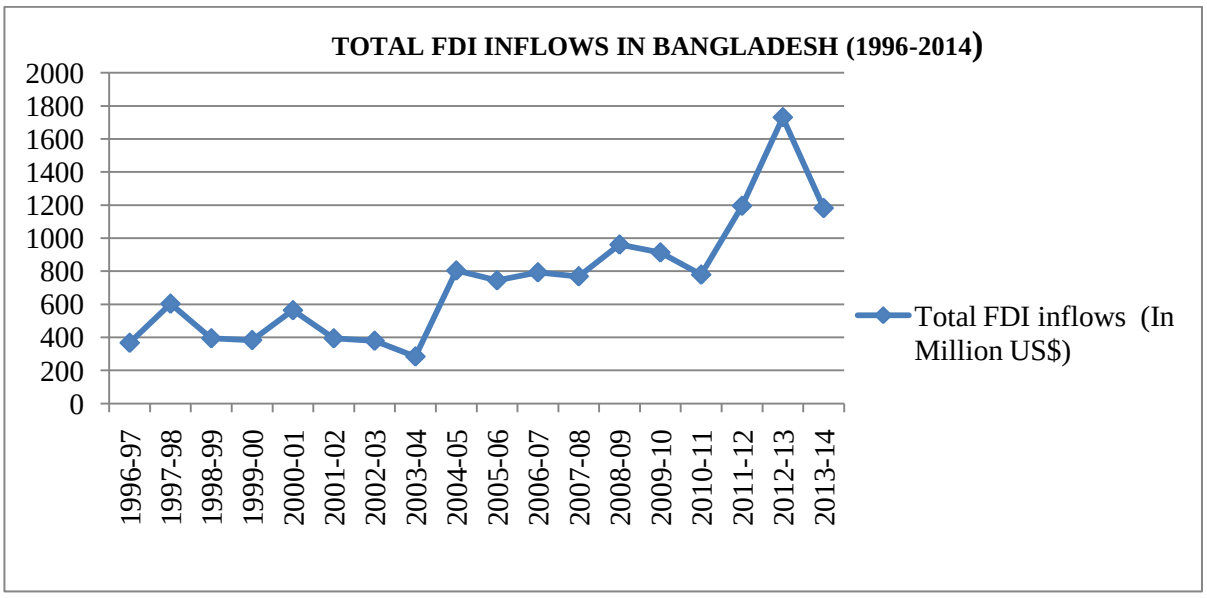
Source: Researcher's contribution based on the data from Department of Industrial Policy and Promotions, Government of India.

Figure I.5: Percentage Share of Country-Wise FDI Inflows in India (April 2005-2014)



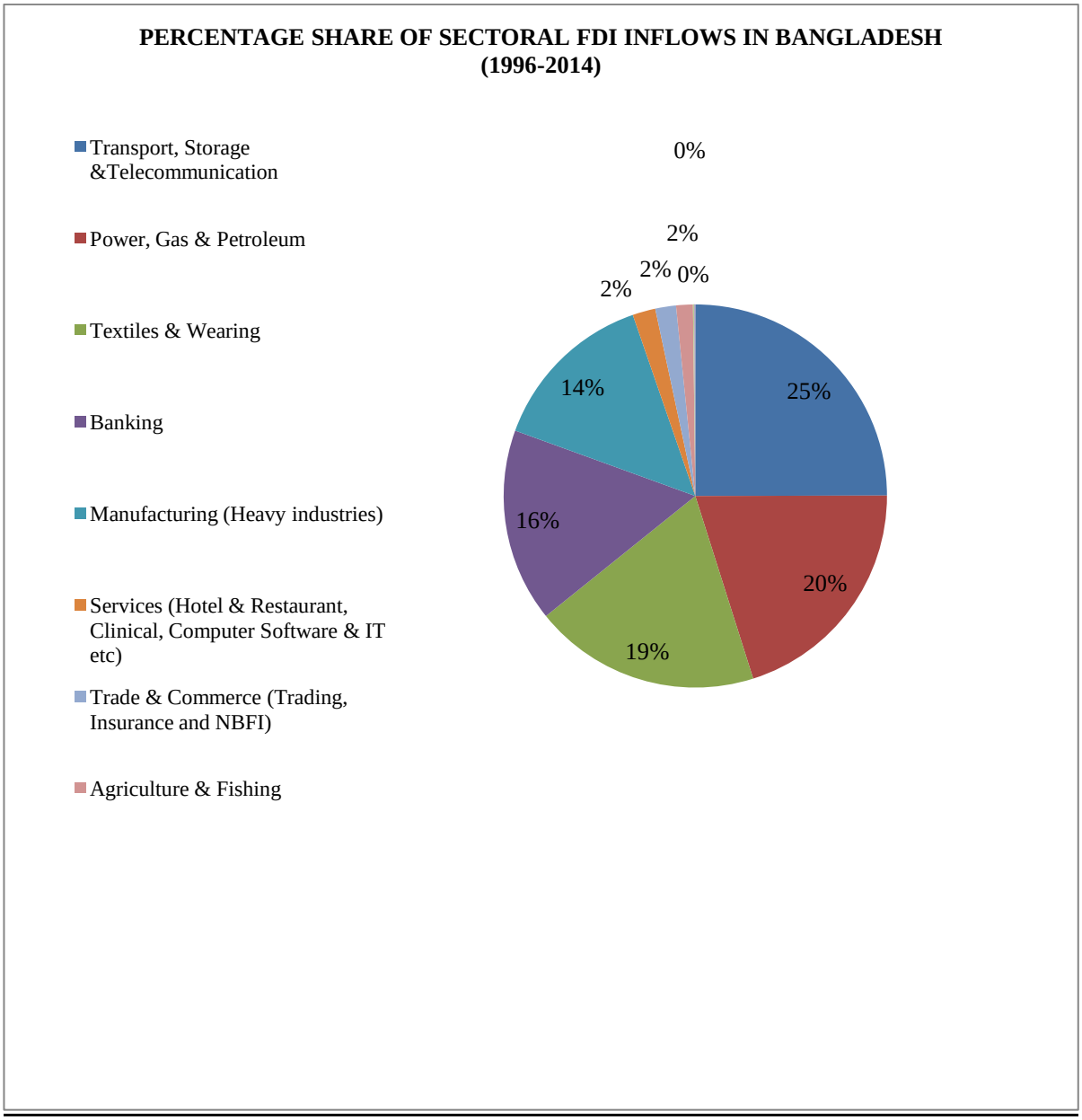
Source: Researcher's contribution based on the data from Department of Industrial Policy and Promotions, Government of India.

Figure I.6: Foreign Direct Investment Inflows Trends in Bangladesh (1996-2014)



Source: Researcher's contribution based on the data from Statistics Department, Bangladesh Bank.

Figure I.7: Percentage Share of Sectoral FDI Inflows in Bangladesh (1996- 2014)



Source: Researcher's contribution based on the data from Statistics Department, Bangladesh Bank

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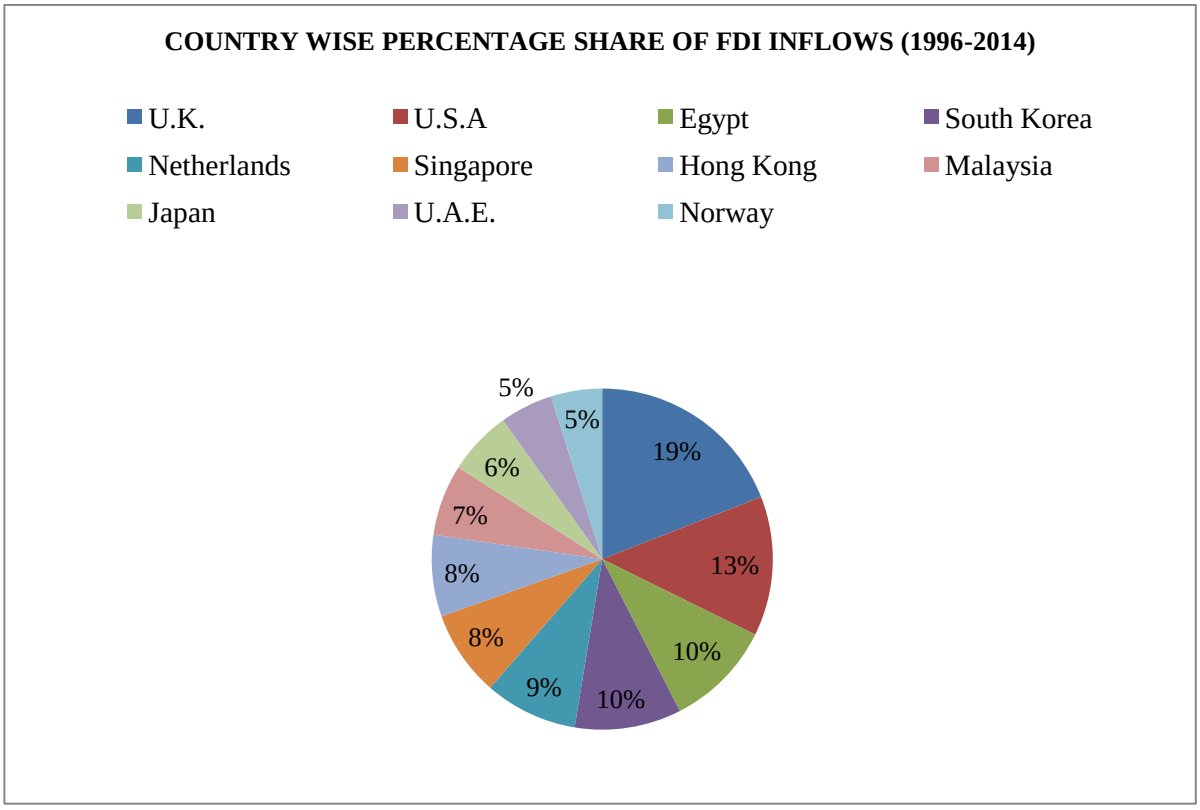
Figure I.8: Country-Wise Percentage Share of FDI Inflows in Bangladesh (1996- 2014)



Source: Researcher's contribution based on the data from Statistics Department, Bangladesh Bank.

APPENDIX II

RESULTS OF CAUSALITY, UNIT ROOT AND COINTEGRATION TESTS: INDIA

Table II.1: Results of Unit Root Test

Results of Unit Root Test for CO_2 (First Difference)

Hypothesis: D($LICO_2$) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.147002	0.0000
Test critical values	1% level		-3.639407	
	5% level		-2.951125	
	10% level		-2.614300	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for Energy Use (First Difference)

Hypothesis: D(LIEnergyuse) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.424545	0.0001
Test critical values:	1% level		-3.639407	
	5% level		-2.951125	
	10% level		-2.614300	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for Exports (First Difference)

Hypothesis: D(LIExport) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.948716	0.0045
Test critical values:	1% level		-3.639407	
	5% level		-2.951125	
	10% level		-2.614300	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for Imports (First Difference)

Hypothesis: D(LIImport) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG =9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.574926	0.0008
Test critical values:	1% level		-3.639407	
	5% level		-2.951125	
	10% level		-2.614300	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for FDI (First Difference)

Hypothesis: D(LIFDI) has a unit root				
Exogenous: Constant				
Lag Length: 5 (Automatic - based on SIC, MAXLAG =9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.470034	0.0001
Test critical values:	1% level		-3.679322	
	5% level		-2.967767	
	10% level		-2.622989	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for GDP (First Difference)

Hypothesis: D(LIGDP) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG =9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-5.179331	0.0002
Test critical values:	1% level		-3.639407	
	5% level		-2.951125	
	10% level		-2.614300	

**MacKinnon (1996) one-sided p-values.*

Table II.2: Results of Cointegrating Relationships between Exports, Import, FDI, GDP, CO_2 and Energy Use

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	5% critical value	Probability**
r = 0*	0.817609	143.8121	95.75366	0.0000
r ≤ 1*	0.681754	87.65913	69.81889	0.0010
r ≤ 2*	0.465259	49.87638	47.85613	0.0319
r ≤ 3	0.442331	29.21928	29.79707	0.0582
test indicates 3 co integrating equation(s) at the 0.05 level.				

** denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values.*

Table II.3: Long Run Error Correction Coefficient of VECM (India)

Variable	Coefficient	t-statistic
LGDP	0.322*	1.75**
LENERGY	0.469*	0.57**
LIMPORTS	0. 635*	2.14**

**denotes significance at the level 1%. **denotes t values.*

Table II.4: Result of the Granger Causality Test

Dependent variable	ΔLFDI	ΔLGDP	Δ LENERGY	ΔLCO_2	ΔLEXPORTS	ΔLIMPORTS
ΔLFDI	------	1.24 (0.30)	0.32(0.72)	0.32(0.72)	2.35 (0.11)	0.04 (0.95)
ΔLGDP	0.16(08.4)	------	3.14 (0.04)**	2.45 (0.10)	1.76(0.19)	0.05 (0.94)
ΔLCO_2	0.38(0.68)	0.60(0.55)	0.61(0.54)	------	0.19(0.82)	0.45(0.63)
ΔLENERGY	0.25(0.77)	1.35(0.27)	------	1.62 (0.21)	1.97(0.15)	4.17 (0.02)**
ΔLEXPORTS	0.26(0.76)	0.11(0.89)	1.25(0.30)	0.53(0.59)	------	1.34 (0.27)
ΔLIMPORTS	0.96(0.39)	0.23 (0.79)	2.64(0.04)**	0.72(0.49)	0.02(0.97)	------

*** Indicate the Rejection of the Null Hypothesis at 5% Level of Significance.*

APPENDIX III

RESULTS OF CAUSALITY, UNIT ROOT AND CO-INTEGRATION TESTS: BANGLADESH

Table III.1: Results of Unit Root Test

Results of Unit Root Test for Energy Use (First Difference)

Hypothesis: D(LBEnergy) has a unit root				
Exogenous: Constant				
Lag Length: 1 (Automatic - based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-7.712533	0.0000
Test critical values:	1% level		-3.653730	
	5% level		-2.957110	
	10% level		-2.617434	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for GDP Growth (First Difference)

Hypothesis: D(LBGDP) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG =9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-6.717333	0.0000
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	
	10% level		-2.615817	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for FDI (First Difference)

Hypothesis: D(LBFDI) has a unit root				
Exogenous: Constant				
Lag Length: 6 (Automatic - based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-4.943119	0.0005
Test critical values:	1% level		-3.699871	
	5% level		-2.976263	
	10% level		-2.627420	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for Imports (First Difference)

Hypothesis: D(LBImport) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG =9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-10.08645	0.0000
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	
	10% level		-2.615817	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for Exports (First Difference)

Hypothesis: D(LBExports) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, MAXLAG=9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-8.968633	0.0000
Test critical values:	1% level		-3.646342	
	5% level		-2.954021	
	10% level		-2.615817	

**MacKinnon (1996) one-sided p-values.*

Results of Unit Root Test for CO_2 (First Difference)

Hypothesis: D($LBCO_2$) has a unit root				
Exogenous: Constant				
Lag Length: 7 (Automatic - based on SIC, MAXLAG =9)				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-3.077020	0.0409
Test critical values:	1% level		-3.711457	
	5% level		-2.981038	
	10% level		-2.629906	

**MacKinnon (1996) one-sided p-values.*

Table III.2: Results of Co integrating Relationships between Exports, Import, FDI, GDP, CO_2 and Energy Use

Hypothesized No. of CE(s)	**Eigen value**	**Trace Statistic**	**5% critical value**	**Probability****
None *	0.832211	218.1255	95.75366	0.0000
At most 1 *	0.820973	161.0040	69.81889	0.0000
At most 2 *	0.678422	105.9569	47.85613	0.0000
At most 3 *	0.592701	69.65240	29.79707	0.0000
At most 4 *	0.499628	40.90972	15.49471	0.0000
At most 5 *	0.443465	18.75283	3.841466	0.0000
test indicates 6 co-integrating equations at the 0.05 level.				

** denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values.*

Table II.3: Long Run Error Correction Coefficient of VECM (Bangladesh)

Variable	**Coefficient**	**t-statistic**
LFDI	1.000	
LEXPORTS	0.335*	0.71**
LIMPORTS	0. 242*	1.14**
LCO_2	0. 41*	0.22**

**denotes significance at the level 1%. **denotes t values.*

Table III.4: Result of the Granger Causality Test

Dependent Variable	**ΔLFDI**	**ΔLGDP**	**ΔLENERGY**	**ΔLCO_2**	**ΔLEXPORTS**	**ΔLIMPORTS**
ΔLFDI	------	1.95 (0.16)	0.27 (0.76)	3.08 (0.04)**	7.03 (0.00)**	0.37 (0.68)
ΔLGDP	0.61 (0.54)	------	0.29 (0.74)	0.00 (0.99)	2.03 (0.15)	0.18 (0.83)
ΔLCO_2	2.01 (0.15)	0.80 (0.45)	0.43 (0.65)	------	2.17 (0.13)	1.35 (0.27)
ΔLENERGY	2.00 (0.15)	0.23 (0.79)	------	0.27 (0.76)	0.91 (0.41)	0.07 (0.93)
ΔLEXPORTS	1.31 (0.28)	0.44 (0.64)	1.29 (0.29)	3.46 (0.04)**	------	1.38 (0.26)
LIMPORTS	.95(0.03)**	0.51 (0.60)	1.21 (0.31)	2.85 (0.05)**	3.15 (0.05)**	------

*Note: ** Indicate the Rejection of the Null Hypothesis at 5% Level of Significance*.