

## CHAPTER III

# EnvironmEntal Pol iciEs and Performance of the sel ected Industries of AssAm

### **3.1 Introduction**

The Environmental Policy and Performance of the selected industries of Assam are discussed, analysed and interpreted in details in this chapter. First section of the chapter deals with Environmental Policies of the selected industrial units of Assam and second section of the chapter deals with Environmental Performance of the selected industrial units of Assam.

### **3.2 Environmental Policies of the selected industries of Assam**

Environmental policy refers to the commitment of an organization to the laws, regulations and other policy mechanisms concerning environmental issues. There is a growing understanding that environmental policy must fit within the company's business strategy (Gallhofer and Haslam, 1997, cited in Asuquo, 2012, p. 171). An Environmental Policy is a key element of an efficient EMS and in the absence of such a policy, only partial environmental management (EM) can be practiced. There are two major types of environmental policies. First, charters that are developed by an outside body and subscribed to by various organisations, and second, those that are developed by the company itself-or 'in-house' policies. The charters tend to include a commitment to sustainable development. In-house policies or popularly known as corporate environmental policies (CEPs) however, may not include such a commitment (Tilt, 1998, p.4). Therefore, Environmental Policies and its proper implementation are considered must for running any industries in India.

In this chapter, Corporate Environmental Policies (CEP) of sample companies under the industry group in Assam is examined in this study. The different environmental policies adopted by major industrial units in Assam are discussed below:

### **Corporate Environmental Policy (CEP)**

<b>Type of industry</b>	<b>Name of industrial units</b>
Oil Refinery	Bongaigoan Refinery Ltd. (BGR), Digboi Refinery Ltd. (DR)
Paper	Hindustan Paper Corporation Ltd. (HPCL)
Coal	Coal India Ltd (CIL)
Petroleum and natural gas	India Carbon Ltd. (ICL)
Plywood	Kitply Industries Ltd. (KIL)
Tea	Goodricke Group of companies (GGC)

### **Health Safety and Environment (HSE) Policy**

<b>Type of industry</b>	<b>Name of industrial units</b>
Oil Refinery	Numaligarh Refinery Ltd. (NRL)
Petrochemicals	Assam Petrochemicals Ltd. (APL)
Petroleum and natural gas	Oil India Ltd. (OIL)
	Oil and Natural Gas Corporation Ltd. (ONGC)
	Assam Gas Company Ltd. (AGCL)
	Assam Carbon Products Ltd. (ACPL)
	Gas Authority of India Ltd. (GAIL)

### **3.2.1 Brief Overview of the environmental policies of the selected industrial units of Assam**

Below is a brief overview of the environmental policies of the selected industrial units of Assam:

#### **3.2.1.1 Fertilizer industry**

Under this industry, Corporate Environmental Policy of Brahmaputra Valley Fertilizer Corporation Ltd. (BVFCL) is discussed in brief below:

- **Brahmaputra Valley Fertilizer Corporation Ltd. (BVFCL)**

Brahmaputra Valley Fertilizer Corporation Ltd. (BVFCL) is totally committed for safeguarding of the environment by implementation of various pollution Abatement Measures and continuous monitoring of the impact levels on water, air and soil. The BVFCL have also committed to control the generation of toxics and wastes from Namrup-III while complying with requisite statutory and legislator requirements by continually monitoring performance and improving plant efficiency through continually improved objectives and targets. The BVFCL strive to improve environmental performance of Namrup-III and around. The commitment includes conservation of natural resources; dissemination of environmental related information; awareness and support to public regarding environmental up gradation (source: Corporate Environmental Policy Statement of the company).

### **3.2.1.2 Oil Refinery**

Under this industry, two units of Indian Oil Corporation Ltd., namely, Digboi Refinery, Bongaigaon Refinery (BGR), and Numaligarh Refinery Ltd. (NRL) were having CEP and HSE policy. These policies are discussed in brief below:

- **Digboi Refinery (DR)**

Digboi Refinery, a unit of Indian Oil Corporation Ltd. (IOCL) will continue effectively to ensure that its operation does not cause any adverse impact on the environment. They are committed to maintain good environment in and around its surroundings having compliance with relevant environmental regulations and laws. They strive for continual improvement in environmental performance and prevention of pollution by adopting state-of-the-art technology and by developing the skills of the employed persons through training. To minimise effluent generation, improve treated effluent quality, reduce solid waste generation and optimise energy consumption (source: Corporate Environmental Policy Statement of company).

- **Bongaigaon Refinery (BGR)**

Bongaigaon Refinery, a unit of Indian Oil Corporation Ltd. (IOCL) is committed to carry out business with strong environment conscience thereby ensuring sustainable development, preservation of ecological balance, safe work places and enrichment of Quality of life of Employees, Customers and the Community and strongly believes that good Quality, Safety, Health and

Environmental performance is an integral part of an efficient and profitable business organisation. They are committed to ensure high standards for Product Quality, Safety and Health of the people, processes and assets also plan, design, operates and maintain the facilities, processes and procedures for ensuring Product, Quality, Safety, Health and Environmental protection. They comply with all Rules, Regulations and Statutes on Quality of products and services, Safety Occupational Health and Environmental protection. Remain equipped and ready for effective and prompt response to accidents and emergencies. Conserve key resources, minimise waste generation and ensure environmentally safe disposal of inevitable waste. Make all efforts to preserve its ecological balance and heritage and feel the customer requirements through timely supply of quality products and services. Inculcate awareness on Quality, Safety, Health and Environment amongst employees, contractors and interested parties. Ensure continual improvement of its Quality, Safety, Health and Environment performance by adopting industry best practices. The company welcome audit of Quality, Safety, Health and Environment Management Systems by external bodies, so that stakeholders' confidence is safeguard (Source: corporate Environmental Policy Statement of company).

- **Numaligarh Refinery Ltd (NRL)**

The Numaligarh Refinery Ltd. (NRL) is complied with all statutory regulations for the benefit of the environment. They consider Health, Safety and Environmental aspects are an integral part of their business planning and operation process. Based on these guiding principles, NRL provides safe facilities and working conditions, recognising that all employees have responsibility for their own safety and actions

which could affect the safety of others, adoption of appropriate technologies to minimise the impact of refinery activities on the Environment. It established clear objectives and targets to improve continuously for prevention of accidents & occupational illnesses and minimising any impact of refinery activities on the environment; Promote learning through training and sharing of experiences and best practices; including values and attitudes conducive to achieve excellence in Health, Safety and Environmental performance. It creates appropriate forums for deliberations on Health, Safety and Environmental issues (source: Health, Safety and Environment Policy Statement of company).

### **3.2.1.3 Petrochemicals**

Under this industry, Assam Petrochemicals Ltd. has Health, Safety and Environment Policy which is discussed in brief below:

- **Assam Petrochemicals Ltd. (APL)**

Assam Petro-Chemical Ltd. (APL) is dedicated to provide a safe and healthy environment for its employees and customers, thereby protecting the public and preserving the company assets & properties as well as the surrounding environment. They are committed to promote and strive for continuous improvement of good health, safety and environment practices; create awareness on health, safety and protection of environment among all levels of employees; total elimination of accidents and significant reduction in numbers of personal injuries; minimize the impact on the environment through pollution control, reduction of natural resources, consumption and emissions and significant

reduction recycling of wastes; identification and elimination of potential hazards at workplace through the use of an effective safety management system; promotion of personal hygiene and communal hygiene in order to reduce the necessity for curative treatment and consequent loss of man-days. The commitments listed are in addition to their basic obligation to comply with all other applicable laws and regulations (source: Health, Safety and Environment Policy Statement of the company).

#### **3.2.1.4 Paper industry**

Under this industry, Corporate Environmental Policy of Cachar Paper Mill, a unit of HPCL is discussed in brief:

- **Hindustan Paper Corporation Ltd. (HPCL), Cachar Paper Mill**

Hindustan Paper Corporation Ltd. (HPCL), Cachar Paper Mill is committed to adopt an environment friendly approach in all activities related to its products and services. It ensures compliance of all relevant legislative enactments, statutory regulation and orders, evolve eco-awareness amongst its members, minimise the use of non-biodegradable substances, upgrade process controls and operating practice to contain and counter pollutants at source, reduce the consumption of natural resources especially fibre, fossil, fuel, water and energy through conscious efforts to re-use and re-cycle wherever possible; promote compensatory afforestation through community initiatives to reciprocate the gift of virgin fire; Disseminate information through frequent exchange and interaction with internal and external constituents on the progress in implementation of Environmental



Management Plans (EMPs) (source: Corporate Environmental Policy Statement of the company).

### **3.2.1.5 Coal**

Coal industry has only one industrial unit, i.e., North Eastern Coal Fields in Assam. The Corporate Environmental Policy of Coal India Ltd. is discussed in brief below:

- **Coal India Ltd. (CIL)**

Coal India Ltd. (CIL) affirms its commitment for environment friendly mining with right mitigation of pollution, reclamation of the degraded land, preservation of biodiversity and proper disposal of waste following the best environmental practices including judicious use of the non-renewable energy of the path of continual improvement. Coal India Ltd conducts mining and associated operation in an environmentally responsible manner to comply with applicable laws and other requirements related to environmental aspects. They designed their projects with due consideration of sustainable development. Policies are made to prevent pollution of surrounding habitation by continuous monitoring and adopting suitable measures for environmental protection. They implement environmental management plans for all mines effectively to mitigate pollution on air, water and noise, reclamation of degraded land and proper disposal of wastes, strive to conserve biodiversity, conserve natural resource through recycling of wastes on the principle of REDUCE, RECYCLE and REUSE, strive for continual improvement in environmental performances by setting targets, measuring progress and taking

corrective action. The creation of environmental awareness among the employees and the local communities through pro-active communication and training is also a part of their environmental policies (source: Corporate Environmental Policy Statement of company).

### **3.2.1.6 Petroleum and Natural Gas**

Under this industry, Corporate Environmental Policy and Health, Safety and Environment Policy of six sample units are discussed below:

- **Oil India Limited (OIL)**

Oil India Limited is guided by its Core purpose of 'being a fastest growing energy company with global presence and providing value to all stakeholders. In alignment with the core purpose, OIL is deeply committed to the Preservation of Environment & Ecology, Sustainable Development, enrichment of the quality of life of employees, customers and the community around its operational areas. In pursuance of the above mentioned policy. OIL is committed to: ensure an environment friendly work place in all operations; comply with relevant environmental laws and regulations in OIL's operations, prescribed by the statutory bodies; follow a systematic approach to Environmental Management Plan in order to achieve continual performance improvement; Adopt technologies that conserve energy, prevent pollution, maximize recycling, reduce wastes, discharge and emissions; develop green belts and plant trees in and around OIL's operational areas in harmony with nature; protect aesthetic, cultural, social patterns and historical characteristics in and around OIL's operational areas; promote a culture

among OIL employees, contractors and all the stake holders associated with OIL for shared responsibility towards environmental protection; promote and nurture a healthy, safe & productive environment in its area of operations (source: Health, Safety and Environment Policy Statement of the company).

- **Oil and Natural Gas Corporation Ltd. (ONGC)**

Oil and Natural Gas Corporation Ltd (ONGC) is committed towards HSE issues and has developed Environmental Management System (EMS) based on ISO 14001 at each operating facility which is further integrated with Quality, Occupational Health and Safety management System and is periodically audited by Corporate/ Sectoral HSE and reviewed by top management for continual improvement. The company tackle emergency and disastrous situation by preparing Emergency Response Plan at Installation level and there is Disaster Management Plan at Asset level. ONGC is also joining the pool of oil companies to set up Tier-I facility at Mumbai Port Trust for combating oil pollution. As an innovative solution, bio-remediation technology has been extensively and effectively used for treating oil contaminated soil within installations. ONGC has associated with TERI for implementation of this technology and Oil Zappers technology developed by them has been applied for bio-remediation oil contaminated soil and oily sludge. The company has demonstrated its commitment for environmental protection by undertaking extensive mangrove plantation for marine environmental protection. In accordance with International guidelines and GOI's commitment, ONGC has initiated phasing out Halon Fire Suppression system by 2010 and replacing it with environmental friendly substitute. ONGC

committed to promote and develop renewable energy resources. In addition to plantation in ONGC operational areas extensive tree plantation job has been entrusted to Uttranchal Bamboo and Fibre Development Board (UBFDB), an autonomous body of State Government of Uttrakhand, in eco sensitive areas of Upper Himalayas complementing the objective of National Action Plan of Govt. of India. 3, 00,000 ringal plants have been planted in 120 areas of upper Himalayan region (source: official website of the company).

- **India Carbon Ltd. (ICL)**

India Carbon Ltd. (ICL) is committed to adopt environment friendly practices and requisite pollution control systems. They are committed to adopt natural resource conservation while maintaining compliance of legal requirements. The company shall also strive to continually improve our Environmental Management System Performance (Source: Corporate Environmental Policy Statement of company).

- **Assam Gas Company Ltd. (AGCL)**

The Assam Gas Company Ltd (AGCL) is engaged in transporting natural gas to industrial, commercial and domestic consumers for use as energy source and raw material. They are committed to maintain continual improvement in Health, Safety and Environment (HSE) management along with good performance and zero accident goals. To achieve this, they adopt and maintain high level of safety by safe work practices and latest technology, promote environmental awareness by considering eco friendly approach, comply with all environmental awareness by

considering eco friendly approach, educate their employees in respect of Health, Safety and Environment by giving adequate training periodically, to protect employees in their employment from risks resulting from factors adverse to health. AGCL shall fulfil its commitments to society, to minimize and manage levels of pollution, waste and emission (source: Health, Safety and Environment Policy Statement of the company).

- **Assam Carbon Products Ltd. (ACPL)**

Assam Carbon Products Limited shall be committed to create and maintain a safe and healthy work environment at all sites. The company shall ensure and review applicable statutory and regulatory compliances to its business operations at all sites pertaining to Environmental and Occupational Health & Safety and to carry out its operations in such a manner to avoid unacceptable risks to human Health & Safety. They are also committed to minimize the environmental impact on previous, current and likely future operations and to supply product that will not present any unacceptable risk to human health, safety and environment when used in compliance with product safety communications and common safety practices. The company also monitor regularly Environmental and Health & Safety performance and strive to improve continuously and train employees and contractors in relevant Environmental and Health & Safety matter. They also encourage their business partners to adopt the same accountability. In order to ensure that the above key principles are followed effectively, the company shall conduct periodic management reviews of its Environmental and Health & Safety Management System (source: official website of Assam Carbon Products Ltd.).

- **Gas Authority of India Ltd. (GAIL), LPG Plant**

Gas Authority of India Ltd. (GAIL), Lakwa is committed to conduct business with a robust and integrated Health, Safety and Environment (HSE) Management System having focus on improving harmony with the environment through sustainable development. Safety and Health of everyone who work for GAIL (India) Limited is of paramount importance and these attributes are embedded within core organizational values. GAIL (India) Limited, Lakwa accords highest priority to Health, Safety and Environment; best practices to ensure adequate safety of all stakeholders, plants, pipelines, projects and surroundings; effective control programme and deployment of latest technology; Establish, maintain and continually improve fire defense system; Minimize emissions and discharges in the environment and take measures to Reduce, Reuse and recycle all wastes including E-Waste and Bio-Medical Waste. The GAIL (India) Ltd., Lakwa also given priority to Implement Occupational Hygienic measures; Provide Structured on HSE best practices; Set tangible and measureable targets for monitoring the performance of HSE Management System and conduct periodic Health, Safety and Environment audits to ensure the effectiveness and continual improvement of HSE System. The employees of GAIL (India) Ltd., Lakwa are strongly encouraged to adopt safe working culture and behaviour to ensure effective implementation on the HSE Policy (source: Corporate Environmental Policy Statement of the company).

### **3.2.1.7 Plywood**

Under this industry, the Corporate Environmental Policy of Kitply Industries Ltd. is discussed in brief below:

- **Kitply Industries Ltd. (KIL)**

The Kitply Industries Ltd. (KIL) takes initiatives to restore and maintain the balance in our ecology. They give preference to work in harmony with nature, safeguarding the earth's beauty for the present and future generations. They are committed to the preservation and improvement of the environment, and are always working on new ways to realize this goal. As part of its commitment to a green and vibrant environment, Kitply Industries has been dedicated to the research and development of ecological products to contribute to the conservation of the latter. Through its endeavours to develop more effective ways and methods to conserve natural resources, the Kitply Industries is determined to fulfil its responsibility of beautifying and protecting the natural ambience by enhancing the awareness of its employees. They conserve energy and resources in all their activities. They promote the development of products and technologies that minimize environmental impact, while at the same time taking into account the maintenance of people's safety and health. In their policy, strive to safeguard the safety and health of local citizens and employees is also mentioned (source: Corporate Environmental Policy Statement of the company).

### **3.2.1.8 Tea**

Under this industry, Corporate Environmental Policy of Goodricke Group Ltd. is discussed in brief below:

- **Goodricke Group Ltd. (GGL)**

Goodricke Group Ltd. (GGL) is committed towards protecting its environment and conservation of its ecosystem, by creating awareness amongst all its employees for initiating and implementing the various conservation measures. The company intends to achieve this awareness through continuous training and participation, by use of signboards at workplaces, labour lines and displays in the notice board (source: Corporate Environmental Policy Statement of the company).

The above sample companies discussed their CEP in details. The other remaining companies mentioned their CEP in brief and some of them did not mention anything whether they were having CEP or not.

### 3.2.2 Analysis of Corporate Environmental Policy (CEPs)

For convenience, the industries and the industrial units under study have been coded and given in **Appendix V**. Table 3.1 represents number of industrial units disclosed CEP by sample industrial units of Assam under the industry groups:

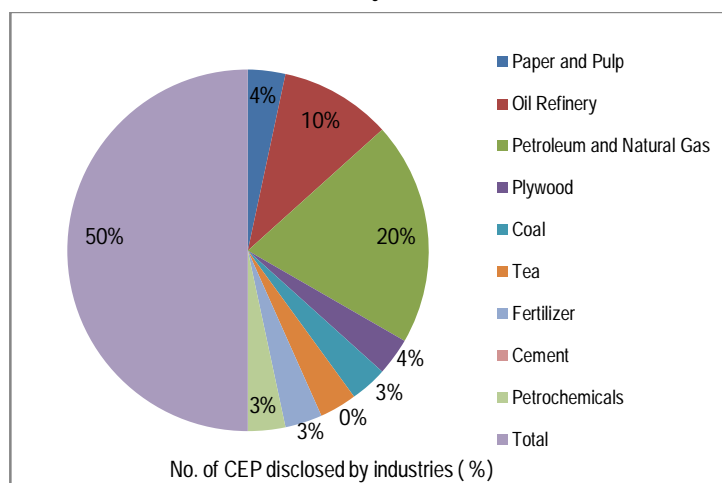
**Table 3.1: No. of CEP disclosed by the selected industries in Assam**

Industry	No. of industrial units	No. of CEP disclosed by industrial units	% of total
A	3	0	0
B	1	1	6.67
C	4	3	20.00
D	2	1	6.67
E	1	1	6.67
G	1	1	6.67
H	6	6	40.00
I	2	1	6.67
J	6	1	6.67
Total	26	15	100

*Source:* Compiled by researcher



**Figure 3.1: No. of CEP disclosed by selected industries in Assam (%)**



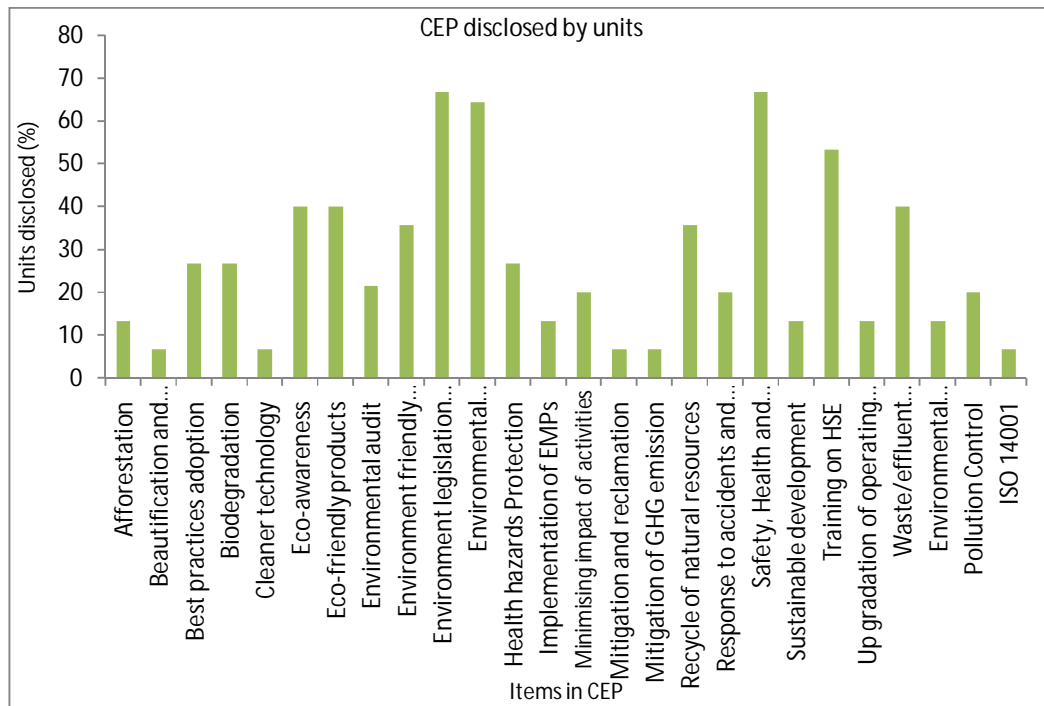
**Table 3.2: No. of items disclosed in CEP by sample units (%) of Assam**

Sl. No	Items in CEP	Units disclosed	Units disclosed (%)
1	Afforestation	2	13.33
2	Beautification and protection	1	6.67
3	Best practices adoption	4	26.67
4	Biodegradation	4	26.67
5	Cleaner technology	1	6.67
6	Eco-awareness	6	40.00
7	Eco-friendly products	6	40.00
8	Environmental audit	3	21.43
9	Environment friendly technologies	5	35.71
10	Environment legislation and regulation	10	66.67
11	Environmental conservation/ Natural Resource conservation	9	64.29
12	Health hazards Protection	4	26.67
13	Implementation of EMPs	2	13.33
14	Minimising impact of activities	3	20.00
15	Mitigation and reclamation	1	6.67
16	Mitigation of GHG emission	1	6.67
17	Recycle of natural resources	5	35.71
18	Response to accidents and emergencies	3	20.00
19	Safety, Health and Environment	10	66.67
20	Sustainable development	2	13.33
21	Training on HSE	8	53.33
22	Up gradation of operating practices/ technology	2	13.33
23	Waste/effluent management	6	40.00
24	Environmental Management System	2	13.33
25	Pollution Control	3	20.00
26	ISO 14001	1	6.67

Source: Adopted from the corporate environmental policies and HSE policies of the above companies

It has been observed from the table 3.2 that the items most often included in a CEP was Safety, Health and Environment and Environment legislation and regulation (66.67%). Environmental conservation/ Natural Resource conservation was mentioned in 64.29% of the CEPs indicating that conservation is a major part of the policies, industry Training and awareness also being included in 53.33% of cases. Waste/effluent management, eco- awareness and eco-friendly products were also among the most often included items.

**Figure 3.2: Showing no. of CEP items disclosed by the sample units (%) of Assam**



**Table 3.3: Descriptive Statistics of environmental policy disclosure of sample units of Assam**

No of observation	26
Mean	4
Standard Deviation	2.80
Maximum	10
Minimum	1
Range	9

Table 3.3 provides descriptive statistics of reporting score for the sample units of Assam. The reporting score of 15 industrial units has a mean value of 4 and standard deviation is 2.80. Their reporting score ranged from 1 to 10 points indicating a medium variation in the disclosure level of corporate environmental information in Assam.

### 3.2.3 Analysis of words and sentences in CEP by industry

In general the size of CEPs varied from a few short sentences, to a booklet containing 59 sentences. Most CEPs were approximately one A4 page and contained a general statement of policy following by a series of specific aims or objectives. Few contained pictures or graphs, and almost none included any monetary or quantitative information, concentrating mainly on narrative text (Tilt, 1998, p.19). The maximum words and sentences used by one sample company of J (Tea) industry and its mean number of words and sentences was 836 and 37 shown in Table 3.4.

**Table 3.4: Mean words and sentences in CEPs by Industry (N = 15)**

Industry	No. of CEP disclosed by industry	% of total	Mean size of CEP (no. of words)	Mean size of CEP (no. of sentences)
A	0	0	0	0
B	1	6.67	63	4
C	3	20.00	178.67	10.67
D	1	6.67	100	6
E	1	6.67	108	8
G	1	6.67	197	10
H	6	40.00	170.50	8
I	1	6.67	93	4
J	1	6.67	836	37
Total	15	100	-	-

From the table 3.5 below, it has been observed that J4 (Goodricke Group Ltd.) used 836 words and 37 sentences in CEP. The next company was H2 (Oil and Natural Gas Corporation Ltd. used 413 words and 11 sentences and C3 (Numaligarh Refinery Ltd.) used 271 words and 15 sentences to describe its CEP. It has been observed that large units disclosed more words and sentences as compared to small units.

**Table 3.5: Volume of words and sentences used in CEP by the sample units**

Name of the units	Words	Sentences
B1	63	4
C1, unit 1	113	8
C1, unit 2	152	9
C2	271	15
D1	100	6
E	108	8
G1	197	10
H1	190	11
H2	413	11
H3	29	5
H4	65	4
H5	145	8
H6	181	9
I1	93	4
J4	836	37

*Source:* CEP Statement of the industrial units

### **3.3 Environmental Performance of the selected industries of Assam**

ISO 14031 defines ‘environmental performance’ as the result of an organisation’s management of the environmental aspects of its activities, products

and services. Most of the industries have committed to continuous improvement in all aspects of health, safety and environmental performance and have committed to comply with environmental laws and regulatory standards. For reflecting their commitment to protect the environment, all the industries have made big contributions in environmental performance by adopting environmental sound technologies. The environment concern of major industries has been appropriately shown by their Environmental Management System, which conforms to ISO 14001. Environmental Management System is a structured and systematic process for achieving continuous improvement in environmental performance (Wu, 2003). ISO 14001 standard provides organizations with an effective Environmental Management System to derive the benefits of environmental positioning and public goodwill.

### **3.3.1 Analysis of Environmental Performance of the sample companies in industries through field survey:**

In this study, Environmental Performance is related with Environmental Reporting with the help of primary data. Here schedule and field survey method was used to collect the data. Thirty questions were framed with the help of other related existing literature- questionnaires. Questions were mostly open-end structured to enable the respondents to answer their view independently and other questions were closed-end with yes/ no. Each of these questions is treated as variables/ parameters for fulfilling the objectives of the study. These questions are divided into two categories namely a) Environmental awareness information disclosure and b) Environmental accounting and reporting information disclosure.

**a) Environmental awareness information disclosures:**

Type of wastes company releases

Treatment of wastes: Disposal and Recycle of waste

Waste products pollute most

Clean development mechanism

Waste Management Plan

Complaints received from local community

Compliance with environmental laws

Submission of environmental statement to the State Pollution Control Board

Adoption of environmental policy

Environment Management System & ISO 14001

Having environmental manager

Green technology

**b) Environmental Accounting and Reporting information disclosures:**

Accounting policy

Capital Environmental Expenditure

Revenue Environmental Expenditure

Environmental contingent Liabilities

Environmental Risk Reserve

Environmental Audit

The table 3.6 shows the classification of sample units according to different industry groups:

**Table 3.6: Classification of selected industries and units in Assam**

Industry	No. of sample units	% of Total
A (Cement)	2	15.38
B (Fertilizer)	1	7.692
C (Oil Refinery)	2	15.38
E (Pulp and Paper)	1	7.692
F (Power)	1	7.692
G (Coal)	1	7.692
H (Petroleum And Natural Gas)	3	23.08
I (Plywood)	1	7.692
J (Tea)	1	7.692
Total	13	100.00

*Source:* Field Survey

The above table 3.6 represents classification of 13 industrial units' in industries in Assam. Out of 25 sample units, 13 units have responded the questions in the schedule favourably and the remaining 12 sample units did not respond, despite of visits to their units respectively. Finally, the analysis of corporate environmental performance in Assam is thus based on 13 industrial units which were under 9 industry groups of Assam. Of the above sample companies, 14 (56%) belonged to public sector and the remaining 11 (44%) companies belonged to private sector.

From the schedule obtained from the sample units, an analysis of the responses received from the respondents against specific questions are presented below:

**Questions 1-19 relate to Environmental Awareness information disclosures.**

### **3.3.1.1 Type of Wastes Releases**

It was observed from table 3.7 that the selected industries filled the question on type of wastes release in the required questionnaire and mentioned the following wastes are being released by them:

**Table 3.7: Type of Wastes Releases**

<b>Industry</b>	<b>Type of wastes releases</b>
A (Cement)	Dust
B (Fertilizer)	Solid, liquid and gaseous
C (Oil Refinery)	Solid, liquid and gas, Hazardous oily sludge, spent catalyst, Bio sludge, non-hazardous solid waste
E (Pulp and Paper)	Solid and liquid wastes
F (Power)	Waste water, Solid waste, and Gaseous emission.
G (Coal)	Shaw Dust, Coal Dust Hard Carbonaceous shale, Effluent water
H (Petroleum And Natural Gas)	Oily Sludge, Burnt lubricants, Oil, formation water, Waste water
I (Plywood)	Oily Sludge
J (Tea)	Wood Ash, Coal Waste

*Source:* Field Survey

The above wastes were released by the selected industries of Assam. The responses received from the industries were positive. Apart from one industry, all the other ten industrial units have mentioned the type of wastes released by them.

### **3.3.1.2 Treatment of wastes**

The response relating to the questions regarding disposal and recycling of wastes by the selected companies were analysed in Table 2.



**Table 3.8: On the treatment of wastes, i.e., disposal and recycling**

Items	No. of Companies	% of total
Disposed off	8	61.54
Recycled	2	15.38
Not mentioned	2	15.38
No waste	1	7.69
Total	13	100

Source: Field Survey

From the above analysis in Table 3.8, it was observed that 61.54% disposed the wastes, 15.38% recycle wastes. These wastes were disposed either by dumping or by discharging in the river. Recycling is done by only one industry. Other industries were not recycling their wastes, they only disposed it off.

### 3.3.1.3 Wastes products pollutes most

On the question of which waste products pollutes most by the selected industries, most of them filled in the required questionnaire and mentioned in Table 3.9 that the following wastes products pollutes most:

**Table 3.9: Wastes products pollutes most**

Industry	Wastes products pollutes most
A (Cement)	NA
B (Fertilizer)	Liquid effluent
C (Oil Refinery)	Oily sludge
E (Pulp and Paper)	Solid metallic wastes
F (Power)	Lignin
G (Coal)	Mine effluent water
H (Petroleum And Natural Gas)	Oil spillage and drilling waste, Water
I (Plywood)	Shaw dust and Coal dust
J (Tea)	Coal Ash

Source: Field Survey

The above wastes products were released by the above industries and according to these industries these waste products pollutes most. Only one industry has not mentioned anything about most pollutant wastes products.

#### **3.3.1.4 Developing Clean Development Mechanism (CDM)**

The question regarding developing Clean Development Mechanism (CDM) by the selected companies under the major industry groups is mentioned in Table 3.10.

**Table 3.10: Developing Clean Development Mechanism (CDM)**

<b>Items</b>	<b>No. of companies</b>	<b>% of total</b>
Yes	5	38.46
No	8	61.54
	13	100.00

*Source:* Field Survey

It was found from the above that 38.46% companies developed CDM while 61.54% companies did not develop till now. This is not encouraging.

#### **3.3.1.5 Implementing Waste Management Plan (WMP)**

The response regarding implementing Waste Management Plan is given in Table 3.11.

**Table 3.11: Implementing Waste Management Plan (WMP)**

<b>Items</b>	<b>No. of companies</b>	<b>% of total</b>
Yes	11	84.62
No	2	15.38
	13	100.00

*Source:* Field Survey

From the above analysis regarding the responses towards implementing WMP were very encouraging. 84.62% replied that they have adopted WMP; only two companies did not have any WMP.

#### **3.3.1.6 Submission of Environmental Statement to the State Pollution Control Board (SPCB)**

In response to Question of submission of Environmental Statement to the State Pollution Control Board (SPCB) regularly, all the companies mentioned that they submit fees & E. S. regularly. In replying this question, all the companies answered that they have not been penalised or fined by SPCB for violation of code of conduct during all the five years, i.e., from 2007-08 to 2011-12.

#### **3.3.1.7 Compliance with Environmental laws**

On both the question of compliance with Environmental laws/ Regulations and Section 217(1) (e) of the Companies Act, 1956, it was found that compliance was 100%. This shows that if companies are required by law to publish any vital information relating to the level of environmental management, compliance of the same becomes automatic (Banerjee, 2009, p.92).

#### **3.3.1.8 Complaints received from local community**

In response to the question against complaints received from local community regarding damages caused to the environment due to operations of their business and what preventive measures they have taken.

**Table 3.12: Complaints received from local community**

Items	No. of companies	% of total
Yes	2	15.38
No	11	84.62
	13	100.00

Source: Field Survey

Out of 13 sample companies under the industry group, only 15.38% companies responded that they have received complaints. One company even have taken preventive measures by removing the damages, paid compensation and inducted corrective measures whereas 84.62% companies responded that they had not received any complaints.

### **3.3.1.9 Adoption of environmental policy**

The responses received were 92.31% regarding adoption of environmental policy by the selected industrial units. Only one company does not have any environmental policy. Some of the companies have placed the policy statement in an attractive and innovative way by displaying it in the entrance gate of the companies.

### **3.3.1.10 Adopting EMS in terms of ISO 14001**

The question relating to adoption of EMS in terms of ISO 14001 is given in Table 3.13.

**Table 3.13: Adopting EMS in terms of ISO 14001**

Items	No. of companies	% of total
Yes	9	69.23
No	4	30.77
	13	100.00

Source: Field Survey

From Table 3.13, it was found that 69.23% companies have adopted EMS in terms of ISO 14001 and only 30.77% companies' do not mentioned.

### 3.3.1.11 Obtaining ISO 14001 Certificates

In response to question relating to adoption of ISO 14001 Certificates is given Table 3.14.

**Table 3.14: Obtaining ISO 14001 Certificates**

Items	No. of companies	% of total
Yes	7	53.85
No	6	46.15
Total	13	100.00

*Source:* Field Survey

From Table 3.14, it was observed that 53.85% companies have adopted ISO14001Certificate whereas 46.15% do not adopted.

### 3.3.1.12 Having Environmental Manager

The question regarding having Environmental Manager is given in Table 3.15.

**Table 3.15: Having Environmental Manager**

Items	No. of companies	% of total
Yes	9	69.23
No	4	30.77
	13	100.00

*Source:* Field Survey

From Table 3.15, it was found that 69.23% have an environmental manager and 30.77 do not have any environmental manager.

### 3.3.1.13 Motivating Employees towards EMS

In response to question against measures aimed at Motivating Employees towards EMS, all the sample companies replied 'yes', i.e., 100%.

### 3.3.1.14 Adopting green technology

Question regarding adoption of green technology is given in Table 3.16.

**Table 3.16: Adopting green technology**

Items	No. of companies	% of total
Yes	6	46.15
No	7	53.85
	13	100.00

*Source:* Field Survey

From the analysis of Table 3.16, it was observed that adoption of green technology by the companies was not very encouraging. It was found that only 46.15% have adopted green technology.

### 3.3.1.15 Making capital expenditure for green technology

In response to question relating to making capital expenditure for green technology is given in Table 3.17.

**Table 3.17: Making capital expenditure for green technology**

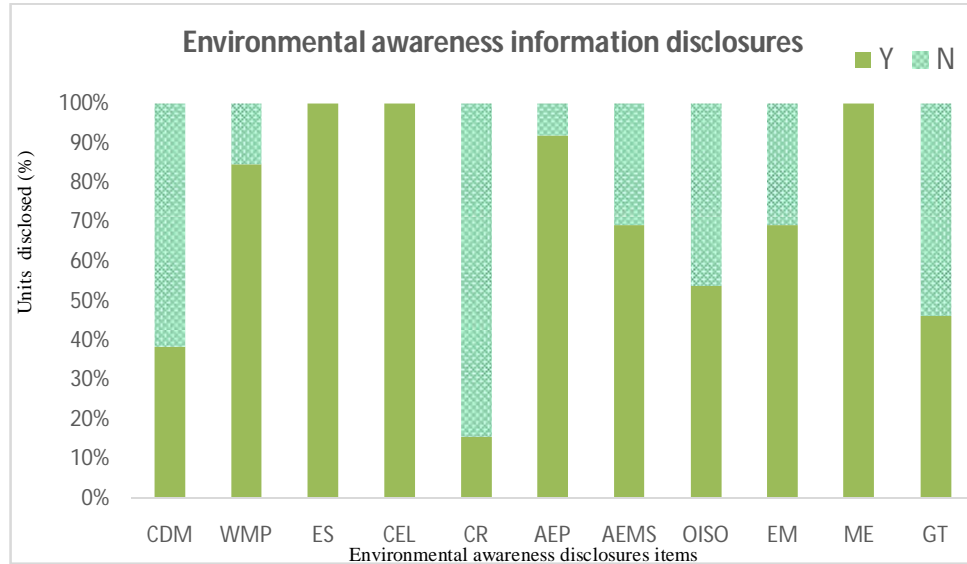
Items	No. of companies	% of total
Yes	3	23.08
No	10	76.92
Total	13	100.00

*Source:* Field Survey

From Table 3.17, only 23.08% make capital expenditure for green technology while 76.92% do not make any expenditure for adoption of green technology.

Figure 3.3 shows environmental awareness information disclosures:

**Figure 3.3: Showing environmental awareness information disclosures**



CDM: Clean Development Mechanism; WMP: Waste Management Plan; ES: Environmental Statement; CEL: Compliance with Environmental laws; CR: Complaints received; AEP: Adoption of environmental policy; AEMS: Adopting EMS; OISO: Obtaining ISO 14001; EM: Environmental Manager; ME: Motivating Employees; GT: Green Technology

Questions 20-30 relate to Environmental Accounting and Reporting information disclosures.

**3.3.1.16 Mentioning accounting policies about measurement and reporting of environment related costs, benefits etc.**

The responses received on question regarding mentioning accounting policies about measurement and reporting of environment related costs, benefits etc. is summarized in Table 3.18.

**Table 3.18: Mentioning accounting policies about measurement and reporting of environment related costs, benefits etc.**

Items	No. of companies	% of total
Yes	9	69.23
No	4	30.77
Total	13	100.00

Source: Field Survey

From the analysis of Table 3.18, 69.23% companies mention about accounting policies about measurement and reporting of environment related costs, benefits etc but 30.77% companies did not response.

### **3.3.1.17 Separate treatment of environment related revenue and capital expenditure**

In response to separate treatment of environment related revenue and capital expenditure is given in Table 3.19.

**Table 3.19: Separate treatment of environment related revenue and capital expenditure**

Items	No. of companies	% of total
Yes	6	46.15
No	7	53.85
Total	13	100.00

Source: Field Survey

From Table 3.19, 53.85% did not mention anything about the separate treatment of environment related revenue and capital expenditure. The responses were discouraging.



### 3.3.1.18 Separate provisions or contingent liabilities for managing environmental risks

Question relating to separate provisions or contingent liabilities for managing environmental risks is given in Table 3.20.

**Table 3.20: Separate provisions or contingent liabilities for managing environmental risks**

Items	No. of companies	% of total
Yes	6	46.15
No	7	53.85
Total	13	100.00

*Source:* Field Survey

From the above, it was found that only 46.15% mentioned against separate provisions or contingent liabilities for managing risks.

### 3.3.1.19 Making Environmental Risk Reserves

In response to question relating to making environmental risk reserves is summarized in Table 3.21.

**Table 3.21: Making Environmental Risk Reserves**

Items	No. of companies	% of total
Yes	6	46.15
No	7	53.85
	13	100.00

*Source:* Field Survey

From Table 3.21, it was found that only 46.15% make Environmental Risk Reserve while 53.85% did not have any Environmental Risk Reserve.

### 3.3.1.20 (a) Adopting Environmental Audit

Question relating to adopting Environmental Audit is given in Table 3.22.

**Table 3.22: Adopting Environmental Audit**

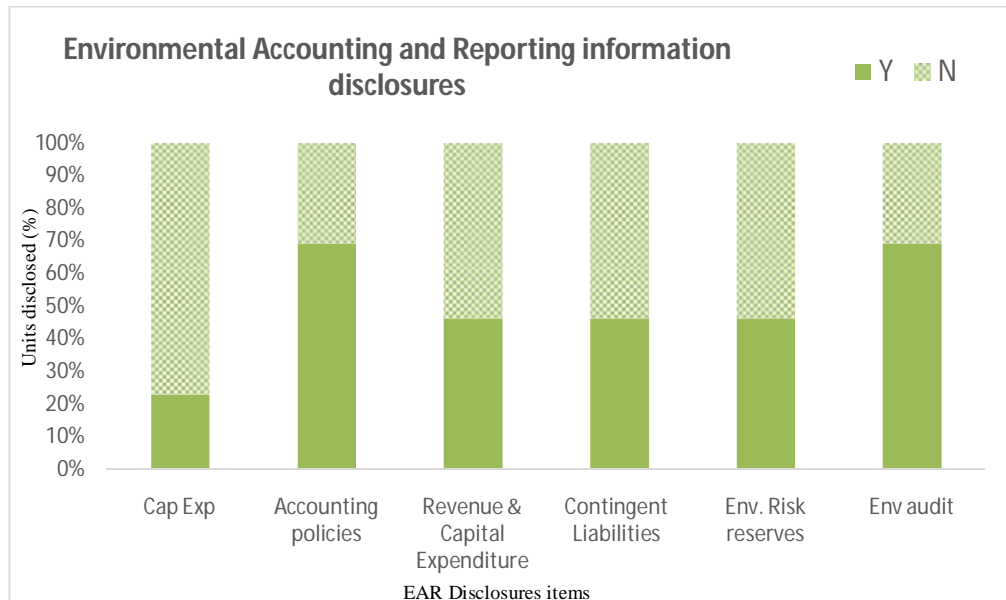
Items	No. of companies	% of total
Yes	9	69.23
No	3	23.08
Not mentioned	1	7.69
Total	13	100.00

Source: Field Survey

In response to adoption of environmental audit by sample companies in Table 3.22, it was found that 69.23% companies have adopted environmental audit, 23.08% do not have environmental audit and 7.69% did not mention anything.

Figure 3.4 shows environmental Accounting and Reporting information disclosures:

**Figure 3.4: Showing Environmental Accounting and Reporting information disclosures**



### 3.3.1.20 (b) Mode of Disclosure of Environmental Audit Report

Question regarding Mode of Disclosure of Environmental Audit Report is given in Table 3.23.

**Table 3.23: Mode of Disclosure of Environmental Audit Report**

Items	No. of companies	% of total
Part of statutory audit report	2	15.38
Separate audit	5	38.46
Both	2	15.38
Not disclosed	4	30.77
Total	13	100.00

Source: Field Survey

It was observed that only 15.38% and 38.46% responded regarding mode of Disclosure of Environmental Audit Report. Others did not disclose regarding environmental audit.

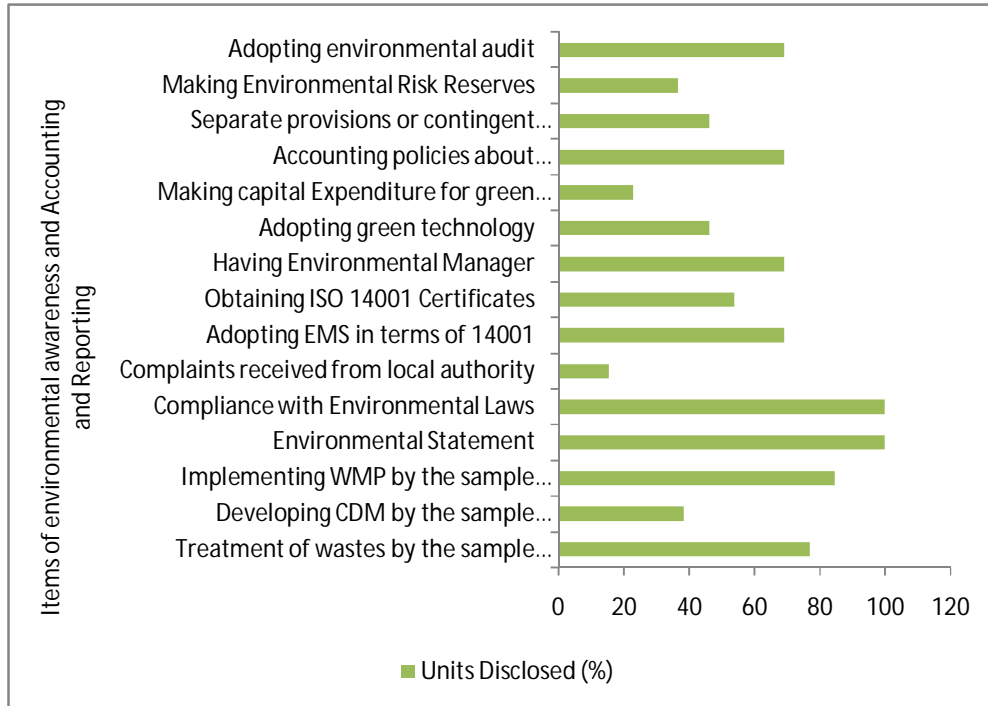
Table 3.24 shows responses received from the respondents were summarized in order to determine the mean and standard deviation.

**Table 3.24: No of items disclosed by selected companies (%) of Assam**

Items	Units Disclosed	Units Disclosed (%)
Treatment of wastes by the sample companies, i.e., disposal and recycling	10	76.93
Developing CDM by the sample companies	5	38.46
Implementing WMP by the sample companies	11	84.62
Environmental Statement	13	100
Compliance with Environmental Laws	13	100
Complaints received from local authority	2	15.38
Adopting EMS in terms of 14001	9	69.23
Obtaining ISO 14001 Certificates	7	53.85
Having Environmental Manager	9	69.23
Adopting green technology	6	46.15
Making capital Expenditure for green technology	3	23.08
Accounting policies about measurement and reporting of environment related costs, benefits etc.	9	69.23
Separate provisions or contingent liabilities for managing environmental risks	6	46.15
Making Environmental Risk Reserves	6	36.63
Adopting environmental audit	9	69.23

Source: Based on above tables

**Figure 3.7: Showing No of items disclosed by sample units (%) of Assam**



**Table 3.25: Descriptive Statistics of mean and S.D. for the sample industrial units of Assam**

No. of companies	13
Mean	7.73
Standard Deviation	3.39
Range	11
Minimum	2
Maximum	13

Table 3.25 provides descriptive statistics for the sample units of Assam. The study reveals that out of 13 companies, the 13 industrial units have a mean value and standard deviation of 7.73 and 3.39 and ranged from 2 to 13 points indicating a medium variation in the disclosure level of corporate environmental information in Assam.