



# Factors Influencing Legal Framework of Environmental Accounting in Indian Industries - Overview and Theoretical Framework

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### ABSTRACT

Indian industries in the context of environmental protection do not have clear policies at the national or industrial level in order to ensure compliance to environmental norms. Thus, there is a growing concern for Indian industry to comply with the environmental reporting with regard to environmental protection. To address this gap, this paper proposes a framework which can be very effective to develop strategies for Indian industries environmental legal framework with regard to environmental protection. Researchers have understood the linkage based on extant literature review which is supported through ISM and MICMAC joined with the inter-relationship between the varied elements. Our study is unique and innovative as we have focused on exploring the different effects of the relationship between environmental accounting, industry and sustainability. The framework proposed in this paper can be utilized to develop strategies towards sustainable development which are focused, practical and effective. The primary challenge of environmental accounting legal framework is the absence of standards in identifying all that needs to be measured and deciding how it is to be measured. The conclusion drawn from the ISM hierarchy shows a high interrelationship and interconnectivity between GRI and CERES for sustainability reporting. Environmental awareness and environmental accounting leads to sustainable reporting.

### INTRODUCTION

Environmental resources utilized, the business involves cost and has an impact on the environment. It is vital for a business entity to be environmentally responsible and to facilitate economic decision making. Change in product process of a firm is the reflection of change in the environment

It is very important for a developing nation like India to come up with incentives and rewards for quality environmental reporting. Stakeholders expect the business entities to meet environmental standards. Companies need to provide an environmental management system to support the same. Indian industry needs to have accounting practices which are conservative and innovative. It is very important to develop future accountants who can measure environmental degradation in quantitative terms. It is a challenge and duty for India to understand the importance of the implementation of environmental accounting in the curriculum. Business should take care of social environmental liabilities. Environmental accounting is an effective tool in order to place the environmental related issues resolutely before the top management, to provide valuable data to inform environmental and financial managers' decision making process, and to demonstrate environmental commitment of the company to its stakeholders. Disclosing en-

vironmental issues in the financial statements enhances the product image and higher sales and finally profitability, it results in higher productivity of factors of production, they enjoy a competitive advantage as the customers may prefer environmental friendly products and services. The success of a business is determined by its environmental performance.

In India, environmental accounting is in the initial stage. Environmental related disclosures are done on a periodic basis after the new economic reforms. After adopting the new economic policy in the country measures on environmental conservation have been taken. In 2011, the Securities and Exchange Board of India mandates listed companies to report on environmental, social and governance (ESG) initiatives undertaken by them for social, environmental and economic responsibilities of business.

The Companies Act 2013 emphasizes on corporate social responsibility that makes it mandatory. It provides that the companies need to make disclosures besides company's general state of affair and financial performance regarding conservation of energy and environmental protection.

Environmental accounting suffers with certain limitations like lack of economic value, no standard method of finding the social value of goods and services from envi-

ronment perspective. Environmental accounting has got no accounting standard. Environmental accounting has a legal obligation for a few industries in India and the industry data available are not reliable.

**The Legal and Regulatory Framework for Environmental Protection in Indian Industries**

Ministry of Environment & Forest, Government of India (GOI) has taken a number of regulatory and non-regulatory initiatives for protecting environment and economic development. In the year 1991, GOI focused on the need for environmental disclosure in annual reports. Institute of Chartered Accountant of India (ICAI) has issued guidelines for financial accounting and reporting and its mandate to follow Companies Act for preparation of annual reports (Chatterjee 2008). Benefits of environmental reporting are given vital importance by the companies (Pramanik et al. 2007). Environmental disclosure is not as simple as it looks, it is more of governance issue (Parker 1997). Credibility in reporting should be based on the analysis of content of annual reports. Nasir Zameer Qureshi et al. (2012) discussed the environmental accounting and reporting as an indispensable component for determining a business strategy and for producing performance reports. Generation of reports and standards for regulatory purpose is a must according to Malarvizhi & Yadav (2008). India’s national accounts and green economic development should be measured with the depletion of natural resources and cost of pollution in the future (IUCN Green Accounting Initiative & Hecht Joy E. 1997). In the natural environment of the economy, environmental accounting can play a major role for economic development (Banerjee 2001).

Present performance in relation to sustainability should be emphasized in reports. Organization’s economic, environmental, social impact can change the stakeholders’ perspective (Smith 2014). In India, the union ministry of environment coordinates between the ministries and States for environment protection and anti pollution measures. As per the latest Companies Act 2013, a lot of significance is given to green initiatives and different laws pertaining to environmental protection in the country. Not only this is one of the current development, but is also the increase of judicial activism for enforcing environmental legislation. The number of public litigation cases reflecting growth of environment has increased. The laws that directly and indirectly relate to environmental protection are given in Table 1

**THEORETICAL BACKGROUND**

**Environmental Awareness (VI)**

Efforts toward environment cautiousness of Indian compa-

nies are immense. India is the leading country to practice more of voluntary green performance reporting and accountability of handing over a green future to our next generations (Davies & Mullin 2011).

Environmental performance can be improved by increasing the awareness and making environmental related cost to zero level (Namakonzi & Inanga 2014). Murty & Kumar (2002), examined in India that the emphasis on reporting aspects of environment is very limited. In simple words, environmental accounting talks all about making environment costs more transparent with reporting. In the early 1970s, Norway was the first to adopt environmental accounting. After abolishing industrial licensing, environmental clearance has taken central stage (Jasch 2003). Industries consume environmental resources for their manufacturing process. This results in environment pollution and degradation. Environmentalism is increasing rapidly at the global level. One outcome is development of different disciplines progressing sustainable development like sustainability science (Bebbington & Larrinaga 2014). Globally, environmental protection and anti pollution measures are a major concern (Goodland 2002).

Malik & Mittal (2015) suggested that organization must try to find out the variance between the standard and actual environmental performance. They also emphasized on stressing environmental impact on the financial performance. Environmental consciousness has become an integral part of Indian industry leading to environmental quality and growth. Currently environmental legislations serve some purpose of protecting the environment, the enterprises have significant differences in the way they approach environ-

Table 1: Laws directly and indirectly related to environmental protection.

Directly Related to environmental protection	Indirectly related to environmental protection
(i) Water (Prevention and Control of Pollution) Act, 1974	(i) The provision in the Constitution (Article 51A)
(ii) Water (Prevention and Control of Pollution) Cess Act, 1977	(ii) The Factories Act, 1948
(iii) Air (Prevention and Control of Pollution) Act, 1981	(iii) Hazardous Waste (Management and Handling) Rules, 1989
(iv) The Forest Conservation Act, 1980	(iv) Public Liability Insurance Act, 1991
(v) The Environment (Protection) Act, 1986	(v) The Motor Vehicle Act, 1991
	(vi) Indian Penal Code
	(vii) The National Environment Tribunal Act, 1995
	(viii) Indian Fisheries Act, 1987

mental issues (D'Souza & Peretiatko 2002).

### **Green Accounting (V2)**

The term “green accounting” or “environmental accounting” has now been researched abundantly. Green accounting highlights green domestic product without ignoring the environment. It is a type of accounting that attempts to analyse environmental costs into the economic results of operations. Gray (2006, 2010) spoke about the sustainability aspect of accounting which must reveal the right information to the stakeholders. Environmental accounting includes economic, social, and environmental aspects (Ball 2005, Hackston 1996). Researchers have conducted studies to evaluate the financial and sustainable impact on financial management (Lamberton 2005, Schaltegger & Wagner 2006, Taplin et al. 2006). The main emphasis of the many studies has been to present the overview scenario of this emerging area. Theoretically, the environmental concern remains rare and the economic performance is ascertained through environment management accounting (Christ & Burritt 2013). It is expected that Indian companies should report their environmental performance. However, developing countries need to pay more attention to the state of environmental accounting (Ahmed & Sulaiman 2004, Thompson & Zakaria 2004, Nafez & Kamal 2000). Pahuja (2009) concluded that companies which have better environmental performance provide more environmental information in the annual reports as compared to poor performers. Greener environment practices and its evaluation through accounting and reporting needs to be the business strategy (Jankovic & Krivaèic 2014).

### **CERES (Coalition for Environmental Responsible Economies) (V3)**

Environmental problem is a global phenomenon and has a negative impact on the quality of our life. Initiatives are taken both at the national and international level to decrease, avoid and reduce its impact on social, economic and political spheres. The emergence of corporate environmental reporting (CER) in India has been an important development, both for better environmental management and overall corporate governance.

The Ceres Coalition comprises of more than 130 institutional and socially responsible investors, environmental and social advocacy groups and other public interest organizations. The Ceres Coalition works to promote sustainability by moving companies, policy makers and other market players to incorporate environmental and social factors into their decision-making and to mobilize investor and business leadership to build a thriving, sustainable global economy.

Present and the next generation need to focus on sustainability (Sen 2013). The global agenda discussed by the World Commission on environment and development was to create environmental awareness in the entire world. Environmental problems to a great extent are related to product and production process (Tukker & Jansen 2006). Nowadays the national government has started intervening to raise environmental issues and not just relying on voluntary mechanisms (Vogel 2005, Hay et al. 2004). Further, Kordestani et al. (2015) has briefly summarized research areas towards developing sustainability. Also sustainability economics is subservient to society, was proposed by Manners (2014). The concept of sustainability is important for all stakeholders, who take and implement the concept of sustainability in different stakes.

### **GRI (Green Reporting Initiatives) (V4)**

The Global Reporting Initiative (GRI) was established in late 1997 with the mission of designing globally applicable guidelines for preparing enterprise-level sustainability reports. These guidelines, presented as an exposure draft for comment and pilot testing, are the GRI's first major product. The GRI is convened by CERES (Coalition for Environmentally Responsible Economies) and incorporates the active participation of corporations, non-governmental organisations (NGOs), consultants, accountancy organisations, business associations, universities and other stakeholders from around the world. The GRI seeks to establish a common framework for enterprise-level reporting on the linked aspects of sustainability: the environmental, the economic and the social. Rush & Roy (2000) observed that companies giving environment disclosure in the public sector were more than in the private sector. The GRI standards for sustainability reporting are now the most reliable and widely practiced in the world. GRI's standards assist businesses, governments and other organizations to study and evaluate the impact of business on sustainability issues. Some of the important elements of the GRI standards consist of multi-stakeholder input, a record of use and endorsement, governmental references and activities independence and shared development costs.

Very few corporations give adequate information regarding environmental issue. If, as per the requirement of applicable law, they have to prepare and submit any information relevant to environment, they do so. The pursuit of ‘green’ initiatives by Indian firms is for ensuring environmental compliance (in terms of environmental performance indicators of the GRI G1(2000), GRI G2 (2002), and GRI G3 (2006) guidelines and for securing a competitive edge (in terms of higher profitability, improved market share. GRI G1 = Global Reporting initiative's Generation 1 guidelines intro-

Table 2: Structural self interaction matrix.

i j ↓ →	V5	V4	V3	V2	V1
V1	V	V	X	V	
V2	X	X	V		
V3	X	X			
V4	X				
V5					

duced in 2000. GRI G2= GRI’s Generation 2 guidelines introduced in 2002; G3 Guidelines are Generation 3 Guidelines introduced in 2006. Very few companies have reported as per GRI. Pradhan & Bal (2002) agreed that a company must reveal information about environmental policy, environmental audit report and future targets. Regular attempts have been made in this regard in different countries to streamline the environmental reporting practices for industry.

An effective sustainability reporting cycle, which includes a regular program of data collection, communication, and responses, should benefit all reporting organizations, both internally and externally.

**Sustainability Reporting(V5)**

Shediac-Rizkallah & Bone (1998) defined sustainability as a continuous and a constant process existing in various forms but no focus is on evaluation for the same. The purpose of sustainability in industrial growth and green practices is mandatory. Positive environmental influence is the real improvement which can lead to environment friendly production processes, products and services. Environment is comprehensively the whole ecosystem of living organisms and the non living components around us. Voluntary environmental accounting and reporting has changed the way, how the tradition corporations tend to think on their corporate social responsibility (CSR) (Pahuja 2009). Natural Capital Accounting (NCA) is the measurement and valuation of nature’s benefits in terms of ecosystems, goods and services-like freshwater, flood control and forest products to be incorporated into a general standard format consistent with conventional national accounts. Environmental accounting thus plays an important role in this regard and is now gaining importance in the reporting function of an organization.

Global efforts on EIA (Environmental Impact Assessment) must go beyond measurement of air, water pollution etc. to ultimately augment improved quality of life in future. Environmental friendly programs and practices such as conservation of non-renewable energy sources, greening, reclamation and rehabilitation, afforestation, top soil management, noise abatement and vibration analysis, general

Table 3: Reachability matrix.

i j ↓ →	V1	V2	V3	V4	V5	Driving Variables
V1	1	1	1	1	1	5
V2	0	1	1	1	1	4
V3	1	0	1	1	1	4
V4	0	1	1	1	1	4
V5	0	1	1	1	1	4
Dependent Variable	2	4	5	5	5	

aesthetic beauty etc., have resulted in better efficiency and improved environmental performance.

**RESEARCH METHODOLOGY**

The study is based on primary data collected from different sources. The researchers have conducted an extensive literature review by reviewing articles from Ebsco, Emerald, Scopus, Jstor, Thomson Reuters and Google Scholar. In this study, the researchers have opted for systematic literature review (SLR) which was proposed by Tranfield in 2003. This approach has helped the researchers to understand the key dimensions derived from SLR. To understand the relationship among the various variables, isometric modeling technique (ISM) proposed by Warfield in 1973 is used. This model is further analyzed using MIC MAC analysis. Synthesis of review identified research gaps, it was noticed that currently limited work has been done in the area of factors influencing legal framework of environmental accounting in Indian industries. The research will make an attempt to close the visible academic gap.

**Structural Self Interaction Matrix (SSIM)**

To analyze the variables, a contextual relationship of ‘leads to’ or ‘influences’ was chosen. On the basis of this, a contextual relationship between the identified variables is developed (Table 2)

1. If the (i, j) entry based on expert opinion in the SSIM is V, then the (i, j) entry in the reachability matrix is assigned the value of 1 while the reverse (j, i) entry becomes 0;
2. If the (i, j) entry based on expert opinion in the SSIM is A, then the (i, j) entry in the reachability matrix is assigned the value of 0 while the reverse (j, i) entry becomes 1;
3. If the (i, j) entry based on expert opinion in the SSIM is X, then the (i, j) entry in the reachability matrix is assigned the value of 1 while the reverse (j, i) entry also becomes 1.
4. If the (i, j) entry based on expert opinion in the SSIM is O, then the (i, j) entry in the reachability matrix is assigned the value of 0 while the (j, i) entry also becomes 0.

Table 4: Level partitioning level 1.

i j ↓ →	Reachability Set	Antecedent Set	RS $\curvearrowright$ AS	Level
V1	1,2,3,4,5	1,3	1,3	
V2	2,3,4,5	1,2,4,5	2,4,5	
V3	1,3,4,5	1,2,3,4,5	1,3,4,5	
V4	2,3,4,5	1,2,3,4,5	2,3,4,5	Level 1
V5	2,3,4,5	1,2,3,4,5	2,3,4,5	Level 1

**Reachability Matrix**

As shown in Table 3, the SSIM has been converted into a binary matrix, i.e., the reachability matrix by substituting V, A, X and O by 1 and 0. For better understanding we have presented the guideline for translating V, A, X, and O into binary digits as:

- If the (i, j) entry in the SSIM is V, the (i, j) entry in the reachability matrix becomes 1 and the (j, i) entry becomes 0;
- If the (i, j) entry in the SSIM is A, the (i, j) entry in the reachability matrix becomes 0 and the (j, i) entry becomes 1;
- If the (i, j) entry in the SSIM is X, the (i, j) entry in the reachability matrix becomes 1 and the (j, i) entry also becomes 1; and
- If the (i, j) entry in the SSIM is O, the (i, j) entry in the reachability matrix becomes 0 and the (j, i) entry also becomes 0.

After checking the transitivity property, the initial reachability matrix was translated into final reachability matrix. From the final reachability matrix, the reachability and antecedent set for each variable was found (Tables 4 & 5).

Thus from Tables 4 and 5 the levels mentioned in Table 6 have been arrived at for building up the model.

Fig. 1 shows that green reporting initiatives and sustainability reporting emerges as the starting point for the model. There exists a direct relation between green reporting initiatives and sustainability reporting with CERES.

Table 6: Level wise variables.

Level	Nomenclature	Variable
1	GRI (green reporting initiatives)	V4
1	Sustainability reporting	V5
2	Environmental Awareness	V1
2	CERES (Coalition for environmental responsible economies)	V3
3	Green accounting	V2

Table 5: Level partitioning level 2 & 3.

i j ↓ →	Reachability Set	Antecedent Set	RS $\curvearrowright$ AS	Level
V1	1,2,3	1,3	1,3	Level 2
V2	2,3	1,2	2	Level 3
V3	1,3	1,2,3	1,3	Level 2

When combined with environmental accounting and regulatory framework developing a sense of environmentalism amongst industries can sustain the growth of economy and industry.

**MICMAC Analysis**

Fig. 2 depicts the objective of MICMAC analysis is to analyze the driving power and dependence of the variables. Based on the driving power and dependence, the factors have been classified into four clusters as:

Cluster 1: Autonomous variables- These factors have a weak drive power and weak dependence.

Cluster 2: Dependence variables- These factors have a weak drive power but strong dependence.

Cluster 3: Linkage variables- These factors have a strong drive power as well as strong dependence.

Cluster 4: Driving variables- These factors have a strong drive power but weak dependence.

**CONCLUSION**

Environmental accounting is a very important aspect of environmental reporting. It provides information related to natural resources and economic well being as well as the costs incurred because of environmental pollution and resource degradation. Green accounting (V2) has been identified as an autonomous variable. GRI (Green Reporting Initiatives) (V4), CERES (Coalition for Environmental Responsible Economies) (V3), Sustainability Reporting (V5) are the dependence variables. There are no linkage variables in the model. Environmental Awareness (V1) is a driving variable.

This study was based on the identification and modeling of legal and regulatory framework with context to sustainability reporting through global reporting initiatives and environmental accounting. All the identified factors were found to be important. Significant interrelations are revealed which are sometimes not exposed by mere observation. The framework proposed in this paper can be utilized to develop strategies towards sustainable reporting which are focused, practical and effective. One of the challenges is the absence of standards for evaluating environmental aspect.

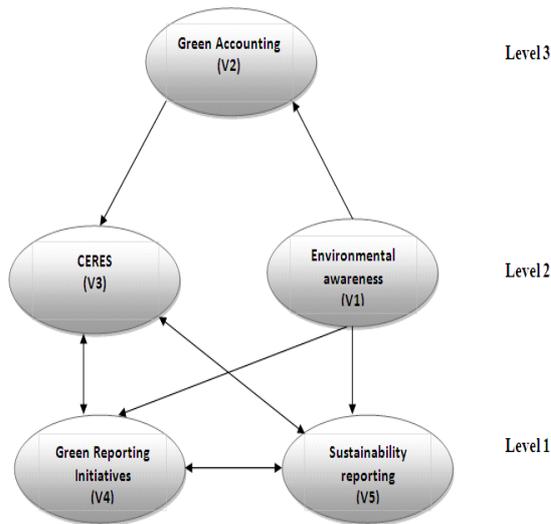


Fig. 1: Model on the factors influencing legal framework of environmental accounting in Indian industries.

### Limitations

The research limits itself to a conceptual understanding of environmental regulatory framework towards sustainability reporting and its core elements; the study is not done at a microscopic level.

### Further Research Directions

The present study needs to be further investigated under the light of legal and economic dimensions. The ISM-based model does not reveal the relative weights associated with each factor. This can be done using the analytic network process. Further, structural equation modeling can be used for testing the validity of the model.

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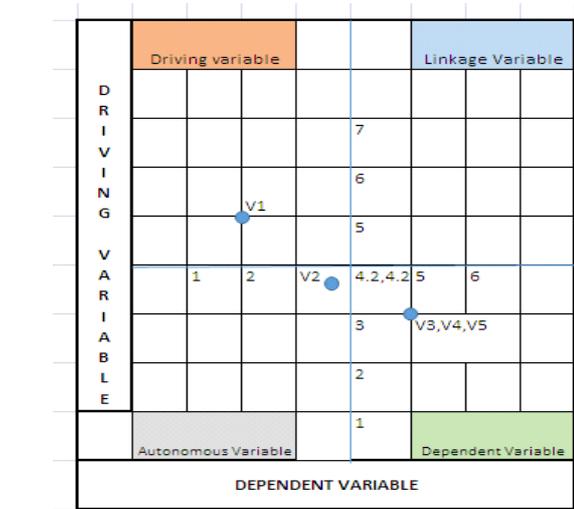


Fig. 2: MICMAC analysis.

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