ENVIRONMENTAL CONSCIOUSNESS, SIZE AND INTENSITY OF ICT ADOPTION IN TWO INDUSTRIAL SECTORS

Kaushalesh Lal[a]
Visiting Professor
UNU-MERIT
The Netherlands

and

Shampa Paul[b]
Associate Professor
Society for Development Studies
India Habitat Center, Delhi

ABSTRACT

India is an emerging economy where rapid growth in small and large enterprises is taking place. The environmental impact of such industrialization has become a prime concern. This study is undertaken to investigate the characteristics of manufacturing units (firms subsequently) that influence their environmental consciousness. The environmental consciousness is measured as intensity of investment on pollution control equipment. The paper uses data from Annual Survey of Industries, 2010-11. The variables used in the study are - investment on pollution control equipment, age of firms, wage rates, size of firms, investment on imported raw material and ICT equipment etc. Two industrial sectors, namely; chemical and textile have been used in the study. A Censored Tobit model is used to identify the factors that influence the extent of investment in pollution control equipment. The findings suggest that newer firms in textile sector are more environmentally conscious. The results also suggest that more environmentally conscious firms are more technology savvy as far as adoption of ICTs is concerned. The factors are not uniform across both the sectors. The size of firms and intensity of ICT used have emerged as common factors while in textile industry, age has also played an important role.

Keywords: Environmental Consciousness, ICT Adoption, Firm Characteristics, Tobit analysis, India

[a] Corresponding author and Visiting Fellow, Institute for Human Development, Delhi.
E: klal_ieg@yahoo.com;
[b] shampa.paul147@gmail.com

1. INTRODUCTION

With industrialization of India, the growth rate in production and consumption has increased the challenge of sustainability and its ecological balance. The term “carrying capacity” is used to measure the ability of earth to sustain a level of population. Traditionally, carrying capacity was measured in terms of ability to feed the population on earth. With advancement in technology, the carrying capacity of earth has increased significantly. However, it has reached a point of diminishing return. Given the human propensity for consumption, environmental degradation will continue. Therefore it is necessary to find alternative ways to develop our economy in harmony with the preservation of our environment. It has increasingly become imperative to implement green decision-making that implies policies are made within environmental constraints with emphasis on conservation of natural resources and improvement in the quality of life of citizens. The industrial growth in India is necessary from an economic point of view to sustain the rapid growth of population. This comes at a price and that is the burden on environment. India’s growing industrial sector is creating environmental problems. The different industrial sectors have varying environmental issues depending upon their nature of work. This study focuses on two industrial sectors i.e. chemical and textile. The study investigates the association between adoption of new technologies and environment consciousness.

The adoption of new technologies is expected to reduce environment degradation as well as to induce efficiency in almost every industrial activity. The new technologies are by and large dominated by information and communication technology (ICT). The applications of ICT are no longer limited to administrative and marketing functions rather lot of production technology is integrated with ICT. For instance, in garment manufacturing, technology used in design of apparel, cutting of fabric and assembling the product is dominated by new technologies, whereas in textile sector, it results in reduction of wastage to a great extent. As far as the chemical industry is concerned, the relationship between adoption of new technology and environment consciousness can be viewed in terms of use of ICT in pollution control equipment. The present effluent treatment plants use more and more ICT intelligence to contain environment degradation

(European Commission, 2008). Thus, the latest treatment plants are more efficient in treating the chemical waste.

The chemical industry contributes significantly to improving the quality of life through major innovations enabling pure drinking water, faster medical treatment, stronger homes and greener fuels. This industry is critical for the economic development of any country, providing products and enabling technical solutions in virtually all sectors of the economy. The industry accounts for approximately 7% of Indian GDP[1] and 3% (approx.) of the global chemical industry. The current size of the industry is approximately $108 billion. The various segments of the chemical industry (such as organic chemicals, special chemicals, chlor-alkali, pesticides, colorants and alcohol based chemicals) has their own unique set of challenges. The share of industry in the national exports is around 11%. In terms of volume, India is the third-largest producer of chemicals in Asia, after China and Japan. Despite its large size and significant GDP contribution, Indian chemicals industry represents only around 3% of global chemicals.

The textile industry in India, after agriculture, is the only industry that has generated huge employment for both skilled and unskilled labor in textiles. Although a low-tech industry, it continues to be the second largest employment generating sector in India. It offers direct employment to over 35 million in the country. According to Ministry of Textiles, the share of textiles in total exports was 11.04% during April–July 2010[2]. In the same year, there were 2,500 textile weaving factories and 4,135 textile finishing factories. India is the second largest producer of textiles and garment in the world.

The variety of chemical products used in every day life is growing rapidly. New chemicals are manufactured and are used which have unknown or detrimental health effects. These chemicals, no doubt have brought immense benefit to society, but they have also brought potential dangers, largely through the waste generated during their production. The textile industries pose higher risk of environmental degradation because

[1] http://planningcommission.gov.in/aboutus/committee/wrkgrp12/wg_chem0203.pdf
[2] A brief report textile industry in India, March 2012

it uses huge amounts of chemicals and dyes. It also consumes large amounts of water both to convey the chemicals and later wash them out. This water becomes full of chemicals and is discarded as waste water that in turn pollutes the environment. In the next section, literature survey of studies related to technology adoption and its association with environment is presented.

2. LITERATURE REVIEW

The relevant literature indicates that the ultimate objective of green management is to conserve natural resources, improve the quality of the physical environment, and improve consumption process. It has also been indicated that under pressure from stakeholders, firms are adopting different patterns of green strategies. According to Boiral (2002), effective environmental management incorporates both tacit and explicit knowledge as green intellectual capital plays a key role in firms that have focused on sustainability, by transferring knowledge regarding regulations, technology, best practices, and initiatives to attain the sustainability goals assumed by the firm. Another study by Carroll (1991) indicates that corporate social responsibility is a pyramid divided into different levels of responsibility, representing the hierarchical order of the firm, with regard to their priorities in satisfying the economic needs of citizens without compromising legal regulations. Only when economic responsibility is realized, can firms move on to fulfill their social and environmental obligations and engage in philanthropic activities, to meet public expectations.

Some other studies suggest that being proactive environmentally may lead to long-term economic gain (Bandley, 1992; Remich, 1993). The manufacturing industries that create environmental pressures tend to attract a great deal of attention from regulatory bodies (Sarkis, 1995). It is likely that firms in more regulated industries face tremendous green pressure because noncompliance has severe negative consequences (Henriques and Sadorsky, 1999; Sharma and Henriques, 2005). Several other scholars (Baker, 1993; Fernberg, 1993; Shi and Kane, 1995) illustrate the success of specific companies using environmental consciousness as a strategy.

Dunk (2002) concluded that product quality and the implementation of environmental accounting are significant factors in enhancing quality performance. It is of specific interest to organizations attempting to evaluate the efficacy of their quality of performance. Other studies reported that firms are adopting environmental policies and introducing ecological quality controls. They also indicate that a firm's poor environmental performance may result in sanctions and penalties as well as reduce its stock market capitalization (Gallarotti, 1995 and Moneva and Llena, 2000). Another study by Brady et.al (1999) found that there is growing expectation among firms that strong environment performers make better investments.

Globally, environmental quality continues to degrade mainly because of the gap between the intent of environmental policy and the actual achievement. Schumacher (1989) and Dasgupta et.al (1998) found small plants to be more pollution intensive because they are difficult and costly to regulate. The empirical evidence also suggests that enterprise size is inversely correlated with emissions intensity in developing countries. Ahmed et. al. (1998) concludes that relatively larger companies are more inclined to be environmentally conscious while the smaller firms are not. Because of their resource constraints, the smaller companies find it riskier to invest in environmental strategies. The study also found that across industries, environmental friendly companies are better performing than the non environmental friendly companies.

Another paper by Fikru (2014) investigates a wide range of plausible determinants of international certification (IC) in Ethiopia. The findings suggest that domestic pressure and firm capability are also equally important. Besides export orientation, international connectivity, sources of finance such as credit from local banks and manager's human capital are significant determinants of IC. It was also found that certification may not necessarily enhance business performance in the short run. In their study, Moini et.al (2014) suggested that the adoption of a green strategy in Danish firms was primarily dependent upon its management planning to develop and implement green strategy, as well as their views of the importance of doing so.

Goedhuys and Sleuwaegen (2013) examine the effects of international standards certification (ISC) on both productivity and sales performance for firms operating in 59 countries. They find that ISC raises productivity and sales performance of firms through efficiency gains and quality signaling, with the effects being larger in countries where market supporting institutions are weak. The largest gain in performance comes from direct productivity improvements helping firms to climb the technological ladder and closing the productivity gap with firms based in developed countries. Frijns and Vliet (1999) in their article on Kenyan firms found that economically favorable cleaner production measures are attractive for small-scale industry in developing countries that results in reducing pollution levels at low costs. The findings suggest that the small-scale industries are, however, constrained in implementing cleaner production by various attitudinal, organizational, technical and economic barriers. To introduce cleaner production methods successfully, the small-scale sector needs support, such as technical and financial incentives, from policy organizations and nongovernmental organizations for inducing enhanced industrial interactions.

Another study by Merlevede et.al (2006) investigates relationship between size of firm and environmental damage. The article finds a U-turn relationship between the two. Cole, et.al (2013) examines association between the level of CO_2 emission and characteristics of Japanese firms. It finds that size is a key determinant of level of CO_2 emission. In order to control the environmental damage both the studies conclude that larger firms are expected to invest more on pollution control mechanism, thereby suggesting that investment on environmental damage is positively related to size of operation. Martín-Tapia et al. (2010) in their study of 123 Spanish food exporting units found that size plays an important role in environmental strategies.

Environmental quality in India also indicates similar trend in environmental strategies. This is also because major problems such as industrial pollution have eluded serious attention (Khoshoo, 1986). Another study by Dasgupta (2000) indicates that environmental enforcement in India has been *ad hoc* and generally ineffective.

Environmental agencies have been more active in recent years, targeting small and medium industries. A solution to these problems may be a participatory and interactive approach to enforcement backed by a package of incentives and penalties. This requires a combination of sanction and compliance-based strategies.

The environmental strategies can be strongly implemented by adopting latest technologies in industrial sectors. These in turn will minimize the environmental impact in different firms. Some studies that focus on ICT adoption and performance of firms based on various industrial sectors have also been undertaken. These studies also highlight on different environmental strategies by the firms. A study by Oyelaran-Oyeyinka and Lal (2006) was about textile and other SMEs in developing countries. They found that the adoption of e-business technologies is not uniform across the industries. But the adoption of these technologies enabled the firms to survive in domestic and international markets. Indjikian and Siegel (2005) highlight quantitative and qualitative research on the impact of IT on economic performance in developed and developing countries. They found that IT-induced changes in workforce composition in favor of highly skilled or educated workers and organizational changes that allow firms to implement IT more effectively and to maximize social returns to IT investment. According to Lal (2004), the performance of firms in international markets has been better for those that have adopted more advanced e-business tools. The size of operations and the skill intensity of a firm's workforce also play an important role in its export performance.

Although many previous studies were on green strategies and environmental sustainability, but mainly focus on one industrial sector. This study intends to focus on the environmental consciousness of two industrial sectors in India in order to capture distinguishing characters of the sectors. The rest of the paper is organized as follows: Section 3 analyses the hypotheses and research methodology. Section 4 discusses the analytical framework. Section 5 presents the data sources providing details of variables used in the study. Section 6 discusses the empirical results, while Section 7 presents the summary and conclusions of the study.

3. HYPOTHESES AND RESEARCH METHODOLOGY

The industrial growth is necessary in India for economic development and to sustain the growing population. This growing industrial activity poses a burden on the environment. Several earlier studies (Fikru, 2014; Moneva and Llena, 2000) focused on the environmental aspects of manufacturing industry. Some other studies (Oyelaran-Oyeyinka and Lal, 2006) were on intensity of ICT adoption in different industrial sectors while this study is undertaken to identify the characteristics of firms that influence the environmental consciousness and intensity of ICT adoption in two industrial sectors. The main objectives of the study are –

1. To identify factors that influence environmental consciousness of firms[3].
2. To examine whether industry-specificity plays any role in environmental strategies.
3. To analyse the factors that contribute in environmental consciousness.
4. To investigate the relationship between intensity of ICT adoption and environmental consciousness of firms.

Based on the above objectives, the following hypotheses have been formulated.

H1: Industry-specificity plays an important role on investment in pollution control mechanism

The extent of environmental degradation varies from one industrial sector to another. For instance, electronic industry is very less polluting while chemical industry is considered highly polluting. Consequently, the factors that determine degree of pollution are likely to be industry-specific. Some studies have been carried out on the industry-specific role of environmental consciousness. A study by Lee and Synodinos (1997) on 203 chemical firms in UK found that much of the legislation has not been as effective in curbing pollution inducing activities. The main reasons included lack of effective communication at country level, lack of consultation during the development of legislation, too frequent legislation changes, absence of incentive as well as enforcement mechanism, and resource constraints. The factors considered in this study were mainly related to

[3] ASI data has been used in the study which is available at the unit level. The manufacturing units are referred as firms in the study.

government policies rather than initiatives of firms. Another study by Post and Altman (1992) argued that the method to control environmental degradation used by the firms to address the environmental requirement influences their success and failure. Hence it is very important for the firms to properly identify environmental strategies before they are adopted. The benchmark of environmental consciousness is specific to industries. Firms' invest in controlling the environment degradation depending on their policies. Thus it is argued that environmental consciousness is dependent upon the characteristics of a specific industry.

H2: Firm-specific factors affect policies related to environmental consciousness.

The performance of a firm is dependent upon its conduct. And the higher performing firms are in a better position to invest in controlling the environmental degradation. Therefore environmental consciousness is likely to be affected by conduct and performance of firms. In this context, several studies have been carried out. Frijns and Vliet (1999) found that in Kenyan firms economically favorable and cleaner production measures are adopted in small-scale industry however these small firms are constrained in implementing cleaner production by various attitudinal, organizational, technical and economic barriers. Another study by D'Souza and Peretiatko (2002) of 400 small and large Indian industries was on chemical, leather and textiles sectors. This paper compares a sample of small and large enterprises in two of the most highly industrialized states in India (Maharashtra and Gujarat), to determine whether there were any significant differences in the way they approach environmental issues. The study found that small enterprises tended to be the worst polluters and gave the least attention to environmental issues as part of their operations. Thus small industries showed laxity in installing pollution control equipment, thereby indicating that size matters as regards environmental issues are concerned. Hence we hypothesize that size of the firm is likely to influence environmental consciousness.

H3: There exists a positive association between environmental consciousness and degree of adoption of new technologies.

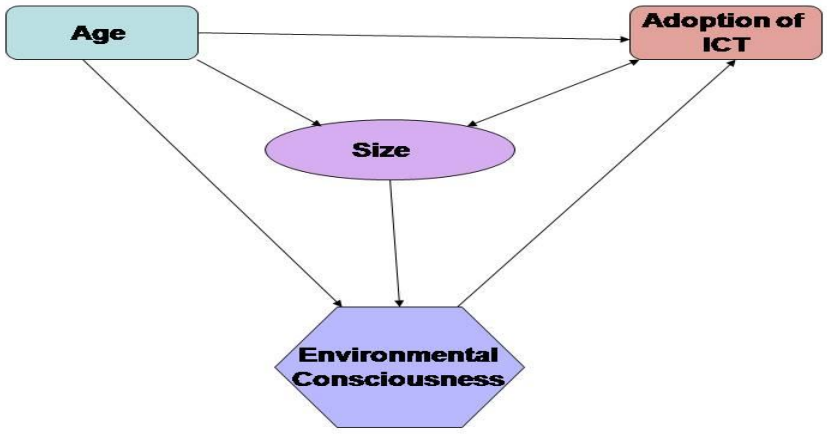
The environmental consciousness and degree of adoption of ICT are considered activities related to the awareness of management regarding returns on such investments. The adoption of ICT is beneficial for firms while investment on controlling environmental degradation is useful for society. It is highly unlikely that the management is aware of gains from ICT, and ignorant about damage due to environmental degradation. Therefore the firms that are managed by technology savvy staff are expected to be environmentally conscious. Fewer studies have been carried out to study the association between environmental consciousness and degree of adoption of ICT. One such study by Ahmed et.al (1998) investigates the relationship between environmental strategy and company performance. They found that environmental conscious companies reported better

performance scores and also are more inclined to incorporate various performance improvement strategies and techniques into their operations. Intellectual capital represents the intangible assets of a firm, including its knowledge, the capabilities of employees, technology, experience, and the ability to implement innovation to reach goals. Firms' can control the environment degradation by adopting newer technologies. For instance, positive impact of ICT adoption can come from dematerialization and online delivery, a host of monitoring and management applications, greater energy efficiency in production and use. Hence we argue that adoption of new technologies has a positive association with environmental consciousness.

4. ANALYTICAL FRAMEWORK

To mitigate environmental degradation, countries around the world have begun pushing for environmental protection and sustainable development. Arresting environmental degradation should be the primary concern of industries especially the manufacturing sector. The ultimate objective of conserving natural resources is to improve the quality of the physical environment, and improve quality of life in general. Increasing environmental consciousness at the firm level is essential. They need to formulate proper policies for environmental conservation. It is expected that there is a close association between the characteristics of firms and environmental consciousness. An analytical framework used in the study is depicted in Figure 1 based on the theoretical argument that firm performance influences environmental consciousness.

Figure 1: Firms and Environmental Consciousness



The figure shows that size influences the ability of firms to protect the environment that is depicted using unidirectional arrow. This implies that larger the size of the firm, higher is the capacity of firms to investment in pollution control equipment by them. The age of firm is also likely to be an important factor in reducing environmental degradation. This is because older firms have old manufacturing technology that is more polluting compared to the newer firms where manufacturing technology is less polluting. The unidirectional arrow indicates that older the firms, more is the investment on initiatives related to environmental conservation.

The adoption of ICT in manufacturing firms has taken place in both developed and developing countries in management and production processes. However, it depends upon the thought process and tendency of the management to use latest technologies. It is expected that the firms managed by environmentally conscious people are also technology savvy and would prefer latest technologies in production and non-production activities. Such technologies are predominantly led by ICTs. The unidirectional arrow depicts this relationship.

5. DATA SOURCES

The data[4] used in the study are from two industrial sectors namely chemical and textile. There are 45 firms in chemical and 16 firms in textile industries. The variables included in the study are – environmental consciousness (measured as intensity of investment in pollution control equipment), age of firm, ICT intensity, total output represented by total receipts, average employment and wage rate. Total receipt has been used as a proxy of sales turnover.

The intensity of investment in pollution control equipment (IIPCE) is the ratio of total expenditure on pollution control equipment to total sales turnover. The ICT intensity is measured as total investment on computer equipment to total sales turnover. The wage rate of firms is defined as wages per employee per annum. The sample firms included under textile manufacturing are both textile and apparel producing. The sample firms have been classified into two groups depending upon their IIPCE. Group I in chemical firms are those where intensity of investment is less than 0.5% and Group II includes rest of the firms while Group I in textile firms are those where intensity of investment is less than 0.25% and Group II includes rest of the firms.

6. EMPIRICAL RESULTS

The data analysis has been carried out at two levels. The firms' characteristics are presented at the first level as uni-variate analysis while at second level multivariate statistical technique called censored tobit model has been used to test the hypotheses.

Univariate Analysis

The univariate analysis of variables in both chemical and textile industries are presented in Table 1. The table provides the mean value of variables in both the industries. The

[4] Annual Survey of Industries, 2010-11

average age of the firms in chemical industry is around 29 years while that of textile is 38 thereby indicating that the textile firms are older.

Table 1: Univariate Analysis of Variables

Variables	Chemical	Textile
Age of Firm (AGE)	28.93	38.13
ICT Intensity (ICT_INT)	0.283	0.121
Sales Turnover in crore (STO)	703.58	214.07
Average Employment (EMP)	628	1299
Wage Rate (WAGE)	308845.3	130799.3
Intensity of Investment in Pollution control Equipment (IIPCE)	0.889	0.813

As far as sales turnover and size of the firms is concerned, chemical firms have much higher turnover with less employees than textile firms where the turnover is less with more employees because chemical industry is capital intensive while textile is labour intensive in nature. It can also be seen from the table that the wage rate in chemical industries is much higher compared to textile. This is because the labour employed in chemical industries is skilled in nature while that of textile are more unskilled and semi-skilled. As a result, the wages are much higher in chemical industries. As far as the investment in ICT is concerned, chemical firms invest more than textile. . The chemical industry is capital intensive than textile, as a result the investment of ICT in chemical firms is more than textile as ICT is required for equipment design, chemical engineering, and process simulation etc.

The association between ICT intensity and environmental consciousness of chemical and textile industries is depicted in Figure 2 and 3. It can be seen from the Figure 2 that the percentage expenditure of ICT in group I firms of chemical industries is 0.20% while that of group II firms are 0.80%. In case of textile industries as indicated in Figure 3, the percentage expenditure of ICT in group I firms of textile industries is 0.10% while that of group II firms are 0.18%. This indicates that IIPCE in group I firms is much less than

group II firms in both the sectors. Hence we can infer that there is a positive association between IIPCE and intensity of ICT investment.

Figure 2: Association between Intensity of ICT adoption and Environmental Consciousness in Chemical Industry

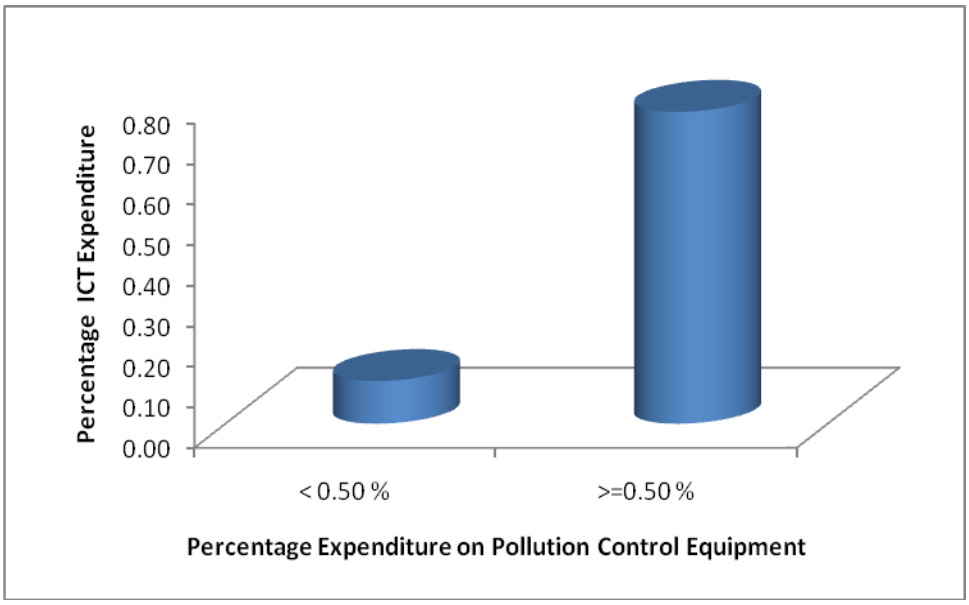
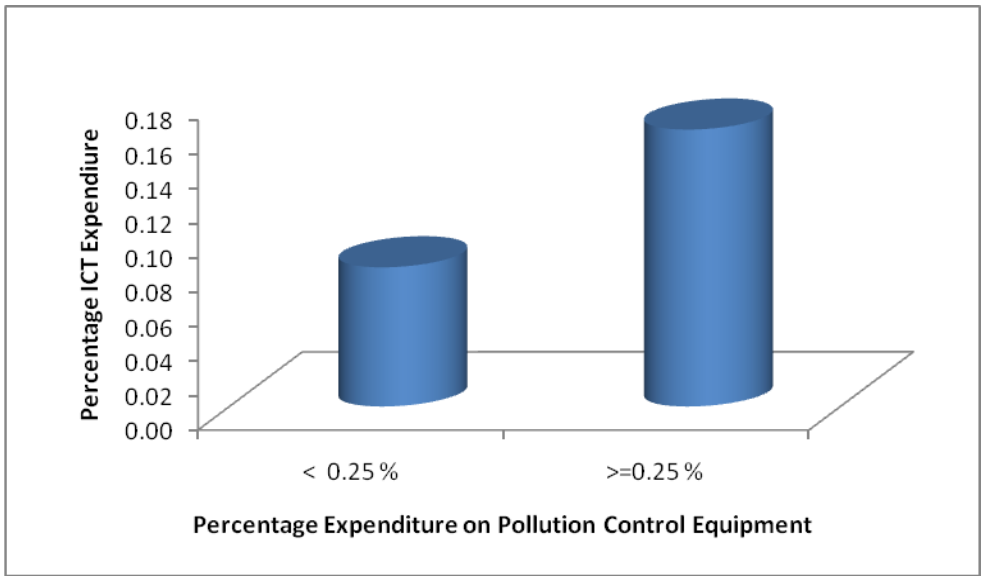


Figure 3: Association between Intensity of ICT adoption and Environmental Consciousness in Textile Industry



Multivariate Analysis

In order to analyse the data in multivariate framework, censored tobit model is used. The tobit model is a statistical model to describe the relationship between a non-negative dependent variable and an independent variable (or vector). The censored tobit model is designed to estimate linear relationships between variables when there is either left-, right- or both censoring in the dependent variable. The dependent variables may also be a mix of discrete and continuous outcomes. In this study, the values of the dependent variable lie between 0 and 1 so tobit model is used.

The results of chemical industry are presented in Table 2.

Table 2: Multivariate Analysis (Chemical industry)

Independent Variables	Dependent variable: IIPCE		
	Coefficient	T-value	Significance
AGE	-0.0001967	-0.93	0.356
EMP	0.0000123	2.08	0.043**
ICT_INT	0.1876792	0.47	0.644
Log(WAGE)	0.0018495	0.33	0.744

Note: *→Significant at 10%, **→ Significant at 5%

As seen in the table, only size of the firms and is significant at 5% level. Earlier studies also highlight that small manufacturing enterprises do not invest much in pollution control as they are more focused on higher returns on their investment and hence they are extensively polluting in nature (D'Souza, 2001). Finding with respect to size of the firms is inline with other studies and also according to the hypothesis.

The Table 3 depicts multivariate analysis of textile industry. Two models have been analysed here as the correlation between average size of employment and age of firms is 0.54. Consequently these two variables cannot be taken together in a single model.

Table 3: Multivariate Analysis (Textile industry)

Independent Variables	Dependent variable: IIPCE					
	Model I			Model II		
	Coefficient	T-value	Significance	Coefficient	T-value	Significance
AGE	0.0004799	1.84	0.087*			
EMP				0.0000105	2.76	0.015**
ICT_INT	1.240954	0.40	0.697			
Log(WAGE)				0.0033135	0.35	0.733

Note: *→Significant at 10%, **→ Significant at 5%

The results presented in Table 3 suggest that age and size of firms positively and significantly influenced IIPCE. They have emerged significant at 10% and 5% respectively. The emergence of age as significant factor suggests that newer firms are more environmentally conscious. Another factor that could be attributed to this phenomenon is that despite similar investment in pollution control devices by old and new firms, IIPCE might be higher for newer firms due to low sales turnover compared to older firms. Textile industry consists of firms manufacturing apparel also. And there are hardly any entry barriers in apparel industry. Consequently, this sector has witnessed emergence of new firms recently. This is reflected by the fact that average deviation of age is 5 years.

The finding related to size is in accordance with existing literature and our hypothesis. It is obvious that firms with larger size of operation are in a better position to invest more in pollution control devices.

7. SUMMARY AND CONCLUSION

The growing environmental awareness tends to create pressure on manufacturing industries in India that attracts a great deal of attention from regulatory bodies. It is likely that firms in more regulated industries face tremendous green pressure because noncompliance has severe negative consequences. Thus, it can be expected that these firms are more likely to be proactive about environmental issues and increasingly committed to sustainability strategies. This study is aimed at analyzing the firm characteristics that influence the environmental consciousness in two industrial sectors in India namely – chemical and textile. The Annual Survey of Industries 2010-11 has been used to analyse the data. The overall findings of the study are –

Industry-specificity and investment in pollution control mechanism:

There are industry-specific factors that influence the investment on pollution control devices in chemical and textile firms. Age has emerged as a significant factor in textile while it is insignificant in chemical industry. The emergence of age as significant factor in textile suggests that newer firms are more environmentally conscious. Another factor that could be attributed to this phenomenon is that despite similar investment in pollution control devices by old and new firms, IIPCE might be higher for newer firms due to low sales turnover compared to older firms. Textile industry consists of firms manufacturing apparel also and there are hardly any entry barriers in apparel industry. Consequently, this sector has witnessed emergence of new firms recently.

The chemical firms on the other hand are capital intensive. Consequently the sector faces strong entry barriers which are reflected by the fact that average deviation of age from mean value is 14 years suggesting that most of the firms are older firms. No firm has come up for the last 14 years.

Firm-specific factor effects environment consciousness:

The way the firms perceive environmental issues depends on their knowledge and understanding of the issues. The multivariate analysis of chemical firms in this study

proves that the managers of these firms are better placed to invest in pollution control equipment due to large size and human capital of these firms. These firms are high-tech in nature and better performing. Also the management is better placed to adopt newer technologies that are helpful in environmental conservation. The size is important for textile as well because firm needs financial resources to invest in pollution control devices. Without sufficient financial resources, firms cannot invest in activities such as pollution control mechanism that do not contribute to their returns directly.

The most distinguishing finding of the study is that size plays an important role in installing pollution control devices. It may be worth mentioning that there is a minimum investment on such devices irrespective of sales turnover, suggesting that firms have to incur certain amount of investment which becomes extremely difficult for a small firm. But small firms cannot be allowed to discharge effluents that are causing environmental hazards. The solution to this problem is common effluent treatment plants on cost sharing basis. Hence it is recommended that such plants need to be set up at the industrial cluster level so that the investment by individual firms would be reduced at the same time the arrangement would lead to cleaner and healthy environment.

There exists positive association between ICT adoption and environment consciousness:
The investment on new technologies is a reflection of the attitudinal behavior of the management of firms. The management that is more environmentally conscious is likely to adopt new technologies in other industrial activities. The finding of the study confirms this hypothesis. Although the hypothesis holds true for both the sectors, average investment on ICTs (0.12%) in textile industry is much lower than chemical (0.28%). The chemical firms use ICT tools for office automation, production and marketing. The advanced marketing tools are used to manage the dealer networks in these firms. Thus the chemical firms adopt more newer technology. On the other hand the adoption of ICT is very limited in textile firms as ICT use is only limited to production and very less in marketing activities.

The study suggests that relatively larger firms are more inclined to be environmentally conscious because the smaller firms are constraint of their resource base and they find it riskier to invest in environmental strategies. With growing environmental issues, the firms should not view these concerns as detrimental to performance. On the contrary, they can increase their performance and at the same time be socially responsible by focusing on these strategies that is true both for large or small firms.

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