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Human Resource Dimensions for Environment Management System: Evidence from Two Indian Fertilizer Firms

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Abstract
While economists and business leaders argue at length about economic regimes and policy implementations as key drivers of growth and sustainability patterns in firms, it is the less immediate causal links -- like the environment -- that often get elided or underwritten in the process. Notwithstanding such elisions, the issue has had a way of coming back to the center, as evidenced from changing trends in social and consumer expectations and also corresponding intricacy of global environmental conventions. Environment Management Systems (EMS) is now integrated into the structural framework of firm operations as a preventive tool that can better control the impact a firm has on the environment. Having said this, it is also true that a major input in operationalizing EMS comes from factors driven through Human Resource (HR) functions. This paper attempts to empirically test this interactive relationship between EMS and HR dimensions.
Key words: Policy implementations, Sustainability, Environment Management Systems, Preventive tool

1. Introduction

There is a veritable body of research on how business strategies as well as core values of firms increasingly have to shift ground owing to changing social and consumer expectations and also corresponding intricacy of global environmental conventions (Berry and Rondinelli, 1998; Bhushan and MacKenzie, 1994; Klassen and Angell, 1998; Klassen and Whybark, 1999). Consequently, organizations have been undergoing a process of evolution wherein Environment Management Systems (EMS) is now integrated into the structural framework of firm operations as a preventive mechanism designed to better control a firm's environmental impacts (Brockhoff, Chakrabarti and Kirchgeorg, 1999; Chen, Hergeth, and Zuckerman, 2002; Barnes, 1996). The appeal of EMS is that it offers a structured approach by providing a system of planning, action and reviews of daily activities that can help firms improve their operations vis-à-vis the environment (Hersey, 1998). A major component of firm level preparedness in implementing the EMS has to be its human resource factors. A key question here arises -- how well are firms prepared in their human resource inputs to implement the EMS? Although research has examined the importance of HR factors in implementing a successful environmental management system (Angell and Klassen, 1999; Chinander, 2001; Daily and Huang, 2001; Zutshi and Sohal, 2003), empirical studies in this respect have been few (Drumwright, 1994; Rothenberg, Frits, and Maxwell, 2001; Wee and Quazi, 2005). A yawning gap that often bugs a researcher is that there is very little data on the relationship between HR factors and EMS dimensions. This situation is all the more palpable in the case of an emerging economy scenario like India, where there is no tested or comprehensive model of this relationship as such. An agenda of this study therefore is to investigate this gap.

Many Indian corporations are now developing a formal environment management system. The International Organization for Standardization's (ISO) environmental approach in conjunction with the Indian legal-compliance framework[3], provides the broad and sub-network of managing environmental imprints for firms. At the same time,

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[3] To give a brief pre-view of the legal framework of environmental protection in India include the following: The Directive Principles of State Policy in the Constitution of India provide for the Protection and improvement of environment and safeguarding of forests and wild life. The Water (Prevention and Control of Pollution) Act, 1974; The Air (Prevention and Control of Pollution) Act was passed in 1981 for the prevention, and control of air pollution and preservation of air quality. Environment protection is also ensured by the Environment (protection) Act, 1986; Hazardous Wastes (Management and Handling) Rules, 1989; Manufacture,

implementation of EMS is not an easy matter and research has identified various barriers pertaining to it. According to Chan's (2008) study, availability of support structure and resources, professional advice and understanding to put into action can constitute some of the major hurdles in implementing EMS. If the organization intends to overcome these barriers, the role of human resource will be critical in making or breaking a successful environmental management. By extension therefore, there is a significant relationship between environmental compliance, performance and competitive advantage of an organization. Since the adoption and maintenance of EMS requires aligning human resource management with the environmental management, there are various HR factors like employee involvement, training and development, team work etc. which facilitate the functioning of main domains of EMS. This study looks at two leading fertilizers manufacturing organizations in India that complied with Environment Management System. It examines how policy, planning and corrective action factors of EMS to leadership to champion HR dimensions for EMS.

2. Theoretical Framework

There is a wealth of literature on the role of HR factors in environmental management (Cook and Seith, 1992; Wever and Vorhauer, 1993; Woods, 1993; Bhushan and Mackenzie, 1994; Lent and Wells, 1994; Gupta and Sharma, 1996; Mallak and Kurstedt, 1996; Epstein and Roy, 1997; Beard and Rees, 2000; Kitazawa and Sarkis, 2000; Carter and Dresner, 2001; Daily and Huang, 2001; Govindarajulu and Daily, 2004). There is not a lot available, however, by way of empirical research. Carter and Dresner (2001) in their work, found the role team structures and formal and informal training play to overcome barriers to environmental project development. Drumwright (1994) indicated top management support as contributing to the success of socially responsible buying. Although Wee and Quazi (2005) identified top management commitment, employee involvement, and training as the idea resource factors, their work does not extend to proposing or testing significant relationships among these factors or for that matter with performance. Rothenberg, Frits, and Maxwell (2001) show a positive relationship between training issues associated with lean manufacturing and resource efficiency.

2.1. Development of ISO 14001 and EMS requirements

The development of environment standards first began with the formulation of British Standard (BS) 7750 by the British Standards Institute (BSI) in 1992. The BS 7750 standard provided a prototype for the ISO 14000 standards for EMS developed by the International Organization for Standardization (ISO).[4] EMS standards, resulting from its precursors also evince a similar set of essentials which include: the creation of an environmental policy; setting objectives and targets; implementing a program to achieve those objectives; monitoring and measuring its outcomes and effectiveness; taking corrective action; and, review of the system in order to improve effectiveness of environmental performance. The underlying philosophy in all of this is, whatever the organization's activity the requirements of an effective EMS are the same. The ISO 14001 takes a comprehensive view of all of the processes of an organization - hence it is system dependent, and not person-dependent (Srinivas and Yashiro, 1999). ISO 14001:2004 are tools that can be used to meet internal objectives such as creating assurance about control of the organizational processes and activities that have an impact on the environment and assure employees that they are working for an environmentally responsible organization. Thus, any organization that is able to implement, manage and improve on EMS will seek an ISO 14001 certification.

A brief review of the EMS variables under the present study is as follows:

EMS Factors:

Storage and Import of Hazardous Chemical Rules, 1989; Noise Pollution (Regulation and Control) Rules, 2000. In addition, there is The Public Liability Insurance Act, 1991 which is intended to provide immediate relief to persons affected by accidents while handling hazardous materials.

[4] ISO 14001 is a voluntary international standard developed by the International Organization for Standardization (ISO), based in Geneva, Switzerland. The ISO 14000 family addresses various aspects of environmental management. The very first two standards, ISO 14001:2004 and ISO 14004:2004 deal with EMS. ISO 14001:2004 provides the requirements for an EMS and ISO 14004:2004 gives general EMS guidelines. See (http://webstore.ansi.org/)

An EMS is said to be a continual cycle which includes policy making, planning, implementing, reviewing and improving the environmental performance of an organization[5]. Benefits derived from an effective EMS include efficient use of energy, water consumption, waste utilization, improved public image, increased marketing advantage and cost saving advantages for organizations through apt usage of process and people. In other words, there is a positive relationship between environmental and firm performance (Tibor and Feldman, 1996). As a comprehensive approach, EMS includes documentation of organizational commitment to observing all the EMS factors which include policy, planning, implementation, measurement and evaluation, and review and improvement (Hersey, 1998; Lin et al., 2001). It is necessary for the management of an organization to provide commitment to environmental improvement efforts by adopting a formal EMS. EMS ISO 14001 has been broadly categorized into the five major categories which are performed in systematic and iterative way. The EMS factors are: Policy, Planning, Implementation, Corrective Action and Management Review.

Policy: this refers to the policy aspects defined by the top management for implementing EMS in an organization which is also communicated to its employees. The environmental policy ISO 14001 includes the following minimum requirements: commitment of continual improvement and prevention of pollution, commitment to comply with legislations and regulations, framework for setting and reviewing environmental goals, commitment to documentation and implementation.

Planning: this includes issues like legal requirements, objectives and targets, environmental aspect determination and environmental management program structure (Jackson S L, 1997). It establishes and maintains procedures to identify and control activities, products that could potentially have significant impact on the environment. The environmental management program sets the groundwork to achieve these goals and should also assign responsibilities to individuals.

Implementation: this refers to how the organization should design a structure that provides available resources to facilitate effective EMS. Training and development is an important aspect in developing knowledge and skills to accomplish the objectives and targets of EMS. The accent is on internal communication that should flow from top to bottom so that all employees have up-to-date information on environmental impact. EMS documentation needs to be in place to describe all the core elements and their interaction.

Corrective Action: The elements covered under the corrective action include monitoring and measurement, nonconformance and corrective and preventive action, records and environmental management system audit. It takes into account various environment performance indicators. Corrective and preventive action deals with procedures that define the responsibility for recognizing and correcting actions to remove negative environmental impacts.

Management Review: this is the process were top management periodically review the progress of their EMS. The reviews are helpful in determining the effectiveness and adequacy of the environmental management system. This helps in continual improvement of elements which are essential for the success of maintaining an effective EMS. The results of these reviews will be helpful in making amendments in the policy, objectives and targets and other elements of the EMS to improve the environmental performance. The main aim of this research is to find out the interactive relationship of human resource dimensions for EMS in executing the EMS capability of an organization.

2.2 Perceived Human Resource dimensions

Human Resource Factors in developing EMS can be found in various researches (Carter and Dresner 2001; Beard and Rees 2000; Cook and Seith 1992). Most important of them is education and training, communication systems, team work and green teams, reward systems to encourage environment building behavior, leadership to champion environmental improvement, attitude of top management to invest in EMS, involvement of managers and employee empowerment. This research paper discusses some of these variables.

2.2.1 Education and training are essential ingredients of effective implementation of EMS. It is crucial means of pushing the business community towards sustainable development. The idea for environmental education dates back in 1972 United Nations Stockholm Conference on the Human Environment. More of EMS training provides an opportunity to employees to solve environmental problems. It increases employees awareness related to environmental control, ability to adapt to change, and develops a positive attitude toward environmental issues (Wong, 1998). Further, EMS training programs are also useful in communicating to employees any changes that occur in a firm's

environmental approach and liabilities in addition to making people aware of the intricacies of the regulatory mechanism and climate (Cook and Seith, 1992).

2.2.2 Empowered employees are motivated and committed to participate and engage in environmental practices. Empowerment helps workers to voluntarily participate and decide on issues related to improving environment. The organizational design and structure can also facilitate empowerment. A flat organizational structure promotes more participative decision among employees. The introduction to any new strategies and programs will produce optimal results when employees are treated as major stake holders in the organization (Mohrman et al., 1996). Any corrective action or change in environmental policy needs employee support.

2.2.3 Green teams - In order to attain greater environmental excellence in the move towards sustainable business operations, organizations must make more use of their talents from the existing pool of employees, encouraging dialogues in the management structures and processes to unlock new ideas, innovation and creativity. With Green teams the gamut of experience can range from idea generation, improved learning, exploration and identification of conflict issues and action plans (Kaur, 2011) to enhance understanding about the proverbial five 'W's and one 'H' (why, what, where, when and how) to go for the best environmental alternatives (Beard and Rees 2000).

2.2.4 Leadership to champion environmental improvement- The leaders of a firm create a view that influences the human capital and the resources of the organization sharing with its members the values, commitments and aspirations they intend to achieve in the business domain, also in the environmental area. The top management and leaders support are very important in reaching the most advanced levels of environmental development because they decide on policy, transparency in information that reach employees, the rewards, building up the organizational culture and act as catalyst to change. The support of top management can affect the success of an Environmental Management System. Top management decides the environmental policies which in turn establish the level of training and communication that will be necessary. Without a solid framework, it is almost impossible to motivate employees to take effective steps for environmental improvement (Govindarajulu and Daily, 2004).

3. Objective of the study

The main aim of this research is to find out the interactive relationship of human resource dimensions for the EMS in executing EMS of an organization.

3.1 Hypothesis of the study

Researchers identify that the communication of environmental issues, policies, implementation and action by the management affect employee perceptions regarding the linkage of their actions to environmental consequences (Chinander ,2001; Govindarajulu and Daily, 2004; Gupta and Sharma, 1996). Therefore the following Hypothesis is examined from the research paper:

Alternative Hypothesis: Perceived HR dimensions for the EMS will be positively related to EMS factors of an organization.

3.2 Research methodology

The present research work uses a Descriptive Research design. The primary data used in the study was collected from 100 respondents working in two leading fertilizers manufacturing organizations in India. These organizations were chosen for study in order to examine their existing Environment Management System as fertilizer plants also contribute to atmospheric emission, effluent and solid waste generation. In order to understand the HR factor perceptions of employees, two separate Questionnaires were designed. Five EMS parameters of 19 statements were constructed with statements like 'The environmental policy is communicated to all employees,' 'There are scheduled periodical review meeting on the EMS' with Cronbach's Alpha 0.731. Four HR parameters of 13 statements measuring HR variables with statements like 'Personal green office practices are often shared in my organization', 'Emails that need to be kept as record are only printed' in Likert scale were 1 represents strongly disagree to 5 representing strongly agree. The Cronbach's Alpha of HR dimensions tool is 0.668. In both the tools parameter wise inter correlations were calculated and statements with $r < 0.60$ were removed from the particular parameter/ dimension to the study. The tool was validated from judges 12 practicing managers in the field of Quality management and Human Resource.

4. Result analysis

In a dynamic competitive business environment companies thrive to exist with multiple product lines, quality of product and service and stakeholder satisfaction. At the same time, there is accumulated evidence that this has resulted in exploitation of natural resources. Out of concerns of rectifying this depleting situation, organizations have

initiated an effective EMS in place. The human resource dimensions teams, training, top management and empowerment facilitate in implementing the structure and design of the EMS. This part of the research paper tries to capture the employee perception on EMS factors, HR dimensions for EMS and the interaction between HR dimensions for EMS and EMS factors.

4.1. Mean Scores of EMS Parameters

The table 1 shows that respondent employees of the sample manufacturing organizations demonstrate agreeability to policy (3.8317), planning (4.1900) and corrective action (4.2867) parameters of EMS. This shows that the organization's shows commitment to environmental laws and regulations. The implementation (3.4700) and management review (3.4733) parameters have mean scores of lower value which indicates that the reviews and the audits regarding the environmental sustainability need attention by their organization.

4.2. Mean Scores of Human Resource Dimensions for EMS

It can be noted from table 2 that mean value of green teams is 4.18 which represents in these organizations green teams that are formed helps to achieve the environmental sustainability targets. Parameter 'education and training' has mean value of 3.99. It shows EMS trainings are conducted in the organization and employees do take part in these sessions. Leadership to champion environmental improvement has mean of 4.35. This ensures that environmental sustainability goals are established and achieved by the organizational leadership. Employee Empowerment parameter has a mean value of 3.05. This represents employees of the organizations under the study is primarily not taking part in environmental sustainability initiatives.

4.3. Interactive relationship of human resource dimensions for executing EMS in an organization

It can be found from table 3 that positive interactive relationship exists between policy EMS Factors ($r= 0.449$, $p< 0.05$) to leadership to champion of Human Resource Dimension for EMS. It proves that the environment management policy sets a ground work for achieving EMS vision for an organization. The correlation between planning ($r=0.198$, $p<0.05$) and Corrective action ($r=0.196$, $p< 0.01$) with leadership to champion HR dimension of EMS revealed positive relationship but of minute significance from the present empirical work. It could be noted that there is a negative relationship between implementation ($r= -.194$, $p<0.01$) and management review ($r= -.213$, $p<0.05$) parameters of EMS to leadership to champion of Human Resource Dimension for EMS. The study also reveals a positive correlation of 0.203, $p< 0.01$ and 0.263, $p<0.01$ for planning and management review of EMS factors to green teams. It can understood that EMS green teams provides a chance for employees from various departments and functions to come together to find solutions to multifaceted problems in the management review process.

It can be observed employee empowerment parameter of HR dimension for EMS have a negative relationship with all the parameters of EMS i.e., policy($r= -094$, $p<0.01$), planning($r= -.114$, $p<0.05$), implementation ($r=-.252$, $p<0.01$), corrective action ($r= -.212$, $p<0.01$), and management review ($r= -.234$, $p<0.01$) which shows that employees perceive that they are not involved in environmental sustainability objectives of the organization. It reveals HR has no significant role in EMS empowerment among employees in these organizations.

5. Discussion

With the growing demand in the Indian agricultural sector, sustainable agriculture is only possible by balancing increased production of fertilizers with minimum adverse environmental consequences. Thus in this process of managing global and local environmental problems organizations need to create environment policies that are technically sound, economically viable, practically feasible and socially acceptable. There is a necessity to align environmental policy, people and processes of implementation within the organizations.

The mean scores of EMS parameters examined under the study indicates that the organizations have clarity in environmental objectives of the EMS Policy, the way continuous improvements are planned and corrective action of the policy is done by organization very well. An integral function of an EMS is to assist firms in improving their environmental operations through checkpoints embedded into the system pertaining to how activities are planned, scheduled implemented planning, scheduling, implementation and monitoring takes place of daily activities (Hersey, 1998). Employees do agree that management conducts reviews and audits for monitoring and controlling the

environmental sustainability activities and programs with an indication that the roles, responsibilities and authorities necessitates better comprehensible definitions and communication for implementation.

In the HR dimensions for EMS, the study indicates employees perceive green teams are beneficial to the process of implementing EMS. According to Beard and Rees (2000), green teams help employees in understanding and following environment friendly behaviors. The mean scores on HR trainings on EMS shows organizations train people in EMS. Success of EMS implementation depends on the involvement of managers. Involvement happens when they are trained and are aware about policies, changes and regulations that are to be adhered to in the organization. This helps employees to conduct their job with consciousness of the environment (Daily and Huang, 2001).

According to ISO 14001 guidelines top management's involvement in environment policy includes commitment of the top management in implementing EMS. The assertion of this research is in consonance with Wilms et al (1994) views that people will follow management's direction. It is evident with the positive relationship between environmental policies, planning and corrective action to leadership to champion of Human Resource Dimension for EMS. What is noteworthy is the *negative* correlation between implementation, management review with the HRM factors of leadership to champion EMS. It indicates that top management initiates EMS as a matter of planning and policy but are not serious about implementation. It is important for the management to show visible support to EMS through their HR practices as EMS or certification for ISO 14001 enhances business ability to control and prevent environmental problems.

6. Conclusion

Environmental sustainability should not be realized because of the compliance of the rules and regulations but in order to save environment and that is the road to sustainability. The research identifies implementation of EMS could be conducted in a structured manner by collaborating HR factors as green teams, empowerment and training. According to the social learning theory, employees reproduce those learnt behaviors modeled by leaders through positive reinforcers. As noted by researches failure in executing an EMS policy mostly depends on the factors of organizational culture (Kitaswa and Sarkis, 2000) and lack of being proactive to any organizational change process. Even though the present research work has not examined culture as a variable, the strength in the relationship between variables indicates the relevance of top management's role in understanding the organizational culture while generating EMS policies and necessary organizational change efforts. The gap in employee empowerment identified from this research need attention and pertinent review. It is valuable to note that EMS empowerment has immense benefits such as self controlled behavior, individual thinking, and innovative problem solving etc. (Mallak and Kurstedt, 1996). The organizations under study do not empower their employees to become environmentally conscious. Eventually this could act as a barrier for reaching excellence and environmentally sustainable future.

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Table 1: Mean Scores of EMS factors

EMS factors	Minimum	Maximum	Mean	Std. Deviation
Policy	1.00	5.00	3.8317	.97720
Planning	3.00	5.00	4.1900	.42350
Implementation	1.00	5.00	3.4700	1.36943
Corrective action	3.00	5.00	4.2867	.48849
Management Review	1.00	5.00	3.4733	1.29417

Table 2: Mean Scores of Human Resource Dimensions

Human Resource Dimensions of EMS	Minimum	Maximum	Mean	Std. Deviation
Green Teams	2.00	5.00	4.1800	.59255
Education and Training	3.00	5.00	3.9900	.38912
Leadership to champion environmental improvement	2.00	5.00	4.3500	.55069
Employees Empowerment	1.00	5.00	3.0521	.97323

Table 3: Relationship between EMS factors and Human Resource Dimensions

FACTORS		Green Teams	Education and Training	Leadership to champion	Employee Empowerment
Policy	Pearson Correlation	.112	.091	.449**	-.094*
	Sig. (2-tailed)	.268	.370	.000	.039
Planning	Pearson Correlation	.203**	.131	.198**	-.114*
	Sig. (2-tailed)	.000	.193	.000	.023
Implementation	Pearson Correlation	.194	.022	-.194**	-.252**
	Sig. (2-tailed)	.053	.832	.001	.000
Corrective action	Pearson Correlation	.118	.074	.196**	-.212**
	Sig. (2-tailed)	.241	.462	.001	.000
Management Review	Pearson Correlation	.263**	.022	-.213**	-.234**
	Sig. (2-tailed)	.008	.832	.000	.000

**5 percent level of significance, * 10 percent level of significance

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