Linkage between 'Triple Bottom Line' and Business performance: Indian Small and Medium Enterprises Perspective

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Abstract

In recent years, rapid economic reforms and industrialization pose severe threat and have adverse impact on environment resulting in loss of many useful resources and causing severe human deceases. There is an urgent necessity to strike a balance between industrial development and physical environment to reduce the intensity of industrial pollution. The triple bottom line approach tested with data collected from 245 plants located eastern region of the country. The central theme of the study is to investigate the impact of 'triple bottom line' on firm's performance in an emerging economy. The research findings substantiate the existence of triple bottom line approach and showed significant causal relationship with business performance among manufacturing SMEs.

Keywords - Triple Bottom Line, sustainability, business performance, SME, India.

Introduction

Small and medium enterprises (SMEs) in manufacturing sector need to show deep attention towards adoption of triple bottom line (3BL) approach for cleaner production and competitive advantage. In organisational perspective, 'triple bottom line' referred as firm's responsibilities related to economic aspects along with social and environmental measures of performance. SMEs from developed economies like European Union and USA have implemented the concept of sustainable manufacturing practices aimed towards managing 'triple bottom line' and increased overall business performance (Burke and Gaughran, 2007; Lee, 2009). It has been evident that labour intensive economies like India, also showing growing interest towards environmental sustainability by using 3BL approach.

SMEs play vital role in socio-economic development of the country (Gibcus *et al.,* 2009). They employed around 80.5 million people exhibiting second largest employing sector after agriculture (MSME Annual Report 2011-12). They accounts for 40 per cent of the country's' total exports and contribute 45 per cent of total manufacturing output. On the contrary, SMEs contributes 70 percent of national industrial pollution (DCSME, 2009; Ministry of Environment and Forests, 2009) and acknowledged for poor sustainability and 3BL approach in comparison with large firms. They exhibit reactive approach towards natural environment and mainly focus on compliance than sustainability (Sharma and Vredenburg, 1998). Few of the scholars stated that SMEs consider environmental and social policies as accrued cost and presume inverse relationship with business profits (Reimers-Hild CI, 2010).

Very few literatures exist contributing toward causal relationship between 3BL approach and business performance in Indian perspective (Subrahmanya *et al.,* 2010; Vinodh *et al.*, 2012). Therefore, SMEs need to understand their resource dynamics and business environment to incorporate triple bottom line approach as business opportunity for long run. Thus, the main objective of the research is to understand the relevance of adopting '3BL' approach in Indian SMEs and examine the impact of 'triple bottom line' on business performance in an emerging economy.

Conceptual framework and hypothesis development

Research aspirations toward sustainable development of business has emerged in late 1980s with the article on managing planet earth (Clark, 1989; Daly and Cobb, 1994) and received wide attention after the report 'Our Common Future' now commonly named as "Brundtland Report'. The United Nations World Commission on Environment and Development (WCED) in its report defined sustainable development as "development which meets the need of the present generations without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987).

Sustainability measured in terms of economic, environmental and social longevity and foresight, which has been referred as 'triple bottom line' (Pagell and Gobeli, 2009). The concept has also received extensive consideration in the implementation of corporate business strategy and economic development. 3BL approach in manufacturing operations has come to the fore, with firms striving to fulfil not only the immediate needs of markets and society, but also future requirements (Quental *et al.,* 2011; Seurig *et al.,* 2008). It has been also argued that most of the SME tempted to sacrifice long term goals such as environmental and social concerns at the cost of survival and profitability (Fassin, 2005; Hannafey, 2003). In order to address the importance of triple bottom line policies, a conceptual framework has been designed from the perspective of triple bottom line approach and business performance of SMEs (as shown in Figure 1).

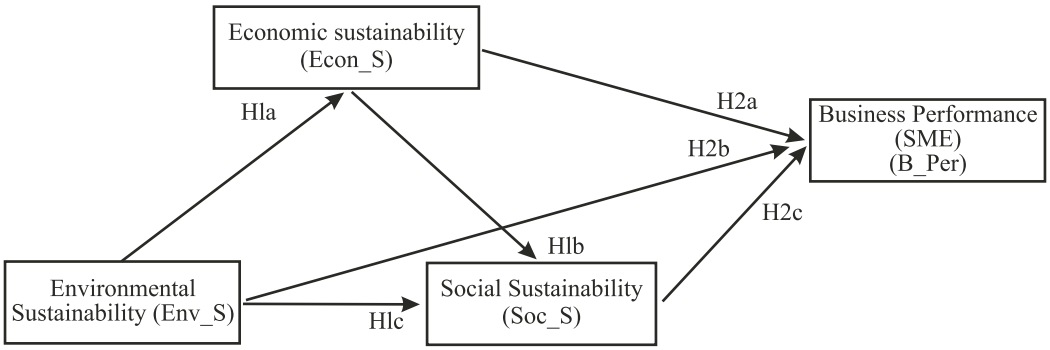

Figure 1: Conceptual framework of triple bottom line and business performance.

Triple Bottom Line (3BL) approach

Changing global environmental patterns raised high apprehensions among world's leading environmental organizations such as Intergovernmental Panel on Climate Change (IPCC), United Nation Environment Program (UNEP) etc toward ecological balance. Earlier, sustainability in manufacturing enterprises has been assessed in terms of economic performance while sustainability mainly lies in social and environmental practices of organizations (Singh *et al.*, 2013). Goodland and Daly (1996) have emphasized that along with economic sustainability, environmental and social sustainability are also integral part of sustainability and termed as 'triple bottom line' (3BL) in organisational context. The triple bottom line approach has been eloquent and comprehends sustainability in convenient language to the organizations and their stakeholders. The main objective of 3BL approach is to change the contemporary methodology of evaluating values and accounts for economic capital at the expense of social and natural capital. It incorporates organisational environment, social values and traditional economic values (UNCTAD, 1996). The approach has become a driving force for increase in demand of sustainable investment and has shown a positive relationship between effective management and accountability (Waddock and Groves 1997).

Contrary to the above assumptions, SMEs perform reactive environmental behaviors toward elimination

of environmental pollutants or waste. Various descriptive studies demonstrated that SMEs comply with environmental regulations but their level of environmental commitment has been generally observed to be low (Schaper, 2002). Scholars have constantly argued that SMEs prevent themselves from adopting such practices mainly due to their limited resources (Russo and Fouts, 1997). In various countries, SMEs successfully implemented social and environmental strategies consistent with the advanced practices including innovations that prevent pollution at the source rather than pollution control at the end-of-the-pipe and societal welfare (Carlson-Skalak, 2000; Hillary, 2000). Therefore, economic, social and environmental sustainability are incorporated to evaluate its interrelationship in small firms (Sharma and Vredenburg, 1998; Arago' n- Correa *et al.,* 2008). So, it is hypothesized that:

H1a: Environmental sustainability is positively related to the economic sustainability of firm.
H1b: Economic sustainability is positively related to the social sustainability of firm.
H1c: Environmental sustainability is positively related to the social sustainability of firm.

Triple Bottom approach and business performance of SMEs

Business performance has been broadly classified into financial and non-financial performance (Santos and Brito, 2012). The key indicators of financial performance are efficiency, effectiveness, profitability, growth and market value while non-financial performance includes customer and employee satisfaction (Consoli, 2012; Santos and Brito, 2012). Few studies support the relationship between 3BLapproach and business performance (Christmann, 2000; Wagner, 2005) and lead to reduction in production cost, open new markets and find beneficial uses for waste (Tsoulfas and Pappis, 2006). It also help to enhance firm's image, competitive advantage and market exposure, resulting into improved business performance (Rao and Holt, 2005). Though, attention has been drawn to the market potential and economic output but environmental and social performance of firm is ignored (Yang and Chen, 2011). Therefore, to analyze the causal relationship of 3BL approach and business performance of SMEs, it is proposed that:

H2a: Economic sustainability is positively related to the business performance.
H2b: Social sustainability is positively related to the business performance.
H2c: Environmental sustainability is positively related to the business performance.

Method

The study is based on the survey of manufacturing SMEs located in the Eastern region in India. All sampled firms are designated SMEs according to MSME act 2006 and have minimum five years of operational experience in the related business. The targeted manufacturing SMEs belong to the diversified industries such as basic metals, fabricated metals, machinery and equipments, food products and beverages. A total of 430 enterprises were approached for the research and 245owner or manager have supported and participated in the survey indicating a valid response rate of 56.9 percent.

Measure

The questionnaire used in the study is composed of two sections: firstly, the items are designed to assess firm attitude toward striple bottom practices and business performance. Secondly there spondents' demographic information comprising of age of the firm, type of the firm, size of the firm. The measurement items were developed from a review of literature (Vinodh and Joy, 2012; Torgusa *et al.,* 2012; Schoenhrr, 2012; Hubbard, 2009). The firms' attitude toward triple bottom line approach was measured by three core factors renamed environmental sustainability (Env_S) with five items on five-point scale (e.g., “Our enterprise is actively engaged in recycling and reuse of material/product” ranging from 1=strongly disagree to 5=strongly agree), economic sustainability (Econ_S) with four items on five-point scale (e.g. “Meeting the customers' deadline”) and social sustainability (Soc_S), three items with 5-point scale (e.g., “Maintaining workplace safety and occupational health” ranging from 1= strongly disagree to 5= strongly agree) were developed to assess its importance in triple bottom line

(3BL). Finally, business performance with five items on 5-point scale (e.g., "Product and process performance that are important to and directly serve your customers" ranging from 1 = strongly disagree to 5= strongly agree) were used to examine respondents' attitude toward business performance (B_Per).

Result and Analysis

In our study, we used structural equation modelling for confirmatory (hypothesis-testing) approach to analyze a conceptual framework bearing interrelationship among 3BL approach and causal relationship with business performance. SEM incorporates both latent and observed variables and explains multivariate relations for estimating point and indirect effects. Prior to confirmatory approach, factor analytic model {exploratory factor analysis (EFA) and confirmatory analysis (CFA)} was performed to examining pattern of correlation (covariance) between observed variables (Bentler, 1988).

Data Description

Figure 2 shows the average scores achieved on 'triple bottom line' approach (e.g. Econ_S, Env_S and Soc_S) and Business performance (B_Per) analysed on the basis ofresponses. It is generally agreed that these sustainability are based on the rational behavior of owners, partners and senior managers. The managers' rational attitude determines the firm's orientation toward the development of green and clean business environment.

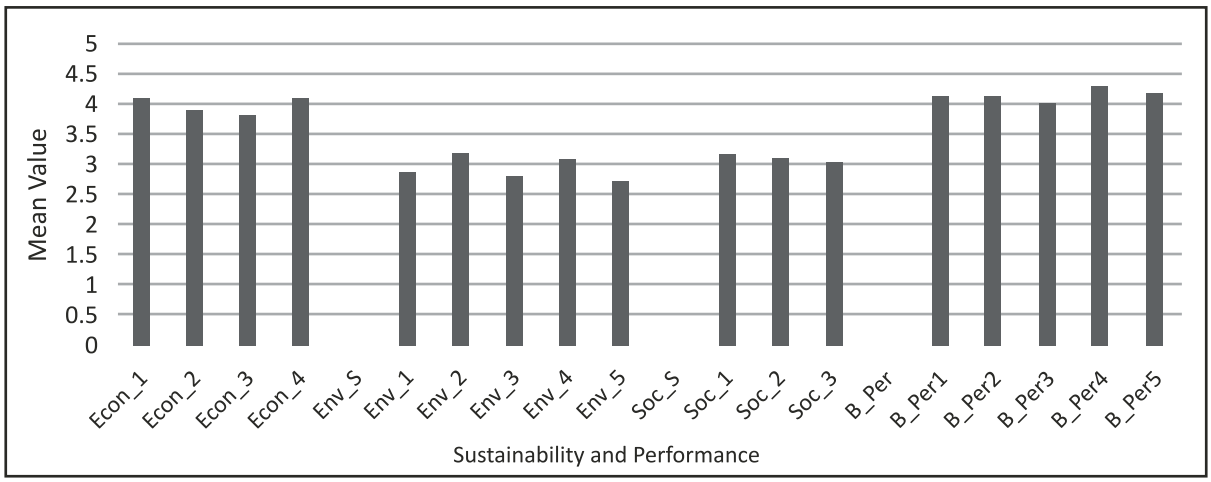

Figure 2: Triple bottom line approach & business performance.

The scores of attitudinal determinants are extremely high for economic sustainability (Econ_S) and business performance (B_Per), moderate for social (Soc_S) and environmental sustainability (Env_S).The scores for the domains of environmental sustainability (Env_S) indicates that the owners/managers are willing to mitigate the adverse effects of firm's operations on the environment.

Empirical validation of measures

The research used SPSS 19.0 for initial extraction of factors for conceptual framework of sustainable manufacturing practices in SMEs. Firstly, exploratory factor analysis was employed to identify the primary dimensions and to purify the factors. As a result, four factors have been extracted with eigen values greater than one and high factor loadings, namely environmental sustainability (Env_S), economic sustainability (Econ_S), social sustainability (Soc_S) and business performance (B_Per). There were few items from triple bottom line and business performance has been dropped due to their low factor loadings.

The psychometric properties of each item for these four factors are shown in Table 1. All factors have revealed satisfactory measurement properties such as factor loading, Cronbach's Alpha, internal consistency and convergent validity (AVE). As for environmental sustainability (Env_S, Cronbach's alpha =0.767, AVE= 0.60, IC=0.99), economic sustainability (Econ_S, Cronbach's alpha =0.815, AVE= 0.67, IC=0.99), Social sustainability (Soc_S, Cronbach's alpha =0.70, AVE= 0.50, IC=0.98) and Business Performance (B_Per= 0.701, AVE= 0.53, IC=0.99) (see Table 1).

The inter-construct correlation matrix (see Table 2) demonstrates that square root of average variance extracted (AVE) for each factor (on the diagonal) is higher than the corresponding inter-construct correlation. An examination of AVE values and the correlation estimates suggested the existence of discriminant validity and the validity of the factors of the measurement model.

Table 1: Psychometric statistics for the scales.

Items	**factor loading**	**Cronbach's Alpha**	**Internal consistency (IC)**	**Convergent validity (AVE)**
Env_1	.636	0.767	0.99	0.60
Env_2	.667			
Env_3	.908			
Env_4	.681			
Env_5	.941			
Econ_1	.728	0.815	0.99	0.67
Econ_2	.783			
Econ_3	.906			
Econ_4	.842			
Soc_1	.855	0.7	0.98	0.50
Soc_2	.603			
Soc_3	.641			
B_Per_1	.606	0.701	0.99	0.53
B_Per_2	.746			
B_Per_3	.660			
B_Per_4	.757			
B_Per_5	.735			
Env [Environmental sustainability]; Econ [Economic sustainability]; Soc [Social sustainability]; B_Per [Business Performance]				

Table 2: Inter Construct correlations and square roots of AVE of constructs.

Factor Correlation Matrix				
Factor	**Env_S**	**Econ_S**	**Soc_S**	**B_Per**
Env_S	**.818**			
Econ_S	.361	**.778**		
Soc_S	.348	.415	**.709**	
B_Per	.496	.564	.611	.726

Confirmatory factor analysis (CFA) has been performed using IBM AMOS 20.0 to test the measurement model and factors' uni-dimensionality (Hair et al. 1998). The results of confirmatory factor analysis for the full model are: $\chi 2$=259.57, df=160, ($\chi 2$)/f = 1.622, RMSEA = 0.049, GFI=0.91, CFI= 0.964. An examination of the goodness-of-fit statistics shows that most of the fit indices are within the recommended range, indicating acceptability of the measurement model.

Structural equation model and hypothesis testing

To validate the conceptual framework for triple bottom line approach and business performance, absolute fit indices statistics of structural model have been shown in Table 3 where all fit indices are within the recommended threshold range. So, it can be concluded that validity of both measurement and structural model have been established (Table 3).

The interrelationship among various 3BL approach of firm and its causal relationship with business performance has been established. Table 4 represent the estimate for each path (regression coefficients) and the corresponding p- value for the regression coefficients of each factor at 0.01 level of significance.

Table 3: Explanatory power and fit indices of structural model.

Absolute Fit Indices	Structural Model	Recommended Range[a]
($\chi 2$)/f	1.585	< 3
RMR	0.025	Close to 00
GFI	0.922	above or close 0.9
CFI	0.969	> 0.9
IFI	0.969	>0.9
RMSEA	0.049	<0.1

[a] :Tseng and Hung, 2013.

($\chi 2$)/f [chi-square/degree of freedom]; RMR [Root Mean Square Residual]; GFI [goodness of Fit Index]; CFI [Comparative fit Index]; IFI [Incremental Fit Index]; RMSEA [Root Mean Square Error of Approximation]

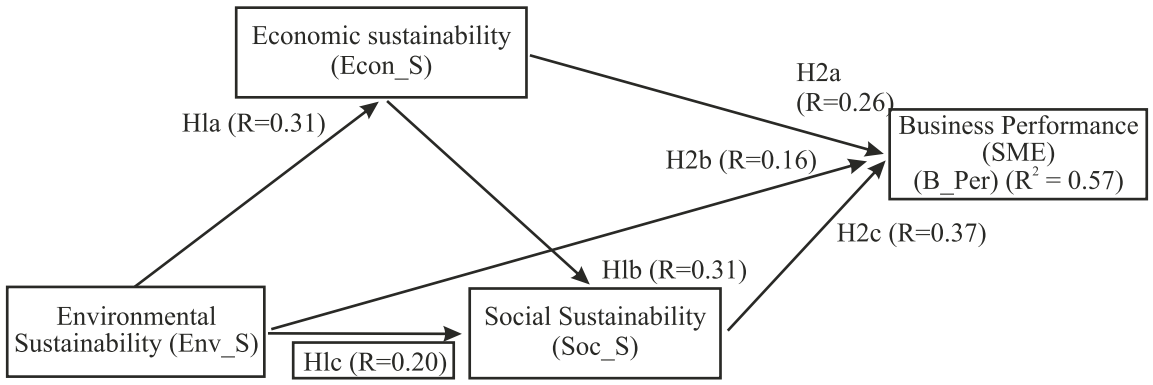

Figure 2: Structural model of triple bottom line and business performance.

Table 4: Standardized regression weights and SEM Results.

Hypothesis	Paths			Coefficient	P Value*	Results
H1a	Env_S	➔	Eco_S	0.313	0.001	Supported
H1b	Eco_S	➔	Soc_S	0.311	0.001	Supported
H1c	Env_S	➔	Soc_S	0.198	0.002	Supported
H2a	Eco_S	➔	B_Per	0.257	0.001	Supported
H2b	Env_S	➔	B_Per	0.162	0.001	Supported
H2c	Soc_S	➔	B_Per	0.368	0.001	Supported
*ρ 0.01 value						

Based on R-squared and estimated path coefficients for the structural model, three factors (Econ_S, Env_S and Soc_S) are significantly related to the business performance (B_Per). The model has also explained 57 percent of the variance for business performance (B_per) (as shown in Figure 3).Thus, it can be concluded that the role of 3BL activities in small firms of the country has been highlighted and framework for triple bottom line practices and business performance of small manufacturing firms has been presented.

Conclusion and Discussion

The study revealed that the sampled SMEs have shown significant orientation toward adoption of environmental and social sustainability and realized its relevance in 3BL practices. The research findings also validate 'triple bottom line' approach in manufacturing SMEs by establishing interrelationship among firm's sustainability(Severo *et al.,* 2014; Vinodh *et al.,* 2012), and contradict the traditional assumption that SMEs cannot develop environmental strategies owing to scarcity of resources. (e.g. Marcus and Geffen, 1998; Ramus and Steger, 2000; Sharma and Vredenburg, 1998). While evaluating the framework, it can be said that modern-days mall manufacturing firms have look forward for green initiatives by reducing, reusing and recycling of resources and support the economic sustainability by improving competitive advantage of firm. It has also been witnessed that environmental and economic sustainability has significant influence on societal sustainability of firms by maintaining workplace safety, training and sponsoring community initiatives of society. Overall, sustainability within the firms exists and each factory identified as important driver for sustainable manufacturing.

Predominantly, it has also been observed that environmental practices such as ISO 14001 and 3R methodology has created an opportunity for small firms to look forward for international tie-ups with multinational industrial buyers in order to increase their customers' reach. The study also noted that small firms are receiving wider social acceptance in terms of brand value among competitors who are focusing on social practices such as employee training, workplace safety and providing sponsorship to community initiatives.

Considering the absolute impact, it has been confirmed that 3BLapproachexhibits strong influence on business performance and implementation of 3BL practices support a clean brand image and competitive advantage among sampled firms. Though SMEs are generally found at a resource disadvantage but their willingness towards adoption of 'triple bottom line' practices have been witnessed to be high. Therefore, policy makers and practitioners need to explore feasible solution to maintain the momentum of SMEs toward green performance and provide necessary facilities to overcome their monetary losses which may incurred during the initial stage of implementation of sustainability into their practices. It's also necessary to create awareness toward green consumption among industrial and direct customers to bridge the gap

between the prevailing conditions and future expectations of clean and green environment from small manufacturing firms.

Limitations and future research

As with any study, findings of the research considered along with its limitations. The research covered small sample of a large sector of the country and considered cross-sectional data to analyze the causal relationship among sustainability practices and firms' performance. The research doesn't include the role of entrepreneurial orientation (EO) toward sustainable practices, which could have direct and mediated effect on firm performance and explain the firm's position toward greener initiatives in more effective manner. Considering the context of research, internal environment issues like financial capability, innovativeness and risk taking ability have not taken into account (Miller, 2007). It is suggested that future research should include EO and internal environment issues as mentioned above to shed light on causal relationship and overall impact on firm (Radcliffe and Klein, 2002, Wales *et al.,* 2011). It is also advisable to conduct research on longitudinal data for identifying the relationship between government policies and firm's approach towards cleaner production.

Appendix 1

Factors and Items		
Factors	**Measure Source**	**Items**
Economic sustainability (Econ_S)	Vinodh and Joy, 2012; Torgusa *et al.,* 2013; Schoenhrr, 2012	Meeting the customers' deadline (Eco_1)
		Adjustment in the product and process as per customer modifications (Eco_2)
		Reduction of overall cost i.e. production, raw material, labor etc of the firm (Eco_3)
		Competitive Advantage (Eco_4)
Environmental sustainability (Env_S)	Vinodh and Joy, 2012; Torgusa *et al.,* 2013; Schoenhrr, 2012	Implementation of Environment Management System (EMS) i.e. 14001 on environmental aspects. (Env_1)
		In reducing direct or indirect pollution i.e. air/water. (Env_2)
		In recycling and reuse of material/product. (Env_3)
		In waste management.(Env_4)
		In energy conservation. (Env_5)
Social sustainability (Soc_S)	Vinodh and Joy, 2012; Torgusa *et al.,* 2013	Maintaining workplace safety and occupational health (Soc_1)
		Training and development of employees (Soc_2)
		Sponsorship of community initiatives (Soc_3)
Business Performance (B_Per)	Hubbard, 2009	Operational effectiveness i.e. efficiency, innovation (Org_1)
		Product and process performance that are important to and directly serve your customers (Org_2)
		Customer satisfaction level for your product which is similar to that of your competitors (Org_3)
		Market Share (Org_4)
		Financial performance i.e. profit, sales etc (Org_5)

References

Arago´ n-Correa, J.A., Hurtado-Torres, N., Sharma, S., Garcı´a-Morales, V.J. 2008. Environmental strategy and performance in small firms: A resource-based perspective. *Journal of Environmental Management,* 86, 88–103. 342630868

Bentler, P. M. 1988. Causal modeling via structural equation systems. In J. R. Nesse lroade & R. B. Cattell (Eds.), *Handbook of multivariate experimental psychology* 2nd ed., pp. 317–335.

Burke, S. Gaughran, W.F. 2007. Developing a framework for sustainability management in engineering SMEs. *Robotics and Computer-integrated Manufacturing,* 23, 696-703.

Carlson-Skalak, S. 2000. E Media's Global zero: design for environment in a small firm. *Interfaces*, 30, 66–83.

Christmann, P. 2000. Effects of 'best practices' of environmental management on cost advantage: the role of complementary assets. *Academy of Management Journal,* 43, 663–680.

Clark, W.C. 1989. Managing planet earth. *Scientific American,* 261, 47–54.

Consoli, D. 2012. Literature analysis on determinant factors and the impact of ICT in SMEs. *Procedia Social and Behavioral Sciences*, 62, 93–97.

Daly, H.E., Cobb, Jr. J.B. 1994. For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future. *Beacon Press, Boston*.

DCMSME, 2009. Micro, small and Medium Enterprises in India: an Overview. Available from: http://www.dcmsme.gov.in/ssiindia/MSME_OVERVIEW09.pdf.

Fassin, Y. 2005. The reasons behind non-ethical behavior in business and entrepreneurship. *Journal of Business Ethics*, 60, 265–279.

Gibcus, P., Vermeulen, P. A. M., de Jong, J. P. J. 2009. Strategic decision-making in small firms: A taxonomy of small business owners. *International Journal of Entrepreneurship and Small Business*, 7, 74-91.

Goodland, R., Daly, H. 1996. Environmental sustainability. *Universal and nonnegotiable ecological society of America, Ecological Applications*, 6, 1002-1017.

Hair, J.F, Anderson, R.E., Tatham, R.L., Black, W.C. 1998. *Multivariate Data Analysis*, 8th ed. Prentice-Hall, Inc., Upper Saddle River, NJ.

Hannafey, F.T. 2003. Entrepreneurship and ethics: A literature review. *Journal of Business Ethics,* 46, 99–110.

Hillary, R. 2000. Small and Medium-Sized Enterprises and the Environment. *Greenleaf, Sheffield.*

Hubbard, R. 2009. Measuring Organizational Performance: Beyond the Triple Bottom Line. *Business Strategy and the Environment,* 19, 177–191.

Lee, H.H., Kim, J.W. 2009. Current status of CSR in the realm of supply management: the case of the Korean electronics industry. *Supply Chain Management: An International Journal*, 14, 138–148.

Marcus, A.A., Geffen, D. 1998. The dialectics of competency acquisition: pollution prevention in electric generation. *Strategic Management Journal,* 19, 1145–1168.

Micro Small Medium Enterprise Annual Report 2011-12. Available from: http://www.msme.gov.in

accessed on 12 May 2015.

Miller, K. 2007. Risk and rationality in the entrepreneurial process. *Strategic Entrepreneurship Journal,* 1, 57–74.

Ministry of Environment and Forests (Internet), 2009 (cited 06.10.14). Available from: http://envfor.nic.in/.

Pagell, M., Gobeli, D. 2009. How plant managers' experiences and attitudes toward sustainability relate to operational performance. *Production and Operations Management,* 18, 278–299.

Quental, N., Lourenco, J.M., Da Silva, F.N. 2011. Sustainability: characteristics and scientific roots. *Environment, Development and Sustainability,* 13, 257–276.

Radcliffe, N., Klein, W. 2002. Dispositional, unrealistic and comparative optimism: Differential relations with the knowledge and processing of risk information and beliefs about personal risk. *Personality and Social Psychology Bulletin,* 28, 836–846.

Ramus, C.A., Steger, U. 2000. The roles of supervisory support behaviors and environmental policy in employee 'eco initiatives' at leading-edge European companies. *Academy of Management Journal,* 43, 605–626.

Rao, P., Holt, D. 2005. Do green supply chains lead to competitiveness and economic performance? *International Journal of Operation and Production Management,* 25, 898-916.

Reimers, H., Connie, I. 2010. Sustainability through Profitability: The Triple Bottom Line. *Kimmel Education and Research Center,* Available from: http://digitalcommons.unl.edu/kimmelpapers/9

Russo, M.V., Fouts, P.A. 1997. A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal*, 40, 534–559.

Santos, J.B., Brito. L.A. L. 2012. Toward a subjective measurement model for firm performance. *Brazilian Administration Review (BAR)*, 9, 95–117.

Schaper, M. 2002. Small firms and environmental management: predictors of green purchasing in Western Australian pharmacies. *International Small Business Journal*, 20, 235–251.

Schoenherr, T. 2012. The role of environmental management in sustainable business development: A multi-country investigation. *International Journal of Production Economics,* 140, 114-128.

Seurig, S., Sarkis, J., Muller, M., Rao, P. 2008. Sustainability and supply chain management: an introduction to the special issue. *Journal of Cleaner Production*, 16, 1545–1551.

Severo, E.A., de Guimarães, J.C.F., Dorion, E.C.H., Nodari, C. H. 2014. Cleaner production, environmental sustainability and organizational performance: an empirical study in the Brazilian Metal-Mechanic industry. *Journal of Cleaner Production*, 98, 118-125.

Sharma, S., Vredenburg, H. 1998. Proactive corporate environmental strategy and the development of competitively valuable organizational capabilities. *Strategic Management Journal*, 19, 729–753.

Singh, S., Olugu, E.U., Fallahpour, A. 2013. Fuzzy-based sustainable manufacturing assessment model for SMEs. *Clean Technology Environment Policy,* 16, 847-860.

Subrahmanya, M.H.B., Mathirajan, M., Krishnaswamy, K.N. 2010. Importance of technological innovation for SME growth: Evidence from India. *Working paper of World Institute for Development Economics Research*, 03/2010.

Torugsa, N. A., O'Donohue, W., Hecker, R. 2012. Capabilities, Proactive CSR and financial performance of SMEs: Empirical Evidence from Australian Manufacturing Industry Sector. *Journal of Business Ethics,* 109, 483-500.

Tseng, S.C., Hung, S.W. 2013. A framework identifying the gaps between customers' expectations and their perceptions in green products. *Journal of Cleaner Production,* 59, 174-184.

Tsoulfas, G., Pappis, C. 2006. Environmental principles applicable to supply chains design and operation. *Journal of Cleaner Production*, 14, 1593-602.

UNCTAD 1996. Incentives and Disincentives for the Adoption of Sustainable Development by Transnational Corporations. *United Nations Conference on Trade and Development*. Geneva, United Nations.

Vinodh, S., Jayakrishna, K., Joy, D. 2012. Environmental impact assessment of an automotive component using eco-indicator and CML methodologies. *Clean Technologies and Environment Policy*, 14, 333–344.

Waddock, S.A., Graves, S.B. 1997. The corporate social performance-financial performance link. *Strategic Management Journal,* 18, 303–319.

Wagner, M. 2005. How to reconcile environmental and economic performance to improve corporate sustainability: corporate environmental strategies in the European paper industry. *Journal of Environmental Management,* 76, 105–118.

Wales, W., Gupta, V., Mousa, F.T. 2011. Empirical research on entrepreneurial orientation: An assessment and suggestions for future research. *International Small Business Journal*.

World Commission on Environment and Development, 1987. Our Common Future. New York: Oxford University Press, pp. 8.

Yang, C.J., Chen, J.L. 2011. Accelerating preliminary eco-innovation design for products that integrates case-based reasoning and TRIZ method. *Journal of Cleaner Production*, 19, 998-1006.