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ECONOMIC SUSTAINABILITY IN PRODUCTION PROCESS BY MANUFACTURING INDUSTRIAL UNITS IN VIRUDHUNAGAR DISTRICT

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ABSTRACT: *Implementation of economic sustainability has become a critical issue for manufacturing sector in Virudhunagar district. In order to survive in today's competitive world implementation of economic sustainability has become a necessity. Implementation of economic sustainability in production process is brings lot of social and environmental benefits to the manufacturing industries. Such benefits include reduce the unwanted production and other costs, goodwill of the industry and improve business profile. The study brings forth that the implementation of more economic sustainability depending on the form of organization, amount of investment and category of industry shall enable their faster development in sustainable way.*

Keywords: *Economic sustainability, implementation, manufacturing, industry, production process.*

1. INTRODUCTION

Indian manufacturing sector have become the engine of economic growth in India with their effective, efficient, flexible and innovative entrepreneurial spirit. The micro, small and medium enterprises constitute a very important segment of the Indian economy. MSME's contribution to the development of our economy is significant as it evident in terms of MSMEs being the major constituent sector in the manufacturing system, employment generation and GDP. Sustainability reporting is the practice of measuring, disclosing and being accountable for organizational performance towards the goal of sustainable development and is considered synonymous with other terms used to describe for accounting for economic, environmental and social impacts such as triple bottom line or corporate responsibility. Smith and McDonald explain that: environmental sustainability requires that development is compatible with environmental friendly processes; *economic sustainability means it is economically feasible* and social sustainability means it is socially acceptable. This research paper discusses the review of related literature, methodology, objectives of the study and implementation of economic sustainability in production process by manufacturing industrial units in Virudhunagar district.

2. REVIEW OF RELATED LITERATURE

A. D. Basiago, in his study titled Economic, social, and environmental sustainability in development theory and urban planning practice, it concludes that while these examples from the developing world cannot be directly translated to cities in the

developed world, they do indicate in a general sense the imaginative policies that any society must foster if it is to achieve ‘urban sustainability’.

Norsiah Hamia, Mohd Razali Muhamadb, Zuhriah Ebrahimb, in their article entitled, *The Impact of Sustainable Manufacturing Practices and Innovation Performance on Economic Sustainability*” the research reported in this paper aims to analyze the effect of SMP on economic sustainability (ES) and the mediated effect of SMP on ES during innovation performance (IP). The results have empirically proven the role of SMP and IP in influencing the economic performance. It suggested that instead of acting on well-intentioned influence or reacting to external stress, firms should clearly define and grasp economic opportunities gained from being eco-friendly and socially responsible.

Martin Janicke, in his paper titled *Green growth: From a growing eco-industry to economic sustainability*, explore that there are many questionable assumptions in the discussion of economic growth. One of them is the idea that governments are able to achieve sustained high growth. Another one is to believe that the solution to pressing financial and social problem centers on higher growth. It is also about radical “de-growth” in products and processes that undermine long-term living and production conditions. This paper describes some best practice cases of “green growth” and the conceptual generalizations given by the OECD and other established institutions in Europe and Asia. It traces the transformation of the concept of “green growth” and evaluates the strategy that accompanies it.

Srinivasa Kumar, D. Prasad K.V.S. and Prasada Rao S, in their study titled *Sustainable Trends and Policies of MSME in Economic Development in India: An Empirical Study*, reveals that MSME plays essential role in the Indian manufacturing sector and have become the engine of economic growth in India. To keep this growth engine on the right way and direction it is time to put emphasis on formulation of MSME friendly policies, improvement of proper infrastructure, conducive operating environment, securing peace and security, arranging proper finance, efficient manager and arranging appropriate modern technology. Considering MSMEs contribution towards every aspect of economic development it should be considered at equal recognition with agriculture.

3. METHODOLOGY

The present paper is based on both the secondary and primary data collected relating to the adoption of economic sustainability in production process by manufacturing industrial units. The secondary data collected provides background and supportive information relating to the study. Primary data are also collected through a statistical survey with various manufacturing industrial units in Virudhunagar district on matters relating to their profile and the implementation of economic sustainability in production process by manufacturing industries. A formal enquiry was made using interview schedule designed for the purpose, from 400 manufacturing industrial units selected conveniently. It is undertaken with the objective to analyze the implementation of economic sustainability in production process by manufacturing industrial units.

3.1 LIMITATIONS OF THE STUDY

This study examined only the activities and practices identified based on economic sustainability in production process on the preliminary study and secondary data. This study is focused only manufacturing industrial units in Virudhunagar district only.

4. ANALYSIS AND DISCUSSION

The study identified three economic sustainability in production process by the manufacturing industries, namely, improving quality of products and processes, control of cost within limits and enabling flexibility in operation. The analysis of data shows that, in case of the aspect ‘economic sustainability’, out of the 400 respondents, a majority portion of 392 respondents, representing 98%, adopt production of reliable products for consumption, followed by 387 respondents (96.75%) adopt production of durable products. In the same way majority of 343 respondents, representing 85.75%, were not adopt reworking and reuse of the scraps to conserve raw material.

The analysis of the data also disclosed that out of 400 respondents, a great majority of 368 respondents, representing 92%, adopt reduction of overhead cost, followed by 288 respondents (72%) adopt keeping the rework cost to the minimum and so on. In the same way majority of 171 respondents, representing 42.75%, were not adopt bring down the setup cost as far as possible.

The examination of the data collected revealed that out of the 400 samples, a great majority of 345 respondents, representing 86.25%, adopt developing new product that increase consumption value, followed by 337 respondents (84.25%) adopts improving consumption value of existing products. The following table shows the economic sustainability in production process by manufacturing industries in Virudhunagar district.

TABLE No. 1
ECONOMIC SUSTAINABILITY IN PRODUCTION PROCESS

S. No.	Practices	Adoption		Total
		Yes	No	
<i>Improving quality of products and processes</i>				
1.	Production of reliable products for consumption	392	8	400
		98.00	2.00	100
2.	Production of durable products	387	13	400
		96.75	3.25	100
3.	Reworking and reuse of the scraps to conserve raw material	57	343	400
		14.25	85.75	100
<i>Control of cost within limits</i>				
4.	Keeping cost of carrying and storing material	315	85	400
		78.75	21.25	100
5.	Bring down the setup cost as far as possible	229	171	400
		57.25	42.75	100
6.	Reduction of overhead cost	368	32	400
		92.00	8.00	100
7.	Keeping the rework cost to the minimum	288	112	400
		72.00	28.00	100

8.	Reducing wages per unit by reducing ideal time to zero	275	125	400
		68.75	31.25	100
Enabling flexibility in operation				
9.	Improving consumption value of existing products	337	63	400
		84.25	15.75	100
10.	Adoption of technology that increase machine life	324	76	400
		81.00	19.00	100
11.	Developing new product that increase consumption value	345	55	400
		86.25	13.75	100

Source: Primary data.

The above table clearly shows that the economic sustainability in production process by manufacturing industries adopted by a great majority of 98% of industries is 'production of reliable products for consumption' followed by the economic sustainability are 'reduction of overhead cost' (92%), and 'developing new product that increase consumption value' (86.25%).

4.1 RELATIONSHIP BETWEEN ADOPTION OF ECONOMIC SUSTAINABILITY AND PROFILE VARIABLES

The study further examined the relationship between adoption of economic sustainability and profile variables of the manufacturing industries. In order to ascertain the existence of the relationship, null and alternate hypothesis were formed for testing as under:

H0: There is no significant relationship between the adoption of economic sustainability in production process and profile variables.

H1: There is a significant relationship between the adoption of economic sustainability in production process and profile variables.

One way ANOVA test was employed to verify the null and alternate hypothesis. The results of the test are shown in the following table along with F value, P value and Result.

TABLE No. 2
RELATIONSHIP BETWEEN ADOPTION OF ECONOMIC SUSTAINABILITY AND LOCATION

S. No	Independent variables	Dependent variable	Df	F-test	P-value	Result
1.	Location	Production of reliable products for consumption	1	10.951	.001	Reject
2.	Location	Production of durable products	1	18.352	.000	Reject
3.	Location	Reworking and reuse of the scraps to conserve raw material	1	102.490	.000	Reject
4.	Location	Keeping cost of carrying and storing material	1	103.039	.000	Reject
5.	Location	Bring down the setup cost as far as possible	1	525.627	.000	Reject

6.	Location	Reduction of overhead cost	1	28.248	.000	Reject
7.	Location	Keeping the rework cost to the minimum	1	167.245	.000	Reject
8.	Location	Reducing wages per unit by reducing ideal time to zero	1	210.950	.000	Reject
9.	Location	Improving consumption value of existing products	1	66.125	.000	Reject
10.	Location	Adoption of technology that increase machine life	1	176.966	.000	Reject
11.	Location	Developing new product that increase consumption value	1	55.041	.000	Reject

Source: Primary data.

The above table makes it clearly shows that since the P value is less than 0.05 in case of location at 5 per cent level of significance, the null hypothesis is rejected. Hence, it is concluded that there is relationship between the adoption of economic sustainability in production process and location of the manufacturing industries.

TABLE No. 3
RELATIONSHIP BETWEEN ADOPTION OF ECONOMIC SUSTAINABILITY AND FORM OF ORGANIZATION

S. No	Independent variables	Dependent variable	Df	F-test	P-value	Result
1.	Form of Organization	Production of reliable products for consumption	4	1.122	.346	Accept
2.	Form of Organization	Production of durable products	4	1.860	.117	Accept
3.	Form of Organization	Reworking and reuse of the scraps to conserve raw material	4	9.098	.000	Reject
4.	Form of Organization	Keeping cost of carrying and storing material	4	120.499	.000	Reject
5.	Form of Organization	Bring down the setup cost as far as possible	4	276.823	.000	Reject
6.	Form of Organization	Reduction of overhead cost	4	191.970	.000	Reject
7.	Form of Organization	Keeping the rework cost to the minimum	4	254.198	.000	Reject
8.	Form of Organization	Reducing wages per unit by reducing ideal time to zero	4	482.045	.000	Reject
9.	Form of Organization	Improving consumption value of existing products	4	92.392	.000	Reject
10.	Form of Organization	Adoption of technology that increase machine life	4	14.639	.000	Reject
11.	Form of Organization	Developing new product that increase consumption value	4	92.872	.000	Reject

Source: Primary data.

The above table brings to notice that since the P value is more than 0.05 in case of form of organization (.346) and (.117) at 5 per cent level of significance, the null hypothesis is accepted. Hence, it is concluded that there is no relationship between the adoption of economic sustainability like, production of reliable products for consumption, production of durable products and form of organization. It also reveals that since the P value is less than 0.05 in case of location at 5 per cent level of significance, the null hypothesis is rejected. Hence, it is concluded that there is relationship between the adoption of economic sustainability and form of the organization of the industries.

TABLE No. 4
RELATIONSHIP BETWEEN ADOPTION OF ECONOMIC SUSTAINABILITY AND AMOUNT OF INVESTMENT

S. No	Independent variables	Dependent variable	Df	F-test	P-value	Result
1.	Amount of investment	Production of reliable products for consumption	5	1.837	.105	Accept
2.	Amount of investment	Production of durable products	5	3.070	.010	Reject
3.	Amount of investment	Reworking and reuse of the scraps to conserve raw material	5	16.599	.000	Reject
4.	Amount of investment	Keeping cost of carrying and storing material	5	820.292	.000	Reject
5.	Amount of investment	Bring down the setup cost as far as possible	5	212.960	.000	Reject
6.	Amount of investment	Reduction of overhead cost	5	823.372	.000	Reject
7.	Amount of investment	Keeping the rework cost to the minimum	5	319.830	.000	Reject
8.	Amount of investment	Reducing wages per unit by reducing ideal time to zero	5	211.564	.000	Reject
9.	Amount of investment	Improving consumption value of existing products	5	.000	.000	Reject
10.	Amount of investment	Adoption of technology that increase machine life	5	27.957	.000	Reject
11.	Amount of investment	Developing new product that increase consumption value	5	1136.074	.000	Reject

Source: Primary data.

The above table discloses that the P value is more than 0.05 in case of amount of investment (.105) at 5 per cent level of significance, the null hypothesis is accepted. Hence, it is concluded that there is no relationship between the adoption of economic sustainability like, production of reliable products for consumption and amount of

investment. It also brings to notice that since the P value is less than 0.05 in case of amount of investment at 5 per cent level of significance, the null hypothesis is rejected. Hence, it is concluded that there is relationship between the adoption of economic sustainability and amount of investment of the manufacturing industries in Virudhunagar district.

TABLE No. 5
RELATIONSHIP BETWEEN ADOPTION OF ECONOMIC SUSTAINABILITY AND CATEGORY OF THE INDUSTRIES

S. No	Independent variables	Dependent variable	Df	F-test	P-value	Result
1.	Category	Production of reliable products for consumption	2	2.039	.132	Accept
2.	Category	Production of durable products	2	3.378	.035	Reject
3.	Category	Reworking and reuse of the scraps to conserve raw material	2	17.915	.000	Reject
4.	Category	Keeping cost of carrying and storing material	2	260.707	.000	Reject
5.	Category	Bring down the setup cost as far as possible	2	397.744	.000	Reject
6.	Category	Reduction of overhead cost	2	299.565	.000	Reject
7.	Category	Keeping the rework cost to the minimum	2	655.180	.000	Reject
8.	Category	Reducing wages per unit by reducing ideal time to zero	2	1638.577	.000	Reject
9.	Category	Improving consumption value of existing products	2	180.803	.000	Reject
10.	Category	Adoption of technology that increase machine life	2	26.262	.000	Reject
11.	Category	Developing new product that increase consumption value	2	174.415	.000	Reject

Source: Primary data.

The above table brings to notice that the P value is more than 0.05 in case of category of industry (.132) at 5 per cent level of significance, the null hypothesis is accepted. Hence, it is concluded that there is no relationship between the adoption of economic sustainability like, production of reliable products for consumption and category of industry. It also discloses that since the P value is less than 0.05 in case of category of industry at 5 per cent level of significance, the null hypothesis is rejected. Hence, it is concluded that there is relationship between the adoption of economic sustainability and category of industry in the study area.

5. CONCLUSION

The manufacturing industries in this 21st century started implementing more and more economic practices. They felt the need for doing their venture in economic sustainability manner. The important modes of implementation of economic sustainability by the manufacturing industries are production of reliable products for consumption, production of durable products, reduction of overhead cost, keeping cost of carrying and storing material, keeping the rework cost to the minimum, developing new product that increase consumption value and improving consumption value of existing products. The manufacturing industries need to implement economic sustainability not only to achieve lot of social and environmental benefits to the manufacturing industries but also to protect the environment. Thus the implementation of more economic sustainability depending on the location, form of organization, amount of investment and category of industry shall enable their faster development in sustainable way.

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