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A Relational Study of Knowledge Transfer and Green Supply Chain Practices on Organizational Performance

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Abstract:- Rapid worldwide industrialisation and industrial waste severally polluted and spoiled our environment which caused icebergs melt, ozone depletion , green house gas effect and. so on. Pollution not only affect the health of human beings but also it is a burden on world environment. Due to the Promotion of environmental awareness around the world along with environmental laws and regulations like WEEE(Waste electrical and electronic equipments), RoHS(Restrictions of hazardous substances directives) , EuP(Energy rising products directives) companies faced unprecedented challenges in international market. To cope with the challenges and changes organisation should carry on the external and internal knowledge transfer in order to improve their creativity and innovativeness Researchers (Vachan & klassen) explored that firms were able to improve their performance upon sharing environmental required relative information and joint planning environment related solution among upstream suppliers and downstream customers. The objective of the study is to establish positive relationship between knowledge transfer and Green supply chain practices on organizational performances mainly on environmental and economic performances..The GSCM practices are able to reduce costs in waste and environmental safety which can increase economical performance but lots of funds are required to transfer the green knowledge transferring, to educate staffs, in constructing well developed communication and network.

***Keywords**:- Green Supply Chain Performance, Knowledge Transfer, WEEE, RoHS, EuP, Icebergs Melt, Ozone Depletion.*

I. INTRODUCTION

Organisation need to adjust with environmental changes and come forward rapidly towards internal and external knowledge transfer to increase their creativity and innovativeness. The two factors which are critical for knowledge transfer are knowledge transfer motivation and trust among partners. knowledge exchange in supply chain management means know how in strategic level and information regarding operational level. Knowledge transfer plays really an important role in supply chain management. knowledge transfer on supply chain management are depended on methods and it's type of knowledge sharing . Depending on the type of supply chain knowledge transfer is divided into two construct – "information quality ", "information sharing". When undistorted and instant market knowledge is available in every supply chain node then effectiveness and efficiency could improve during learning process. Implicit knowledge is much easier to pass on than explicit knowledge. The timely provision of accurate reliable knowledge transfer not only can strengthen the relationship among different supply chain partners, and avoid distorted and incomplete information which may lead to inefficient operations (Larson, 1994; Lee et al., 1997) and this is demonstrated as " information quality". Whereas critical and proprietary levels of communication complete, adequate, and reliable information exchange among supply chain partners are called "information sharing". Firms always share information with their partners to reduce supply chain risk and the process of knowledge transfer is ambiguous as supply chain partners have less knowledge towards environmental management which will affect on firms performance. Pollution control technology of production/process correction is ambiguous with tacit knowledge exchange and is hard to be copied .There are different advanced environmental management practices such as green manufacturing, green procurement, green packaging, green and reverse logistics.. To manage these integration of different green practices constructions of information sharing and knowledge transfer network among manufacturers, suppliers and customers are required. The strength of knowledge transfer can only reflect when there is interactive information network with mutual trust among the organisation and this will help to reduce the risk of information asymmetry among supply chain partners . Supply chain partners build long-term and joint-planning partnership to improve their performances.

According to Zhu et al. (2004) environmental performance and economical performance are two most important constructs of organizational performance other than social and operational performances. Economical performance focused on the reducing material waste cost, increasing profitability, increasing sales to green product, environmental disaster fine. Whereas environmental performance focused on reduction of pollutants and emission of hazardous gases and waste.

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II. RESEARCH DESIGN

The research will be explorative in nature. For making hypothesis we need to consider two main important construct of knowledge transfer-information sharing and information quality which firm can implement for the betterment of green supply chain performance.

After summarizing the reviews and different interpreted result the following hypothesis can be made:

- H1: Where there is higher level of information sharing in knowledge transfer in GSCM , there is higher level of positive economical performances in organizations.
- H1A: Where there is higher level of information quality in knowledge transfer in GSCM , there is higher level of positive economical performances.
- H2: Where there is higher level of information sharing in knowledge transfer in GSCM there is higher level of environmental performances
- H2A: Where there is higher level of information quality in knowledge transfer in GSCM there is higher level of environmental performances.
- H3: Where there is higher level of information sharing in knowledge transfer in GSCM , there is lower level of negative economical performances in organizations.
- H3A: Where there is higher level of information quality in knowledge transfer in GSCM , there is lower level of negative economical performances.

➢ *Sampling Method and Sample Size :*

Adapted 5 point Likert scale for evaluation. Random convenience sampling was used in this research and the data used in this study are the responses of survey questionnaire from managers, supervisors and engineers in production, quality assurance department and also decision makers worked as a change agent (whoever was available).

- *Sample Size:*

75 managers, engineers, supervisors in middle ,lower, big scale electrical and electronic industries in and around Bangalore.

All data are collected from ISO 140001 firms of Electrical and Electronic industries in and around Bangalore. 100questionnaires were filled and after eliminating 25 invalid data, there were 75 valid data.

- *Data Collection Method*

Primary data are collected through survey questions. Data are collected through mail and some data through personal interview.

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III. RESEARCH ANALYSIS

This research is analyzed by reliability and validity check .

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1.Do you inform prior to your supplier about your sustainable needs?	189.49	2810.883	.503	.	.985
2. Do your trading partners share proprietary information with your company?	190.53	2802.373	.576	.	.985
3.Do you share information with your trading partners time to time?	190.36	2792.317	.551	.	.985
4. Do the customers are aware about your sustainability concern drive?	190.45	2802.982	.535	.	.985
5 Do you share information with your trading partners accurately?	190.53	2797.182	.521	.	.985
6. Do all of your manufacturing unit staffs are shared the detail information about the product and the process?	190.35	2781.047	.627	.	.985
7.Information exchanged between us and trading partner are reliable.	190.53	2800.356	.527	.	.985
8.Information exchange between us and our trading partner are whole and complete.	190.53	2806.029	.511	.	.985
8.Information exchange between us and our trading partner are adequate.	190.51	2806.880	.514	.	.985
9 Information exchange between us and our trading partner are timely	190.43	2798.317	.578	.	.985
10. knowledge transfer helps in reduction of waste materials.	190.47	2794.256	.670	.	.985
11. knowledge transfer helps in reduction of C footprint.	190.44	2788.472	.617	.	.985
12. knowledge transfer helps in reduction of emission of green house gas.	190.48	2781.596	.691	.	.985
13.Decrease the energy consumption cost.	190.27	2790.396	.580	.	.985
14.Decraese the penalty for waste discharge.	190.63	2801.842	.594	.	.985
15.Decrease the cost of material purchasing.	190.45	2803.075	.592	.	.985
16.increase in operational cost	190.60	2805.108	.630	.	.985
17. increase of training cost	190.43	2790.237	.659	.	.985
18. Increase the campaigning cost among customers to aware them about the green product and green process of the compnay	190.66	2799.619	.716	.	.985

Table 1

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Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	18	100.0
	Excluded[a]	0	.0
	Total	18	100.0

Table 2

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.985	.986	17

Table 3

This research has analyzed the reliability and validity of the questionnaire. The reliability analysis of each construct is shown in table. as Cronbach's _ is .985 with high acceptance value ensures that each construct of this research questionnaire is compliance with the requirements of internal consistency.

To check **validity** of this questionnaire **factor analysis** for every Construct is done with factor loading greater than 0.79, which meets the standard of minimum absolute value and can explain over 79% of variation. It is proved that all construct of this research met with validity requirements constaint.

- *Data Analysis:*

- *Information Sharing:*

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total	Percentage
1.Do you inform prior to your supplier about your sustainable needs?	9(12%)	17(23%)	19(25%)	15(20%)	15(20%)	75	100
2. Do your trading partners share proprietary information with your company?	15(20%)	45(60%)	8(10%)	6(8%)	2(2%)	75	100
3.Do you share information with your trading partners time to time?	21(28%)	32(42%)	6(8%)	9(12%)	8(10%)	75	100
4. Do the customers are aware about your sustainability concern drive?	34(45%)	26(35%)	8(10%)	4(5%)	4(5%)	75	100
5 Do you share information with your trading partners accurately?	26(35%)	23(30%)	8(10%)	11(15%)	8(5%)	75	100
6. Do all of your manufacturing unit staffs are shared the detail information about the product and the process?	26(35%)	38(50%)	2(3%)	8(10%)	2(2%)	75	100

Table 4

Proper and timely information sharing is the important part of the business .Companies who are dealing with Green supply chain management they should share the raw material specification with the green partners.9 respondents representing 12% and 17 respondent representing 60% strongly agreed and agreed that supplier should be shared the sustainable needs of the company in advance, whereas 19 people are not sure and 30 people representing (15%+ 15%) disagreed and highly disagreed with the statement that company should give prior specification of the product to its suppliers . Moreover trading partners should share proprietary information with company so that before making any contract company may aware of their profile. 15 respondent and 45 respondent representing 20% &60% respectively highly agreed and agreed that comments whereas 10% are not sure and 6 and 2 respondents representing 8% and 2% don't think that suppliers proprietary information should be shared with company for making any contract.

Customer specially who are environmental concern if they are aware about the sustainable drive of the company , then the product will be much more popular and sell of the product will be more. that's the reason may be 34 respondents and 26 respondents representing 45% & 35% respectively are highly agreed and agreed on that statement but 8 respondents are reluctant . 11 and 8 respondents representing 15% and 5% respectively not at all convinced with the statement. According to them the information label on products is sufficient to attract environment conscious customers . Company should share the relevant information timely whenever required , even the staffs who are involved in production , should be shared with all information about the product and process.26 respondent and 38 respondents are highly agreed and agreed with the statement , whilst 3% not sure and 10%+2% are absolutely against this statement.

- *Information Quality:*

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total	Percentage
7.Information exchanged between company and trading partner are reliable.	15(20%)	45(60%)	8(10%)	6(8%)	2(2%)	75	100
8.Information exchange between company and their trading partner should be whole, complete and accurate.	26(35%)	34(45%)	8(10%)	6(8%)	9(12%)	75	100
9 Information exchange between company and their trading partner are timely .	26(35%)	26(35%)	11(15%)	8(10%)	4(5%)	75	100

Table 5

Information quality should be up to the mark. Information quality depends on three dimensions like accuracy, timeliness and reliable. In that context the survey tells in case information sharing accuracy is the important part of the business .26 and 34 respondents representing 35% & 45% respectively are highly convinced with the statement that non accurate information may mislead the process which incur huge cost for the company so appropriate and accurate information in case of green product and process which is almost new concept in market . information should me reliable to the company that may be the reason 34 respondent and 26 respondents representing 45% &35% are highly agreed and agreed whilst 8 people representing 5%+5% oppose the comments and 10% are not sure about it.

- *Environmental Performance:*

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total	Percentage
10. knowledge transfer helps in reduction of waste materials.	6(8%)	9(12%)	30(40%)	23(30%).	8(10%)	75	100
11. knowledge transfer helps in reduction of C footprint.	11(15%)	15(25%)	23(30%).	15(20%).	8(10%)	75	100
12. knowledge transfer helps in reduction of emission of green house gas.	20(27%)	10(13%)	15(25%)	11(15%).	15(20%)	75	100

Table 6

Knowledge transfer really helps to improve environmental performances. It helps in reduction of waste as proper and timely information and updated technology can help optimal use of resources and reduce the waste materials. In this survey 6 and 9 respondents representing 8% & 12% respectively highly agreed and agreed though 40% are not sure and 30% and 10% are not at all convinced with the statement. knowledge transfer may help in reduction of emission of green house gas but only 27% and 13% agreed whereas 25% are not sure while 11 and 15 people representing 15% and 20% are against the statement. It may be the reason that control of emission of green house gas does not depend upon knowledge transfer because being aware of harmful gas emission companies go for GSCM implementation. So 11 and 15 people representing 15% & 20% respectively are not agree that knowledge transfer is having any kind of contribution in reducing emission of hazardous gas.

- *Positive Economic Environment:*

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total	Percentage
13.Decrease the energy consumption cost.	34(45%)	15(25%)	8(10%)	8(10%)	8(10%)	75	100
14.Decraese the penalty for waste discharge.	28(37%)	21(28%)	9(12%)	8(10%)	10(11%)	75	100
15.Decrease the cost of material purchasing.	17(23%)	35(46%)	8(10%)	8(10%)	8(10%)	75	100

Table 7

By implementing GSCM in organization company may reduce energy consumption cost , reduce penalty for waste discharge and reduce the cost of material purchase. That's may be the reason 34, 28,17 respondents representing 45%,37%,23% are highly agreed with these statements but 8,9,8 people are not sure while 8,8,8 people representing 10%,10%,10% are disagreed with the statement.

- *Negative Economical Performance:*

Statement	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree	Total	Percentage
16.increase in operational cost..	30(40%)	30(40%)	8(10%)	8(10%)	8(10%)	75	100
17. increase of training cost	38(50%)	15(20%)	9(12%)	4(5%)	2(3%)	75	100
18. Increase the campaigning cost among customers to aware them about the green product and green process of the company.	17(23%)	35(46%)	8(10%)	8(10%)	8(10%)	75	100

Table 8

Knowledge transfer may increase the operational cost , campaigning cost and training cost. May be due to the reason 30, 38, 17 people representing 40%, 50%, 23% are highly agreed in different activities though 8,4,8 people representing 10%,5%,10% strongly oppose the statement .

IV. FINDINGS AND CONCLUSION

The study established that GSCM is beneficial for reducing hazardous gas emission, lower C footprint, reducing waste material helps to reduce the negative effect of industrialization indirectly,but knowledge transfer in that case is not so significant specially for those organization who already opted GSCM. Proper and timely relevant information sharing with the trading partners are really important aspect of business mainly in case of the companies who deals with GSCM practices. They should provide raw material specification to the green partners beforehand and will collect raw material from those suppliers who are EMS Certified. Information which are transferred should be reliable, accurate, timely. knowledge transfer though may reduce energy consumption cost, penalty for waste discharge and accidents, decrease the cost of material purchase due to its optimal use but still company has to bear huge amount of money in operational cost, campaigning cost to share their sustainable drive ,for transferring knowledge ,different training cost and so on.

Researcher would like to conclude that knowledge transfer though really required to implement GSCM practices in companies but they should aware also about the cost .Researcher did convenience sampling so different categories of companies are included in survey among them most are lower and mediocre range so time to time training and sharing each and every relevant information timely not always possible for them so researcher would recommend video conferencing and SAME TIME concept so that each and every information passes on to all the relevant people at a time and small menu driven package should be shared with them along with yearly twice or thrice workshops and seminars. Only those staffs who are directly involve with GSCM implementation in factory they should be given thorough training and shared all the relevant knowledge from experts. There should also have awareness among customers about the green packaging and green procurement then only we may expect

profit by implementing GSCM practices because all those GSCM practices are quiet costly in implementation." Green campaigning " is the best way to share the knowledge about GREEN PRODUCTS within public. Thus through knowledge transfer company can get profit from GSCM practices and gift a green environment for our future generation.

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