CHAPTER – 6

CONCLUSION
Conclusion

This study was conducted to measure the implementation and efficacy of GSCM practices in Indian Automobile Sector and relationship amongst GSCM Drivers, Efficacy of GSCM Practices and GSCM Performance.

6.1 Objective wise conclusions of the study are presented below:

1. To explore the GSCM practices adopted by Indian Automobile Sector.

This objective was achieved through extraction of fifty two parameters under seven dimensions of GSCM Practices from the literature available on GSCM and afterwards, pilot study questionnaire was framed to collect empirical data from automobile experts, to find out the implementation level of GSCM practices in Indian Automobile Sector. Out of fifty two parameters, two were removed for further study of efficacy due to their less mean score (Refer Table: 4.5.1).

The study revealed that, in general, Indian Automobile Sector is considering implementation of GSCM Practices into their supply chain. The Indian Automobile Sector has initiated implementation of Green Design (Mean = 4.05) and Green Manufacturing (Mean = 4) practices in their supply chain management activities. On the other hand, Green Purchasing (Mean = 3.60), Green Packaging (Mean = 3.91), Green Warehousing & Building (Mean = 3.81), Green Distribution & Transportation (Mean = 3.68), and Green Reverse Logistics (Mean = 3.13) are at the initial level of consideration.

So, it has been concluded that Indian Automobile Sector is at the initial stage of implementing GSCM Practices in majority of supply chain functions.
2. To explore and rank various Drivers of GSCM practices on the basis of their importance to the organization.

For achieving this objective total twenty two GSCM Drivers parameters were explored under five dimensions, from the available literature in the context of India and foreign both. The findings revealed that, there are multiple numbers of GSCM Drivers for Indian Automobile Sector for implementation of GSCM Practices (Refer Table 5.2.1).

Social Responsibility Drivers (ranked first) of GSCM is found to be the most important Driver in Indian Automobile Sector. In addition, The Indian Automobile Sector is also drives with Regulatory Drivers (ranked second) which is followed by Internal Drivers (ranked third) and Suppliers Drivers (ranked fourth). Hence, it can be concluded that, Indian Automobile Sector is responsive towards the responsibility to minimize negative effects on the environment and believed that, manufacturing units can prevent environmental problems by formulating environmental concern practices.

Additionally, internal environmental mission, international policies and cost of disposal and waste treatment are also found important in Indian Automobile Sector. Moreover, national and international regulations imposed by government, environmental partnership with suppliers, and suppliers’ investments on environmental concerned manufacturing also drive Indian Automobile Sector towards GSCM implementation. The competitors’ drivers are found to be the least important driver of GSCM implementation in Indian Automobile Sector.
3. To measure the efficacy level of GSCM Practices adopted in Indian Automobile Sector.

For measuring the efficacy level of GSCM Practices, mean was calculated for seven dimensions and fifty parameters of efficacy. The study reveals that, the efficacy level of seven dimensions of GSCM Practices is in between moderate to very high stage, which are; Green Design, Green Procurement, Green Manufacturing, Green Packaging, Green Warehousing & Building, Green Distribution & Transportation and Green Reverse Logistics (Refer Table 5.3.1 – 5.3.7)

Moreover, the highest Efficacy level is found of Green Manufacturing (Refer Table 5.3.1- 5.3.7) in Indian Automobile Sector, which is followed by Green Warehousing & Building, and Green Packaging. In addition, Green Design and Green Distribution & Transportation Efficacy of GSCM Practices found similar from high to very high level. Whereas, the Green Reverse Logistics Efficacy ranges from moderate to high.

Thus, It can be concluded that, out of seven GSCM practices, the efficacy of six practices are in between of high- very high level and only one practice i.e., Green Reverse Logistics, is in between from moderate – high efficacy level.

4. To find out the relationship amongst GSCM Drivers, Efficacy of GSCM Practices and GSCM Performance.

Correlation analysis in GSCM Drivers, Efficacy of GSCM and GSCM Performance is found significant (Refer Table 5.4.1). All variables are correlated in the expected direction. Thus, it can be concluded that the GSCM Drivers, Efficacy of GSCM Practices and GSCM Performance are positively and significantly correlated with each other in the Indian Automobile Sector.
5. To empirically investigate the functional relationship of various measures of Efficacy of GSCM Practices with GSCM Drivers.

Drivers motivate organizations to improve their efficacy. This research revealed following findings of relationship between drivers and efficacy of GSCM practices research findings in the context of Indian Automobile Sector (Refer Table 5.5.2 – 5.5.2.7).

This study reveals that overall GSCM drivers improve efficacy of GSCM practices in Indian Automobile Sector. Additionally, Regulatory drivers found significant influence on efficacy of green design and green transportation & distribution practices. Whereas, suppliers are found to be most influencing factor towards efficacy of; green design, green procurement, green manufacturing, green warehousing & building and green distribution & transportation practices in the supply chain of Indian Automobile Organizations.

In addition, it is found that, competitors’ drivers influence efficacy of downstream green supply chain practices, which are; green warehousing & building, green distribution & transportation and green reverse logistics practices. Whereas, internal drivers are found to motivate Indian Automobile organizations in green manufacturing, green warehousing & building, green distribution & transportation and green reverse logistics, respectively.

The study reveals that, social responsibility drivers significantly influence efficacy of green procurement, green manufacturing, green packaging, green warehousing & building and green distribution and transportation of Indian Automobile Organizations. Finally, the relationship among the efficacy of GSCM practices and GSCM drivers dimensions seem to make a logical sense. Thus, it can be concluded that, Indian Automobile Sector has important drivers which influence their efficacy of GSCM practices.
6. To empirically investigate the functional relationship of various GSCM Performance measures with Efficacy of GSCM Practices.

Efficacy of GSCM practice may help organization to improve the overall performance. Therefore, this study attempts to find out the relationship between efficacy of GSCM practices and GSCM performance (Refer Table 5.5.3 – 5.5.3.5).

The study reveals that overall efficacy of GSCM practices improve performance of Indian Automobile Sector. Whereas, efficacy of green design practices does not affect the performance. In addition, efficacy of environmental conscious green manufacturing enhances environmental performance of Indian Automobile Sector.

Additionally, efficacy of green packaging is not found significant to improve organization GSCM performance. On the other hand, efficacy of green warehousing & building significantly improve environmental, economic (positive) and economic (negative) performance as well. Efficacy of green distribution & transportation is found significantly influence environmental, economic (positive), economic (negative), operational and competitive, all the performance aspects of Indian Automobile Organizations. Whereas, efficacy of green reverse logistics only improve environmental performance.

Finally, it can be concluded that, efficacy of GSCM practices significantly influence overall performance of Indian Automobile Sector.
7. To propose the GSCM efficacy (GSCME) Model.

6.2 GSCM Efficacy (GSCME) Model

From the thorough study of literature review it is found that there are several GSCM models to measure the relationship in drivers, practices implementation and performance. In the current competitive environment automobile organizations need a tool which could help them to measure the efficacy of GSCM practices. The study has contributed GSCM efficacy model for Indian Automobile Sector. This model will help them to identify the drivers which are important for them to increase their efficacy in GSCM practices, scope to improve in efficacy of GSCM practice in their organizations and the efficacy performance outcomes.

The model measure has taken from previous studies which include; GSCM driver, efficacy of GSCM practices and GSCM performance. GSCM drivers include; Regulatory, Suppliers, Competitors, Internal and Social Responsibility. Efficacy of GSCM practices include; Green Design, Green Procurement, Green Manufacturing, Green Packaging, Green Warehousing & Building, Green Distribution & Transportation and Green Reverse Logistics. GSCM performance include; Environmental Performance, Positive Economic Performance, Negative Economic Performance, Operational Performance and Competitive Performance.
Figure 6.1: GSCM Efficacy (GSCME) Model
8. To suggest implications of study to Indian Automobile Sector.

6.3 Suggestions

The results show that Indian Automobile Sector is considering implementation of GSCM practices in their supply chain activities. Moreover, efficacy level of GSCM practices is found from moderate to high level. There are various drivers in Indian Automobile Sector to increase the efficacy level of GSCM Practices implementation. In addition, efficacy of GSCM practices has a strong relation with various performance measures in the Indian Automobile Sector.

Besides these all, few changes in the practicing SCM can build more effective green supply chain for Indian Automobile Sector. Suggestions are as follows:

- **GSCM Practices Implementation:** The Indian Automobile Sector may increase the implementation of green procurement practices like ISO14001 certification and environment audit of suppliers to improve the upward supply chain. Additionally, customer cooperation should be increase to make green design of products. Measurement of carbon foot prints during manufacturing should also be increased to improve the environmental and operational performance. It is also suggested that recycling and reuse of used vehicles or components should be also increased to minimize wastage in the environment.

- **Efficacy of GSCM Practices:** The Indian Automobile Sector efficacy level should be improved in green reverse logistics and green procurement. Automobile Organizations should take initiatives to collect back used products from customers and send to suppliers for recycle, remanufacture or reuse as a raw material.
Automobile Organizations should also improve the efficacy of upward supply chain i.e., Suppliers. To improve the efficacy of green procurement, organizations need to increase cooperation with suppliers on environmental purchasing. Automobile original equipment manufacturers may impose mandatory environment certifications (ex. ISO 14001) on the suppliers to improve the efficacy of green procurement.

6.4 Limitations and Scope for Future Work

- This study was conducted in the Automobile Sector of India. Therefore, the findings may not be applicable directly to other Industries and other countries as well.
- This study was conducted in India. Similar studies may also be conducted in other developing countries.
- This research was considered full supply chain practices from design of vehicle or component to recycling stage. Thus, future research may be also including only one aspect of supply chain for efficacy measurement.
- The data has been collected through structured questionnaire by social website Linkedin and by visiting local plants at nearby city. While responding on social site may influence the sincerity of responses. Therefore, case studies or interviews methods should be used in future study.
- The future study may also be used for other methodology to structure a comprehensive model of efficacy factors.
6.5 Implications of the Study

In the last two decades, environmental issues have become one of major issues of researcher, business, government and society as well. Hence, the implications of findings of this research may help all the stakeholders to be more attentive towards environment and benefits.

The implications of the present study are presented under two headings; theoretical implications and managerial implications.

a. Theoretical implications

- This study has added a new concept “efficacy” in the field of GSCM concepts.
- This study has provided integrated model of GSCM driver, efficacy of practices and performance.
- Limitations of this study may provide base for future research in the field of GSCM or the same.
- This study has provided extended knowledge in the domain of GSCM in developing country i.e., India.
- The present study has taken each aspect of GSCM stages in theory and modelling both.

b. Managerial Implications

- The present study has provided useful insights of environmental issues in automobile supply chain to Indian Automobile Sector.
- This study is helpful to automobile organizations to know the various aspects of GSCM efficacy and its impact on performance.