CHAPTER – 3

RESEARCH METHODOLOGY
Research Methodology

3.1 Introduction

This chapter aims to explain the appropriate methodology for achieving the research objectives. It starts with formulation of research hypotheses to find out the relationship in various dimensions of GSCM Drivers, Efficacy of GSCM Practices and GSCM Performance. Subsequently, it explains type of the study, sample size and tools for data collection followed by tools for data analysis applied in this study.

3.2 Hypotheses of the Study

The research aimed to investigate functional relationship in GSCM Drivers, Efficacy of GSCM Practices and GSCM Performance. Following hypotheses were formulated on all dimensions of GSCM:

GSCM Drivers and Efficacy of Green Design

- H0 EGSCM: There is no significant relationship between GSCM Drivers and Efficacy of GSCM Practices.
- H0 GD1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Design.
- H0 GD2: There is no significant relationship between Suppliers' Drivers and Efficacy of Green Design.
- H0 GD3: There is no significant relationship between Competitors' Drivers and Efficacy of Green Design.
- H0 GD4: There is no significant relationship between Internal Drivers and Efficacy of Green Design.
- H0 GD5: There is no significant relationship between Social Responsibility Drivers and Efficacy of Green Design.
- H0 GP1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Procurement.
- H0 GP2: There is no significant relationship between Suppliers' Drivers and Efficacy of Green Procurement.
- H0 GP3: There is no significant relationship between Competitors' Drivers and Efficacy of Green Procurement.
- H0 GP4: There is no significant relationship between Internal Drivers and Efficacy of Green Procurement.
- H0 GP5: There is no significant relationship between Social Responsibility Drivers and Green Procurement.
- H0 GM1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Manufacturing.
- H0 GM2: There is no significant relationship between Suppliers' Drivers and Efficacy of Green Manufacturing.
- H0 GM3: There is no significant relationship between Competitors' Drivers and Efficacy of Green Manufacturing.
- H0 GM4: There is no significant relationship between Internal Drivers and Efficacy of Green Manufacturing.
- H0 GM5: There is no significant relationship between Social Responsibility Drivers and Efficacy of Green Manufacturing.
- H0 GPK1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Packaging.
- H0 GPK2: There is no significant relationship between Suppliers’ Drivers and Efficacy of Green Packaging.
- H0 GPK3: There is no significant relationship between Competitors' Drivers and Efficacy of Green Packaging.
- H0 GPK4: There is no significant relationship between Internal Drivers and Efficacy of Green Packaging.
- H0 GPK5: There is no significant relationship between Social Responsibility Drivers and Efficacy of Green Packaging.
- H0 GWB1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Warehousing & Building.
- H0 GWB2: There is no significant relationship between Suppliers’ Drivers and Efficacy of Green Warehousing & Building.
- H0 GWB3: There is no significant relationship between Competitors’ Drivers and Efficacy of Green Warehousing & Building.
- H0 GWB4: There is no significant relationship between Internal Drivers and Efficacy of Green Warehousing & Building.
- H0 GWB5: There is no significant relationship between Social Responsibility Drivers and Efficacy of Green Warehousing & Building.
- H0 GDT1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Distribution & Transportation.
- H0 GDT2: There is no significant relationship between Suppliers’ Drivers and Efficacy of Green Distribution & Transportation.
- H0 GDT3: There is no significant relationship between Competitors’ Drivers and Efficacy of Green Distribution & Transportation.
- H0 GDT4: There is no significant relationship between Internal Drivers and Efficacy of Green Distribution & Transportation.
- H0 GDT5: There is no significant relationship between Social Responsibility Drivers and Efficacy of Green Distribution & Transportation.
- H0 GRL1: There is no significant relationship between Regulatory Drivers and Efficacy of Green Reverse Logistics.
- H0 GRL2: There is no significant relationship between Suppliers’ Drivers and Efficacy of Green Reverse Logistics.
- H0 GRL3: There is no significant relationship between Competitors’ Drivers and Efficacy of Green Reverse Logistics.
- H0 GRL4: There is no significant relationship between Internal Drivers and Efficacy of Green Reverse Logistics.
- H0 GRL5: There is no significant relationship between Social Responsibility Drivers and Efficacy of Green Reverse Logistics.
Efficacy of GSCM Practices and GSCM Performance

- H0 GSCMP: There is no significant relationship between Efficacy of GSCM Practices and GSCM Performance.
- H0 EP1: There is no significant relationship between Green Design and Environmental Performance.
- H0 EP2: There is no significant relationship between Green Procurement and Environmental Performance.
- H0 EP3: There is no significant relationship between Green Manufacturing and Environmental Performance.
- H0 EP4: There is no significant relationship between Green Packaging and Environmental Performance.
- H0 EP5: There is no significant relationship between Green Warehousing & Building and Environmental Performance.
- H0 EP6: There is no significant relationship between Green Distribution & Transportation and Environmental Performance.
- H0 EP7: There is no significant relationship between Green Reverse Logistics and Environmental Performance.
- H0 ECP1: There is no significant relationship between Green Design and Economic (Positive) Performance.
- H0 ECP2: There is no significant relationship between Green Procurement and Economic (Positive) Performance.
- H0 ECP3: There is no significant relationship between Green Manufacturing and Economic (Positive) Performance.
- H0 ECP4: There is no significant relationship between Green Packaging and Economic (Positive) Performance.
- H0 ECP5: There is no significant relationship between Green Warehousing & Building and Economic (Positive) Performance.
- H0 ECP6: There is no significant relationship between Green Distribution & Transportation and Economic (Positive) Performance.
- H0 ECP7: There is no significant relationship between Green Reverse Logistics and Economic (Positive) Performance.
- H0 ECN1: There is no significant relationship between Green Design and Economic (Negative) Performance.
- H0 ECN2: There is no significant relationship between Green Procurement and Economic (Negative) Performance.
- H0 ECN3: There is no significant relationship between Green Manufacturing and Economic (Negative) Performance.
- H0 ECN4: There is no significant relationship between Green Packaging and Economic (Negative) Performance.
- H0 ECN5: There is no significant relationship between Green Warehousing & Building and Economic (Negative) Performance.
- H0 ECN6: There is no significant relationship between Green Distribution & Transportation and Economic (Negative) Performance.
- H0 ECN7: There is no significant relationship between Green Reverse Logistics and Economic (Negative) Performance.
- H0 OP1: There is no significant relationship between Green Design and Operational Performance.
- H0 OP2: There is no significant relationship between Green Procurement and Operational Performance.
- H0 OP3: There is no significant relationship between Green Manufacturing and Operational Performance.
- H0 OP4: There is no significant relationship between Green Packaging and Operational Performance.
- H0 OP5: There is no significant relationship between Green Warehousing & Building and Operational Performance.
- H0 OP6: There is no significant relationship between Green Distribution & Transportation and Operational Performance.
- H0 OP7: There is no significant relationship between Green Reverse Logistics and Operational Performance.
- H0 CP1: There is no significant relationship between Green Design and Competitive Performance.
- H0 CP2: There is no significant relationship between Green Procurement and Competitive Performance.
H0 CP3: There is no significant relationship between Green Manufacturing and Competitive Performance.

H0 CP4: There is no significant relationship between Green Packaging and Competitive Performance.

H0 CP5: There is no significant relationship between Green Warehousing & Building and Competitive Performance.

H0 CP6: There is no significant relationship between Green Distribution & Transportation and Competitive Performance.

H0 CP7: There is no significant relationship between Green Reverse Logistics and Competitive Performance.

3.3 Type of the Study

This study is an exploratory, descriptive and causal as well. The exploratory research has employed to obtain background information about the area of research (i.e., GSCM) and to formulate hypothesis throughout study of literature. In the next stage, descriptive research design is used to in order to describe the characteristic of respondents and objective one and two. In the last stage, causal research is used to explain the relationship between the dimensions of GSCM Driver, Efficacy of GSCM Practices and GSCM Performance in the context of Indian Automobile Sector.

3.4 Universe and Sample Size

The study was conducted in Automobile Sector of India. The sampling has been done in the study of the organizational managers who were employed at the various Automobile Organizations in the supply chain/production/quality/design/sourcing departments those who were connected through social site of LinkedIn and plants at nearby of city (Indore).
The list of automobile organizations has been accessed online from Society of Indian Automobile Manufacturers (SIAM) and Automotive Component Manufacturers Associations (ACMA) website. On the basis of automobile product segments, 50 organizations were selected. Afterwards, emails have been sent to managers of Original Equipment Manufacturing (OEMs) and Auto Component Manufacturing Organizations through social site LinkedIn. Besides, automobile manufacturing plants at nearby city were also visited. Finally, Total 238 responses were received from the 12 states of India.

### 3.5 Tools for Data Collection

The data for study was gathered from both, primary and secondary sources. The secondary data was collected from various previous published research papers from Google Scholar, Emerald, Science Direct and ProQuest. Besides, primary data was also collected through structured survey questionnaire. The questionnaire was developed through content validity as presented in the chapter four questionnaire development of the study. Afterwards, data was collected through face to face interaction with respondents by visiting automobile manufacturing plant at nearby city and email was sent to the participants of various states through social site LinkedIn.

### 3.6 Tools for Data Analysis

In this research, SPSS (v21) has been used for data analysis and following tools has applied:

i. Cronbach Alpha has been computed to measure reliability by this formula

\[
\alpha = \frac{K}{K - 1} \left(1 - \frac{\sum_{i=1}^{K} \sigma_{Y_i}^2}{\sigma_X^2}\right)
\]

Where, \( K \) = items, \( \sigma_X^2 \) is the variance of the observed total test scores, and \( \sigma_{Y_i}^2 \) the variance of component \( i \) for the current sample of persons.
ii. Mean was computed to measure the implementation of GSCM Practices and the Efficacy of GSCM Practices of Indian Automobile Sector.

iii. Pearson Correlation Method was used to see the relationship in GSCM Drivers, Efficacy of GSCM Practices and GSCM Performance.

iv. Multiple Regression analysis was used to find out the functional relationship in GSCM Drivers, Efficacy of GSCM Practices and Performance.

The below Multiple Regression equation was used:

\[ Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e \]

Whereby, Y = Dependent variable, X1.... X4 = Independent variable, \( \alpha \) = Constant Coefficient, \( \beta_1.... \beta_4 \) = Regression Coefficient for X1.... X4, e = error

3.7 Conclusion

In this chapter, research methodology of the study has presented. This includes hypothesis development, type of the study, sampling technique, tools for data collection and analysis. The next chapter includes questionnaire development through content validity and pilot study results and findings.