Title : "A study on evaluation of logistic driver's impact on agriculture supply chain performance of farmers w.r.t. vegetables at Mysuru region"

1. Name of the College: Vidyavardhaka College of Engineering

2. Project Title: A study on evaluation of logistic drivers' impact on agriculture supply chain performance of farmers w.r.t. vegetables at Mysuru region

3. Branch: Department of Business Administration

5. Name(s) of project guide(s):

1. Name: Dr. Somashekhar I C

Email id: somashekharic@vvce.ac.in

Contact No.: 9141306148

2. Name: Dr. PSV Balaji Rao

Email id: mbahod@vvce.ac.in

Contact No.: 9480142081

6. Name of Team Members :

a) Name: Jatin Kumar D

USN No.: 4VV21BA041

Email id: jatinsamdariya@gmail.com

Mobile No: 9035473489

b) Hrithik Gowda K N

USN No.: 4vv21ba039

Email id: hrithikmanjula4599@gmail.com

Mobile No.: 7411517317

c) Rajesh Rathod

USN No.: 4VV21BA076

Email id: rrathod740666@gmail.com

Mobile No.: 7353796469

d) Name: Suhas DC

USN No.: 4VV21BA100

Email id: suhasdc17@gmail.com

Mobile No.: 9845879180

❖ Scope / Objectives of the project:

Objectives:

1. To study the role of logistic drivers (facilities, transportation, inventory) in agriculture supply chain management of vegetables.

2. To study the role of agriculture supply chain performance of farmers w.r.t. vegetables.

3. To study the relationship between logistic drivers and agriculture supply chain performance of farmers w.r.t. vegetables

4. To develop and test the model in evaluating the impact of logistic drivers on the agriculture supply chain performance of farmers w.r.t. vegetables

Hypothesis:

H1: There is a positive relationship between logistic driver (Facilities)(IDV) and agriculture supply chain performance of farmers w.r.t. vegetables (DV).

H2: There is a positive relationship between logistic driver (Transportation) (IDV) and agriculture supply chain performance of farmers w.r.t. vegetables (DV)

H3: There is a positive relationship between logistic driver (Inventory) (IDV)and agriculture supply chain performance of farmers w.r.t. vegetables (DV) .

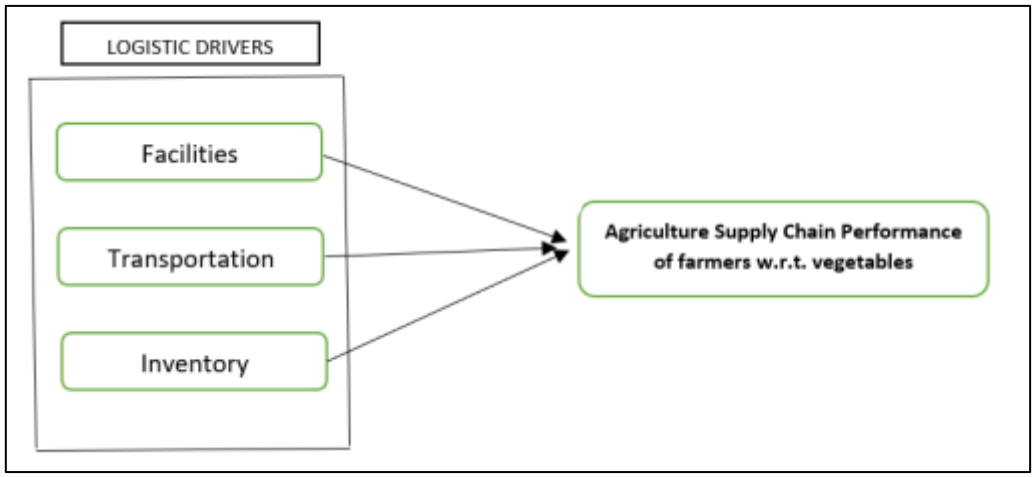
H4: There is an impact of logistic drivers (Facilities, Transportation, Inventory) (IDV)on agriculture supply chain performance of farmers w.r.t. vegetables (DV).

❖ **Keywords :**

The following are the keyword used in the following study.

- Facilities
- Transportation
- Inventory
- Supply chain performance by farmers

❖ **Conceptual Framework**



A recent estimate by the Ministry of Food and Civil Supplies, Government of India, puts the total preventable post-harvest losses of food grains at 10 per cent of the total production or about 20 million Mt, which is equivalent to the total food grains produced in Australia annually. In a country where 20 per cent of the population is undernourished, post-harvest losses of 20 million Mt annually is a substantial avoidable waste. According to a World Bank study (1999), post-harvest losses of food grains in India are 7-10 per cent of the total production from farm to market level and 4-5 per cent at market and distribution levels. These losses would be enough to feed about 70 -100 million people, i.e. about 1/3rd of India's poor or the entire population of the states of the Bihar and Haryana together for about one year. Thus, it is evident that the post-harvest losses have impact at both the micro and macro levels of the economy due to lack of sustainable supply chain management of food grains and vegetables. These poor performance is due to inefficient practices during transportation of grains and vegetables from farm to APMC market and industr y. Supply chain performance purely depends on the contribution of logistics

drivers like facilities, inventory and pricing, which manipulates the decision making of farmer and also indirectly affected by the support from Government initiatives. The study is proposed to analyze the relationship and impact of logistic drivers on agriculture supply chain performance of farmers w.r.t. vegetables. Supply chain performance is "the degree to which a supply chain meets end-user and stakeholder requirements concerning the relevant performance indicators at any point in time" (Christien et al. 2006). Miller (2008) highlighted that efficiency and environmental friendliness walk together towards improvement. There are many factors that would have a direct impact on sustainable supply chain management. Supply chain performance of an agriculture commodities depends on its strategies in balancing the responsiveness and efficiency of logistical drivers of supply chain (facilities, inventory, transportation). The logistic drivers are playing key role in influencing the agriculture supply chain performance. Among them, Facilities in a supply chain refer to the physical location of the nodal organization or its partners in the supply chain; the locations where a vegetables/product or service is being produced, processed or stored. Transportation plays a key role in the SCM of a nodal organization, as the movement of vegetables/goods across supply chains to ultimate customers as an important value creating activity. From the available array of transportation options, the nodal organization opts for a specific choice at every stage based on cost efficiency and responsiveness as the supply chain focus. Inventory could include storage of vegetables at farm field, at warehouse, at APMC(Agriculture Produce Marketing Committee)s / weekly haats cold storages. Inventory management of vegetables becomes crucial and is related to farmers/firm's strategic intent and the competitive situation in which it operates. Inventory plays a significant role not only in the supply chain but also in competitive strategies. Bachetti, Plebani, Saccani and Syntetos (2010) argue that inventory management need to be organized in a logical way to facilitate the organization knowledge of when to order and quantity to order. The overall supply chain performance is depending on contribution of efforts by each channel member in individual stage of supply chain in enhancing the efficiency of decision making. In the current study channel member i.e. farmer, who grows the vegetables in their farm and sell the fresh produce either near the farm or bring to the Agriculture Produce Marketing Committee (APMC) for better revenue returns. The decisions made by the farmer towards supply chain are leading to overall supply chain

performance which leads to sustainable supply chain management and contributes towards economic growth of the country. The major challenge is assessment of inconsistent performance of logistic drivers. These variations may deviate the objective of supply chain performance. The supply chain decisions influenced by various factors (logistic drivers) which are considered in the model to analyze their relationship and impact on agriculture supply chain performance of farmers w.r.t. vegetables. Hence the initial two objectives are focusing on understanding the role of logistic drivers(facility, inventory, transportation), and agriculture supply chain performance. Third objective is to study the degree of relationship between logistic drivers and supply chain performance, conforming to the type (positive or negative) and level of degree of relationship which helps to make an analysis of behavior of each variable under study. Fourth objective is to study the impact of each logistic driver (facility, transportation, inventory) on overall supply chain performance by farmers. This objective analysis helps to evaluate the contribution and impact of each driver towards supply chain performance and also among the drivers which driver is playing key role in enhancing the supply chain performance of farmers w.r.t. vegetables.

❖ Statement of the Problem

This section focuses on the problem statement. Along with the problem's importance, several theoretical and practical issues have been addressed. Sustainable supply chain management depends on optimizing the lost incurred during movement of fresh produce throughout the supply chain. The degree of optimization depends on the impact of logistic drivers. Farmers after growing the vegetables sell them either near the farm or in APMC to get better revenues, which depends on the decision taken by farmers among alternate mode of operations with respect to facility utilization, inventory management, and transportation channel. An analysis of the relationship helps to identify the contribution of each driver (facility, transportation, inventory) and their degree of contribution in enhancing the overall supply chain performance, which is supporting economic growth of the country. Aftermath covid19, the environmental scenario has changed the conditions of operations of supply chain activities, which forced the farmers to rethink on their decision towards these. In light of the preceding issue, the study's wide title could be as follows:

“A study on evaluation of logistic drivers’ impact on agriculture supply chain performance of farmers w.r.t. vegetables at Mysuru region “

METHODOLOGY

- **Research design**: Descriptive research design carried out to understand the nature of the data and type of response.
- **Sampling frame & sampling technique**

Mysuru district is situated in the southern part of the Deccan Peninsula and it forms the southern most district of Karnataka State in the Indian Union. Mysuru city is the headquarters and spread across 7 taluks, namely Mysuru, Tirumakudalu Narasipura, Nanjangud, Heggada Devana Kote, Hunsur, Piriyapatna and Krishna Raja Nagara. Mysuru is covering with 4 Hoblis and 155 villages. Farmers who grows vegetables in these villages and bringing them to Mysuru APMC for selling are considered as sampling unit and living in these villages are taken as sampling frame.

- **Sampling technique**

  Stratified and convenience sampling technique adopted for the study. Stratified sampling decides the respondent should be farmer and who grows and arriving to APMC to sell the vegetables. Also continuing the selection, convenience sampling used in selecting and collecting the information from respondents who are available conveniently.

- **Sample size**

  In Mysuru region, total 320,887 Cultivators are depended on agriculture farming out of 250,832 are cultivated by men and 70,055 are women. Sample size determines the appropriate representation of the population by sample in the study. This study employed a sample size of 160 farmers. For the sample size, with 95% confidence level and 0.05 level of significance which gives good reliability for the items prepared for data collection.

❖ **Data collection method :**

Secondary data : APMC magazine, Krishi Maarata vahini website and other agricultural magazine referred.

Primary data: Survey method is adopted with personal interview for collecting the information from farmers using schedule method with structured questionnaire.

Statistical tools used for analysis of data : Reliability test, Correlation, Regression.

Statistical software: SPSS software

RESULTS AND CONCLUSION

Findings and Discussion of results:

Supply chain performance is the key decision criteria, executed by farmers for selling the vegetables in Mysuru market. Since supply chain overall performance is depends on the contribution of logistic drivers, the study is conducted to analyze the challenges faced by the farmers in terms of the facility availability, inventory decisions, and transportation decisions.

The study was conducted with the help of structured questionnaire to interact with the farmers arriving from 4 to 5 talukas and more than 20 villages who are bringing the sell their vegetable produce.

The market period is between early morning 4.00 am to 9.00 am approximately. The market will be open for 24 hours. During survey 160 farmers were interacted who are representing different villages in the study.

The survey results are as follows:

- All the respondents are male farmers only.
- Among the farmers study representing 36 to 45 age group is high.
- Among the farmers most of them are with SSLC whereas many of them with schooling.
- Most of the respondents representing below two lakh income.
- Most of the respondents are married.

Correlation results :

- Supply chain performance is showing significance value less than 0.05 ensuring that there is an existence of relationship between supply chain performance and inventory, supply chain performance and Transportation, supply chain performance and Facility with respect to Hypothesis 1, 2 and 3

- Also supply chain performance is showing 36.4% of positive correlation with Inventory, 16.2% of positive correlation with Transportation, 26.4 % of positive correlation with Facility driver showing the existence of overall positive relationships.

Regression analysis results:

- The model summary showing the degree of impact of independent variables on dependent variable. In the present study the supply chain performance has influence of 37.3% from the independent variables i.e. Inventory, facility and transportation.
- ANOVA table is used to analyse the hypothesis of significant impact. Since in the model it has been observed that significant value is less than 0.05, is proving the impact of logistic drivers on supply chain performance of farmers with respect to vegetables.
- It is found that Inventory is having significant influence on supply chain performance where as Transportation and facility are not significant that means not influence on supply chain performance. This the result supporting the answers of farmers collected during personal interview.

CONCLUSION

The supply chain performance study was initiated to understand the logistic drivers i.e. inventory, facilities in terms of warehouse, commission agents facility, Government support in creating facility to offer best trade practice at APMC, communication from APMC to farmers, grievance handling by APMC to support farmers, transportation challenges and strategies practice by farmers while bringing and selling the vegetables in the Mysuru APMC yard. Any supply chain success depends on identifying which driver is responsible for enhancing the performance or which driver is responsible for curtailing the performance. Since study is conducted only to the farmers visiting Mysuru vegetable APMC, analyze the consideration by farmers and contribution of each driver in decision making ability of farmers. The study revealed based on the correlation and regression analysis ensuring the existence of relationships among them but while impact study showing that only driver inventory playing key role in enhancing the overall vegetable supply chain performance decision by farmers. That means farmers when bring the vegetables they are selling by compromising with price quoted

during auction either by APMC or at commission agents in their allotted premises. Since Mysore is a market place falling at the state border near to the other states (Tamilnadu, and kerala), where 80% of the vegetables are purchased by Kerala traders through commission agents in APMC whereas, around 20% only consumed by local market. Hence it is a very potential market for in and around villages farmers who grows vegetables. The farmers are having good transportation facilities and third party service providers availability has reduced the challenges of transportation for their vegetables movement. Also, as due to huge demand for vegetables, there is no scope of storage of vegetables in the cold storage. The cold storage near Nanjangud is helping the commission agents and few big farmers in rethinking of future market opportunities. The facilities offered and maintenance by APMC has created well hygiene environment supporting for daily trade practices. The government may initiate with cold storage at Mysuru APMC may brought change in the trade perception of farmers.

INNOVATION IN THE PROJECT

The study was initiated to understand the supply chain challenges faced by the farmers while bringing and selling the vegetables in Mysuru APMC. The overall supply chain performance always contributes to optimization of cost and benefits towards country economic condition and agricultural policies for farmers. The logistic drivers always acts as bottlenecks in the supply chain, especially in agriculture supply chain management where vegetables are highly perishable and around 2 to 5% of wastage incurring lost to the economy. The lost can be optimized by analyzing the insights of drivers relationship with supply chain performance of vegetables. The study revealed that present government infrastructure related to transportation and facilities farmers have less challenges whereas they are more concern with inventory management including cold storage facilities.

Further scope of study:

1. Since the study is conducted for logistic drivers only, it can be conducted for other drivers and their impact can be studies to enhance the overall supply chain performance of farmers which indirectly.

2. The study conducted for Mysuru APMC, whereas the same study results may vary to other APMC's which is depending on the facilities, geographical conditions and demographic status of the farmers.

3. The study may also conduct exclusively for analyzing the perception of farmers towards APMC policies and trade practices towards them.