ISSN PRINT 2319 1775 Online 2320 7876

*Research paper*  UGC CARE Listed ( Group -I) Journal Volume 11,S Iss 3, Dec 2022

# ISSUES AND CHALLENGES IN SUPPLY CHAIN MANAGEMENT FOR VEGETABLE MARKETING: A CASE STUDY OF BARGARGH DISTRICT IN ODISHA

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## ABSTRACT

The areas of supply chain management in vegetable marketing have received significant attention from many researchers. Many of the prior studies have focused on foreign countries in this context, while very few studies have been conducted on the content of the state of Odisha also the majority of the studies have focused on the whole horticulture sector but not specified any particular sector. However, the present study is an attempt to explore the issues and challenges in supply chain management for vegetable marketing regarding the awareness level of young people will be dealt with in this study. The study has been conducted by taking farmers, local commission agents, wholesalers, retailers & consumer responses from Bargarh District. India is the world's second-largest producer of many vegetables, whereas Odisha ranked fourth in terms of the production of vegetables. Supply chain management plays an important role for the vegetable growers and also for the consumers so that the farmers could be benefited and the consumers could fetch fresh vegetables at the proper price. Vegetable growers are faced many challenges due to limited irrigation facilities and insufficient infrastructure support like cold storage, markets, roads, transportation facilities, etc these are the main reason for low vegetable production. Vegetable crops are more damaged due to heavy post-harvest and handling losses, and high cost of production. For this analysis, the total sample size of farmers is 504, local commission agents 45, wholesalers 67, retailers 84, and the consumer 100 respondents have been selected from that region. This research mainly focuses on the block-level data of the Bargarh

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district of Odisha. It focuses on the new innovative ideas used for cultivation & marketing. It also focuses on the engagement of youth people and focused produce quality crops at a minimum price.

**KEYWORDS:** Supply Chain Management, Vegetable Marketing, Government Incentives, Technology

## INTRODUCTION

In the new age of supply chain management, vegetable marketing plays a vital role in moving the products from farmers to consumers and vegetable outputs are very necessary for the development of the rural area and their people. It involves synchronization of various activities such as assembling, grading, storage, transport, and selling of products. The word Vegetable-farming refers to increasing the production of vegetables through the cultivation of land and marketing refers to those activities which are involved in buying & selling goods and services. In recent years, vegetable farming has faced many challenges like sudden climate changes, floods, storm, etc. that destroy vegetable property that causes low productivity. Thus, vegetable marketing helps in the formulation of government policy or incentive schemes, which will help in growing food production and achieving food security. Here, Input marketing and product marketing is the two important dimensions in vegetable marketing, input marketing includes fertilizers, seeds, pesticides, electricity, pump set, farm machinery, diesel, etc. but product marketing includes the exchange of goods and its deals with traders, wholesalers, and retailers, etc.

In the state of Odisha, populations depend upon agricultural activities for their livelihood. There must be required a good market for the selling of those products through a different medium. For that, farmers have needs an adequate amount of finances and other facilities of the governments are necessary. However, Farmers are neglected in society; despite this, they continuously work in the field and cultivate crops, not for only their consumption but they help a country to be self-sufficient in food production.

In spite of several schemes and programs implemented by the Governments, the financial condition of farmers has not been improved accurately, even though 70 years have passed since Independence Day but today also many farmers are facing various challenges. The farmers of

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India do not get adequate opportunities to sell their products. Lack of proper storage and go down, the farmers sell their vegetable product at a cheap price to the wholesalers and the wholesalers sell it to the retailer with a vast margin. India is the second largest producer of vegetables in the world.

Most of the farmers are doing farming by taking loans from financial institutions. However, if they do not get the actual expected return then it is too difficult to carry on their livelihood. Some farmers in India do so suicide due to the heavy burden of loans taken by them. The Govt. of India should provide proper go-down facilities to store the vegetable produced and give loans to farmers with a simplified rate of interest, which can be paid easily by them.

## REVIEW OF LITERATURE

Supply Chain Performance Indicators that improve food security through effective information technology, brand management, and cool chain infrastructure (Mor, R.S. *et al.* 2018). The cold chain management will benefit the farmers and reduce the physical harm through the Use of refrigerated vehicles with minimum load for product transportation (Shashi, *et al.* 2017). The supply chain has been instrumental in bringing positive technological innovations to the forefront. Information technology has been able to two types of products, direct product innovation and indirect collaboration with the supply chain (Jimenez, D.J *et al* 2018). Consumer satisfaction is a priority in reducing supply chain losses along with supply chain management and increasing farmers 'revenue. Vegetables are often lost due to inconsistencies in market demand forecasts and supply chains (Shukla and Jharkharia, 2013). This study did not provide scopes for "accessing market information" and farmers' education levels are very low. Selling and distribution expenditures are incurred by both farmers and consumers. The authors concluded and suggested the above studies that farmers will get a fair price for selling their agricultural products and the main motive of this topic is to encourage farmers and gain more profit for this survival (Mishra, 2012). When youth engaged in agriculture, youth can reduce the poverty. The author collected the data from farmers & consumers, and the author concludes that youth can positively challenge to future agriculture system (Ajani, *et al*. (2015). Agricultural infrastructural facilities are more necessary for rural areas. It is helpful to farmers, as results increase agriculture productivity and developed marketing efficiency. The author was collecting

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the data from agricultural ministers, transport ministers, and agricultural marketing directors, the author conclude this topic infrastructural facilities provide more benefits to farmers and consumers (Mishra, 2015). The main focus of the study is to show the present framework and operation of agricultural activities in the rural and urban markets. To get the result the author collects the data from the appellate in questionnaire format. For the next analysis of the data, the author use the excel sheet. The author finally concludes that agricultural marketing activities and functions are affected by new rules, regulations, and policies. In this survey, it was analyzed that the private sector can follow these new rules and regulations (Acharya, 2016). They analyzed with the help of excel by calculating descriptive statistics. Finally, the study found that farmers have it impossible to properly utilize these facilities because large numbers of farmers are illiterate and they belong to rural areas. The communication facilities are very poor so they have not reached any awareness through the government (Mohanty, 2016). Now a day's traditional technology is being replaced by new technology, so this requires proper training and other necessary facilities so that the farmer can use the new technological equipment. The author has collected the primary data from big farmers and institution with the help of questionnaires and after analyzing, those data he found that by using modern technology agricultural production could be increased but adopting new technology are very expensive. It is a major challenge for the farmers for which governments and other institutions should give minimum financial support with subsidies so that farmers can easily achieve their goals (Nayak, 2016).

## OBJECTIVES OF THIS STUDY

- To analyze the perception of the farmers on the new and innovative ideas of young generations for improving the supply chain management in vegetable marketing.
- To identify the impact of vegetable sector growth through the Government incentives received by the farmers of Bargarh district.

## HYPOTHESES OF THE STUDY

- Based on objectives and different variables, the following null hypothesis was formulated and tested for significance

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- **$H_0$:** There is no significant vegetable growth through the Governments incentives received by the farmer.

## METHODOLOGY OF THE STUDY

- **Sampling Procedure-** A multi-stage convenient sampling was used for this study. The total sample size of farmers was 504, local commission agents 45, wholesalers 67, retailers 84, and the consumer 100 respondents have been selected from that region.
- **Research Type-**The type of research design followed for the study will be exploratory research design.
- **Data Collection-** This research is mainly based on quantitative patterns; hence the data were obtained using structured questionnaires. The data will be collected from farmers by doing field visits. Farmer's perceptions of accepting innovation at farms are very encouraging. The twelve blocks of the district were selected having the maximum acreage under the vegetable.

**Table1: Opinion of Respondents from Bargarh District**

| District | Block | Farmers respondents | Local traders respondents | Wholesalers | Retailers | Consumer |
|---|---|---|---|---|---|---|
| Bargarh | Ambabhona, | 40 | 3 | 5 | 8 | 11 |
| | Attabira, | 38 | 5 | 7 | 9 | 8 |
| | Bargarh, | 45 | 4 | 3 | 5 | 10 |
| | Barpali, | 42 | 2 | 5 | 10 | 8 |
| | Bhatli, | 39 | 4 | 7 | 11 | 6 |
| | Bheden, | 41 | 6 | 7 | 8 | 5 |
| | Bijepur, | 43 | 3 | 10 | 5 | 6 |
| | Gaisilet, | 37 | 4 | 5 | 3 | 18 |
| | Jharbandh, | 47 | 3 | 7 | 5 | 5 |
| | Padampur, | 50 | 1 | 2 | 3 | 11 |
| | Paikmal and | 46 | 7 | 3 | 8 | 3 |
| | Sohella. | 36 | 3 | 6 | 9 | 9 |

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| | | | | | |
|---|---|---|---|---|---|
| **Total** | 504 | 45 | 67 | 84 | 100 |

Source: Primary Data

- **Data Analysis Tools-** Percentage analysis and regression analysis has been performed to get the findings. With the help of Microsoft Excel & SPSS, all the data has been analyzed.

## RESULTS & DISCUSSION

**Table 2: Demographic Profile of Respondents (n=800)**

| Stratification variables | Category | Frequency | Percentage (%) |
|---|---|---|---|
| Age | 18-28 years | 310 | 39.0 |
| | 29-39 years | 289 | 36.0 |
| | 40-50 years | 155 | 19.0 |
| | Above 51 years | 46 | 6.0 |
| Educational Qualification | Under Matriculation | 345 | 43.0 |
| | Intermediate | 132 | 17.0 |
| | Graduation | 89 | 11.0 |
| | Others | 234 | 29.0 |
| Gender | Male | 600 | 75.0 |
| | Female | 200 | 25.0 |
| Occupation | Farmer | 504 | 63.0 |
| | Local commission agent | 45 | 6.0 |
| | Wholesaler | 67 | 8.0 |
| | Retailer | 84 | 10.0 |
| | Consumer | 100 | 13.0 |
| Size of Land under cultivation | Below 1 acre | 249 | 31.1 |
| | Between 1-2 acres | 300 | 37.5 |
| | Between 2-3 acres | 200 | 25.0 |
| | Above 3 acres | 51 | 6.4 |

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Source: Primary Data

Table: 2 shows the descriptive statistics about the Demographic profile of respondents. Here, showing the highest percentage of involvement in this study. The age of 18-28 years is 39%, under matriculation is 43%, the male is 75%, the farmer is 63%, and between 1-2 acres is 37.5% respectively.

**Descriptive analysis**

Each of the respondents was given a score based on his/her performance towards respondents in vegetable marketing. Five-point Likert Scale has been used here (5- strongly agree, 4- agree, 3- neutral, 2- disagree, 1- strongly disagree.

**Table 3: Descriptive Statistics (n=800)**

| Variable | Range | Mean | Std. Deviation | Variance | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Engaged to youth people | 4.00 | 4.2550 | .95321 | .909 | -1.441 | 1.873 |
| Cold storage | 4.00 | 4.2888 | .91729 | .841 | -1.627 | 2.896 |
| Online Marketing | 4.00 | 4.3050 | .94900 | .901 | -1.619 | 2.535 |
| Marketing information and services | 4.00 | 4.3850 | .93025 | .865 | -1.902 | 3.726 |
| Proper utilization of governments policy | 4.00 | 4.1113 | .85134 | .725 | -1.251 | 2.154 |

Source: SPSS Output

The above table: 3 shows the descriptive statistics about the investment in different heads. Mean standard deviations are calculated for this purpose. The mean for engaged youth people is 4.2550, cold storage is 4.2888, online marketing is 4.3050, marketing information and service is 4.3850, and proper utilization of Govt. policy is 4.1113 respectively.

**Multiple Regression Analysis**

- To identify the impact of vegetable growth through Government incentives.

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**Regression Equation:**

Y = a + b1X1 + b2X2 + b3X3 + b4X4 + b5X5 + …. e

Where Y = Vegetable Growth (Dependent variable)

b1, b2, b3, b4, b5 = Constants

a = Intercept of Y

X1 = Kalia Scheme (Independent variable)

X2 = Mukyamantri krushi udoyago yojana (Independent variable)

X3 = Soura jala nidhi yojana (Independent variable)

X4 = Pradhanmantri kisan nidhi yojana (Independent variable)

X5 = Pradhamanti fasal bima yojana (Independent variable)

e = Error term

**Hypotheses Testing:**

**$H_0$:** There is no significant vegetable growth through the Governments incentives.

**Sub-hypotheses:**

**$H_{01}$:** There is no significant impact of the Kalia Scheme on vegetable growth.

**$H_{02}$:** There is no significant impact of Mukyamantri krushi udoyago yojana on vegetable growth

**$H_{03}$:** There is no significant impact of Soura jala nidhi yojana on vegetable growth

**$H_{04}$:** There is no significant impact of Pradhanmantri kisan nidhi yojana on vegetable growth

**$H_{05}$:** There is no significant impact of Pradhamanti fasal bima yojana on vegetable growth

**Table 5: Output of Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|---|---|---|---|---|---|
| 1 | .771 | .595 | .592 | .56512 | 1.722 |

Source: SPSS output

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Table: 5 indicates the model summary of multiple regression analysis. The dependent variable "Vegetable Growth" was regressed on the predicting variables of Pradhanmantri fasal bima yojana, Kalia scheme, Mukhyamantri krushi udoyoga yoyana, Pradhanmantri kisan nidhi yojana, Soura jalanidhi yojana. In this study, the overall model value of $R^2$ =.595. Durbin-Watson value shows the assumption of independence of error term. Its value lies between 1-3 representing the independence of the error term. If the Durbin-Watson value lies below 2, it means a positive correlation. If the value lies exactly 2, it means the data is uncorrelated. If values lie greater than 2 means negatively correlated. In the present study, the Durbin-Watson value is 1.722, which means a positive correlation. It fulfills the assumption of independence of error term & there is no autocorrelation problem in the data set.

**Table 6: Output of ANOVA**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 371.927 | 5 | 74.385 | 232.920 | .000 |
| | Residual | 253.572 | 794 | .319 | | |
| | Total | 625.499 | 799 | | | |

Source: SPSS Output

Table: 6 indicates the results of ANOVA. The independent variables significantly forecast the performance of vegetable growth, F statistics in ANOVA is 232.920

**Table 7: Output of Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.287 | .138 | | 9.342 | .000 |
| | Kalia scheme | .757 | .022 | .773 | 33.909 | .000 |

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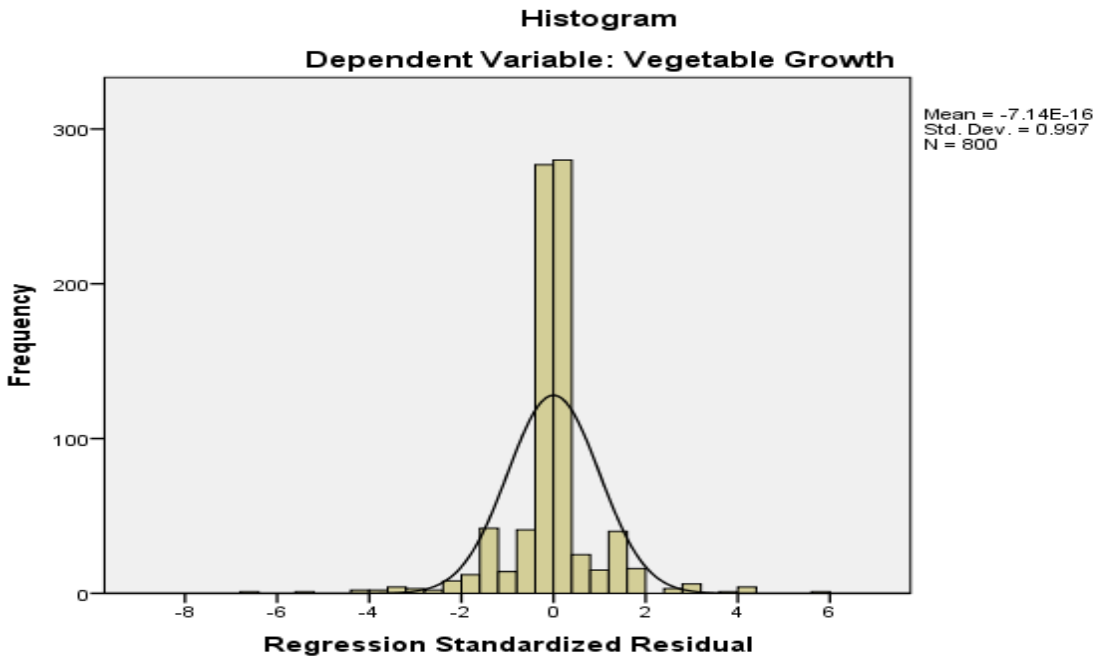
| | | | | | | |
|---|---|---|---|---|---|---|
| | Mukhyamantri krushi udoyoga yoyana | -.071 | .026 | -.078 | -2.734 | .006 |
| | Soura jalanidhi yojana | .023 | .029 | .026 | .791 | .001 |
| | Pradhanmantri kisan nidhi yojana | .026 | .029 | .029 | .894 | .031 |
| | Pradhanmantri fasal bima yojana | -.028 | .027 | -.030 | -1.048 | .005 |

Source: SPSS Output

Table: 7 indicates that the p-value (0.000) <.05, which indicates that five factors of the government incentives scheme under the study have a significant impact on vegetable growth. It means the null hypothesis was rejected & it found that Pradhanmantri fasal bima yojana, Kalia scheme, Mukhyamantri krushi udoyoga yoyana, Pradhanmantri kisan nidhi yojana, Soura jalanidhi yojana.

**Figure: 1**




Source: SPSS Output

From the above figure: 1 the Regression analysis, here correlation coefficient (R) is .771, R square is .595. The adjusted R square is .592. Here P value is .000, when the P value (.000) <

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.05* then the null hypothesis has been rejected & alternative hypothesis has been accepted. It means there is a relationship between Vegetable growth and Government incentives.

## CONCLUSION

The results of the present study show that most people's age and gender play an important role in vegetable marketing. Male farmers are more efficient than female farmers in vegetable marketing. Most of the farmers belonged to the middle class. Regarding education, the farmers were found to have attended under matriculation. The results of this study revealed vegetable marketing can be developed for the benefit of both farmers and end consumers and can play a major role in increasing farmers' income, creating employment opportunities for local people, and improving livelihoods. It can be noted from the study that vegetable marketing in the Bargarh district includes various stakeholders like farmers, commission agents, wholesalers, and retailers. Vegetable growers sell their produce immediately after harvest due to damage to produce, lack of cold storage, the poor financial condition of farmers, etc. The farmers of the Bargarh district will be aware of their performance in vegetable marketing through knowledge in providing credit facilities, training, technical skills, and understanding of government systems.

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