Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
March 2024 5(3), 1438–1446

AN ECONOMIC STUDY ON PRODUCTION AND CHANNELS DISTRIBUTION OF MULTIPLIER ONION IN TIRUNELVELI DISTRICT

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DOI
10.29121/shodhkosh.v5.i3.2024.4701

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

ABSTRACT

Onion is an important vegetable crop and it has gender economic importance among the vegetables since it is one of the leading commodities in agricultural exports. Hence, the economic performance of the crop is of critical importance in improving the efficient use of resources. The cost of production and the net returns obtained per unit would determine the profitability of the crop. The profitability of an enterprise depends upon the efficient use of the resources in production. Further the study of cost of returns structure of onion would help the farmers in ensuring proper resources combinations to augment the onion yield, thereby increasing the profit.

1) INTRODUCTION

India is rich in the horticultural heritage and genetic wealth. It is possible to grow vast varieties of fruits, vegetables and flowers in India because of the enormous diversity in the agro-ecological conditions prevailing in different parts of the country. The downstream employment potential of horticulture is very high. Onion has been one of the major horticultural crops grown in India for quite a long time, consumed by people in every part of the country.

The onion originated from the region comprising North-west Asia, Afghanisthan, Former Soviet Republic of Tazik and Uzbek Western Tienshan. Western Asia and the area around Mediterranean Seas are its secondary centres of origin. It was known in the earliest times as it is pictured an Egyptian monument and mentioned in the Bible. A legend relates that when Satan departed from Eden, the onion grew at the imprint of his right foot and garlic at the imprint of his life.

2) STATEMENT OF THE PROBLEM

Onion is an important vegetable crop and it has gender economic importance among the vegetables since it is one of the leading commodities in agricultural exports. Hence, the economic performance of the crop is of critical importance in improving the efficient use of resources. The cost of production and the net returns obtained per unit would determine the profitability of the crop. The profitability of an enterprise depends upon the efficient use of the resources in production. Further the study of cost of returns structure of onion would help the farmers in ensuring proper resources combinations to augment the onion yield, thereby increasing the profit.

Agricultural marketing is, therefore, of greater importance. Commercialization in agriculture has further increased the importance of marketing. Farmers raise the crops with a hope of receiving fair returns for their hard labour. For this, they depend upon the market conditions. But the existing marketing methods are not able to surmount the barriers of skepticism and tradition. The existing market forces seem to be too strong and entrenched to allow any change. This problem of marketing gets further added up by the special features of agricultural commodities namely, their inelastic demand, seasonality in supply, spatially scattered production, bulkiness and perish ability which requires care and demand personal attention in impersonal markets.

3) OBJECTIVES OF THE STUDY

The proposed objectives of the study are:

1) To estimate the cost and returns structure of onion cultivation for small and large farmers.
2) To examine the nature and extent of inequalities in net return distribution.
3) To identify the determinants of marketable surplus in onion.
4) To identify the problem faced by the onion cultivation in the production and marketing of onion.

4) REVIEW OF LITERATURE

4.1. STUDIES RELATING TO COST AND RETURNS

Harrison[1] studied the cost and return structure of small and large farms in his study on "Agricultural Modernisation and Income Distribution". The study was conducted in Tanjore District, Tamil Nadu. Primary data were collected for ADT 27 Cotton cultivation in the Kuruvai season (June-October) in the year 1967-68. His study revealed that small farmers spent higher amount per hectare on the input. Chemical fertilizer as the highest input cost was incurred by the small and large farmers, followed by the input, seed.

Nirmala[2] in her study on rice cultivation observed that female labourers were preferred for most of the farm activities. The small farmers incurred more expenses on labour employment compared to large farmers. The input-output ratio per acre in terms of operational cost to total cost was less for small farmers than for large farmers. The small farmers incurred higher cost of cultivation and obtained larger quantity of output per acre than the large farmers.

4.2. STUDIES RELATED TO YIELD GAP AND YIELD CONSTRAINTS

There are two common ways of defining the concept of yield gap; First, directly comparing the experiment station yield to the yield at farm; Second, comparing yield of the best farm with that of the average on the poorest farm. [3] Thus, yield gap may be classified into two kinds - Yield gap I and Yield gap II. The Yield Gap I represents the difference between the experiment station yield and potential farm yield. Yield Gap II corresponds to the potential farm yield and actual farm yield. The maximum yield obtainable from a variety under particular situation is called 'potential yield', while the average yield attained under farm condition is known as 'actual yield'.

Davidson and Martin[4] in their study, "The Relationship between Yields on Farm and in Experiments Station" stated that the relationship changed according to the cultivation season. During good years, the yield at experiment station was found to increase more rapidly than the yield on farm within the same district. This was mainly because the farmers were more interested in measuring their profit by limiting their input investments, while the experimenters only aimed at measuring yield and had no cost restraints.

Yield gap analysis becomes instrumental in measuring the magnitude of gap in the yields and in identification of constraints responsible for it. It is not proper to consider Yield Gap I in a study, as experiment station rarely encounters the constraints experienced by the farmers. Such estimates would be biased and larger than what it is actually under the farmer's condition.[5] Hence, Yield Gap II has been examined in the study. It was defined as the difference between the highest yield obtained by the most efficient farmer in the sample and the average level of yield achieved under farmer's condition.

4.3. YIELD CONSTRAINTS

The factors that prevent farmers from achieving the potential yield under farmer condition are known as 'yield constraints.

There are 3 kinds of constraints[6], which cause yield gap. They are (1) environmental constraint, (2) biological constraints, and (3) socio-economic constraints. Environmental constraints are caused by (i) environmental difference and (ii) non-transferable technology. Experiment stations are usually located in places ideal for farming, whereas the same is not true for farmer's field. Moreover, there are hardly any cost output constraints at these centres, while farmers often encounter such problems at farm level. Above all, some of the technologies adopted at the experiment station may not be transferable to a farmer's field. These constraints cause Yield Gap I. Biological constraints include (i) variety, (ii) weeds, (iii) diseases and insects, (iv) problem soil, (v) irrigation facilities and (vi) soil fertility. By and large, these constraints arise from the non-application of the required inputs.

Experiment station may not face such problems, while farmers often face them at the farm level.

Socio-economic constraints arise from (i) costs and returns, (ii) credit problems, (iii) tradition and attitudes, (iv) knowledge and (v) input availability of institutional facilities. It is the outcome of these constraints which prevents the farmers from adopting the technology as recommended. A farmer may consider the economic viability of following the new technology in terms of its cost and returns. Some farmers may not like to give up their traditional practices. Moreover, some aspects of the technology may not be understood by them. It also results from lack of institutional facilities like non-availability of inputs and credits. Biological and socio-economic constraints together contribute towards Yield Gap II.

4.4. HYPOTHESIS

There is no structural difference between small and large farmers producing onion.

5) METHODOLOGY

Designing a suitable methodology and selection of analytical tools are important for a meaningful analysis of any research problem. This section is devoted to discuss the methodology which includes sampling procedure, period of study, collection of data, method of analysis, tools of analysis and measures of variables.

6) SAMPLING PROCEDURE

Stratified multistage proportionate random sampling technique has been adopted for the study, taking Tirunelveli district as the universe, the taluk as the stratum, the village as the primary unit and onion cultivators as the ultimate unit.

Tiruneveli district comprises eleven taluks. Onion is mainly cultivated in Pavoorchatriam, Sankarankoil and Vasudevanallur.

A list of number of cultivation of onion in 2022-2023 for all the three taluks was prepared from the records of the Tirunelveli Statistical office.

The proportionate probability sampling technique was used to select 624 cultivators (25 per cent of total population in all three taluks from the list of onion cultivators and they were randomly selected.

7) COLLECTION OF DATA

Both primary and secondary data have been used for the present study. A reconnaissance survey was made in the selected area to get acquainted with the production and marketing activities involved under actual farming conditions. On the basis of the information collected, a well-designed pre-tested interview schedule (vide appendix) was drafted and used in the field survey to collect primary data. Before undertaking the main survey, a tentative interview schedule was prepared and administered to 624 cultivators in order to test the validity of the interview schedule. It facilitated the removal of the 'non-response' and unwarranted questions and the modified final schedule was prepared on this basis.

Three separate interview schedules were prepared to collect the required information from the market intermediaries namely the village traders, commission agents and the wholesalers and retailers of onion. Particulars regarding the method of purchase, cost of marketing, expenditure incurred on establishment charges, commission prices paid and received and the like were collected.

Secondary sources of data relating to location, climate, rainfall, soil type and utilization pattern, production, yield of major crops, cropping pattern infrastructural facilities and the like were collected from the office of the Assistant Director of Statistics, District Collectorate, Tirunelveli.

8) METHOD OF ANALYSIS

Keeping in view the objectives of the study, 624 sample cultivators were stratified into two categories namely small and large farmers. The farmers with less than five acres were grouped as small farmers and farmers with more than or equal to five acres were grouped as large farmers. Out of 624 sample respondents, 361, (66.6 percent) cultivators came under the category of small farmers and remaining 261 (33. 4 percent) fell under the group of large farmers.

9) ANALYTICAL FRAMEWORK

The socio-economic factors of the sample farmers are the major influencing factors on the yield, cost, returns and channels of distribution of multiplier onion. Though, there are many socio-economic factors, the present study confines itself to age, literacy level, family size, number of family member engaged in cultivation, size of operational holding and farming experiences.

Age-Wise Distribution of Sample Farmers

Sl. No	Age (in years)	Small Farmers	Large Farmers	Total
1.	Less than 30	41 (11.35)	30 (11.41)	71 (11.38)
2.	30-40	103 (28.53)	106 (40.30)	209 (33.49)
3.	40-50	141 (39.06)	91 (34.60)	232 (37.18)
4.	50 and above	76 (21.05)	36 (13.69)	112 (17.95)
	Total	361 (100.00)	263 (100.00)	624 (100.00)

Source: Survey data.

The most important factors that influence pattern of onion cultivation is the age of the farmers who is normally engaged in agricultural operation. More than 70 per cent of the respondents are in the age group of 30 to 50 years. The age group 40-50 is relatively higher (39.06 per cent) in the case of small farmers while it is only 34.60 per cent in the large farmers to their respective total. The farmers below 30 years constitute only below 12 per cent to the respective total. Those above 50 years form 21.05 per cent and 13.69 per cent respectively of small and large farmers.

Literacy Level of Sample Farmers

Sl. No	Literary level	Small Farmers	Large Farmers	Total
1.	Upto VIII	181 (50.14)	137 (52.09)	318 (50.96)
2.	+2	118 (32.69)	74 (28.14)	192 (30.77)
3.	Degree / Diploma	62 (17.17)	52 (19.77)	114 (18.27)
	Total	361 (100.00)	263 (100.00)	624 (100.00)

Source: Survey data.

Literacy level of the farmers influence the method of Cultivation, farm management and the like. It reveals that 50.96 per cent of the sample farmers have upto VIII standard followed by those with +2 and Degree/diploma namely 30.77 per cent and 18.27 per cent to the total. Upto VIII and Degree/diploma holders are higher among the large farmers while in the case of +2, the small farmers have a higher percentage (32.69 per cent) .The family size has been the most important factor in determining the requirements of family labour in farming operations.

Family Size of Sample Farmers

Sl. No	Family size	Small Farmers	Large Farmers	Total
1.	Less than 3	77 (21.33)	78 (29.66)	155 (24.84)
2.	3-5	193 (53.46)	138 (52.47)	331 (53.04)
3.	5 and above	91 (25.21)	47 (17.87)	138 (22.02)
	Total	361 (100.00)	263 (100.00)	624 (100.00)

Source: Survey data.

It is found that more than 75 per cent of the sample farmers have a family size of more than 3 members while only 22.02 per cent of the farmers have a family size of more than 5. The major dominant family size in the case of small farmers is 3to5 members which constitute 53.46 per cent to the total. While in the care of large farmers, it is 52.47 per cent.

Number of Family Members Engaged in Onion Cultivation

Sl. No	Number of Members	Small Farmers	Large Farmers	Total

1.	Below 2	179 (49.59)	126 (47.91)	305 (48.88)
2.	2-4	93 (25.76)	91 (34.60)	184 (29.49)
3.	4 and above	89 (24.65)	46 (17.49)	135 (21.63)
	Total	361 (100.00)	263 (100.00)	624 (100.00)

Source: Survey data.

It is inferred from the table 48.88 per cent of the sample farmers have utilized below 2 member of their family in onion cultivation, of which 49.59 per cent worked in small farmers and 47.91 per cent in large farmers. Out of 624 respondents, 29.49 per cent utilized 2to4 members in onion cultivation of which 25.76 per cent and 34.60 per cent are small and larger famers respectively. The 4 members and above are found 21.63 per cent, of which 24.65 per cent and 17.49 per cent are small and large farmers respectively. Thus, it is observed that small farmers used more family labour than the large farmers.

10) YIELD GAP AND YIELD CONSTRAINTS

In this section, an attempt has been made to analyse the yield gap with respect to small and large farmers producing multiplier onion in the study area. Further, it attempts to identify the important factors that act as constraints to the achievement of potential (Maximum yield obtained among the sample farmers) yield at farm level in the study area. In the present study, yield gap II has been adopted. Yield gap II is defined as the difference between maximum yield and average yield obtained under farmer's condition in the study area.

11) YIELD CONSTRAINTS IN ONION CULTIVATION

In this section, Garrett's Ranking Technique[7] is used to rank the factors that affected the yield of onion in the study area. Six factors that affect the yield of onion were identified and the farmers were asked to rank the factors in order of their importance. The order thus given by the farmer was converted into ranks by using the following formula:

$$\text{Percent Position} = \frac{100\,(R_{ij}-0.5)}{N_j}$$

Where

R_{ij} = Rank given for the i^{th} factor by j^{th} farmer

N_j = Number of factors ranked by j^{th} farmer.

The per cent position of each rank thus obtained was converted into scores by referring to the table given by Garrett.

Then for each factor the scores of individual farmers were added together and divided by the total number of farmers. These mean scores for all the factors were arranged in a descending order, ranks were assigned and the important factors identified.The ranks assigned to the six identified factors are given separately for small and large farmers

Yield Constraints of Small Farmers Producing Multiplier Onion in Tirunelveli District

Sl. No.	Constraints	Mean Score	Rank
1.	Inadequate credit facilities	60.38	I
2.	Inadequate water supply	56.63	II
3.	Severity of disease and pest attacks	50.71	III
4.	Non- availability of quality seed bulbs	48.92	IV
5.	Weeds	41.63	V
6.	Traditional methods of cultivation	38.81	VI

It is understood from inadequate credit facilities ranked first by small farmers as constraint faced in onion cultivation. It is followed by inadequate water supply, severity of diseases and pest attacks, non-availability of quality seed bulb, weeds and traditional methods of cultivation.

12) GINI COEFFICIENT

The Gini Coeffcient is used to measure the degree of inequality in per acre net return distribution. The Gini Coefficient is arrived at, using the formula,

$$G = 1 + \frac{1}{n} - \frac{2}{n^2 Y}\left[n Y_1 + (n-1) Y_2 + \cdots 2Y_{n-1} + Y_n \right] \quad \text{------(4.2)}$$

where

n = Number of farmers

Y = Per acre value of net income of farmer rank I ($y_1 < y_2 \cdots y_{n-1} < y_n$) and

Y = Mean net return

13) VARIANCE OF LOGARITHMS

In order to test the Gini Co-efficient, the variance of logarithms of the variables was used. The formula used for calculating the variance of logarithms was

$$\frac{1}{N} \sum \left(\log \frac{Z_1}{Z}\right)^2$$

Where

Z_i= Net return of the i_{th} farmer

Z = Mean net return of all the farmer and

N = Total sample size.

The 'F' test is used to test the difference between two variances of logarithms.

$$F = \frac{\sigma^2_1}{\sigma^2_2}$$

where

= Variance of the small farmers and

= Variance of large farmers.

Gini Coefficient for Small and Large Farmers Cultivating Multiplier Onion

Sl. No	Particulars	Gini Coefficient
1.	Small Farmers	0.0789
2.	Large Farmers	0.1702

It is inferred from Table 4.15 that Gini coefficient for small farmers is 0.0789 and for large farmers, it is 0.1702. The higher value of coefficient of large farmers implies that the inequality in the distribution of net return is higher for large farmers than small farmers. To test the Gini coefficient, variance of logarithm has been estimated by assuming the variables to be log normally distributed with mean μ variables. The difference between Small farmers and large farmers was tested using F-ratio.

Variance of Logarithms for Small and Large Farmers Cultivating Multiplier Onion

Sl. No	Particulars	Variation of Logarithm
1.	Small Farmers	0.0012
2.	Large Farmers	0.0131
3.	F^*	10.92
4.	$F_{(8.608)}$	1.98

The Gini coefficient indices for small and large farmers were tested with variance of logarithms in cultivation of multiplier onion. The computed variance of logarithms for small farmer is 0.0012 and for large farmers, it is 0.0131. The calculate F value was 10.92 which was higher than the table value of F at (8.608) degrees of freedom. Hence, it is concluded that there is a significant difference between the degree of inequality between small and large famers in the study area.

14) SUMMARY OF FINDINGS

Family members participating in agricultural activities were found to be high in small farmers than large farmers. Family size has also found high in small farmers than large farmers. Majority of the farmers were found to have a very long association with the cultivation of multiplier onion in the study area. Hence, this long association of farmers led to better productivity and earns maximum profit in onion cultivation.

The input-output structure revealed that there was a significant variation in terms of yield in quintals per acre between small and large farmers. Thus, it may be concluded from the analysis that the large farmers produced higher yield than the small farmers. The significant difference between the two groups was found in the use of human labour, fertilizer, Pesticides and seed bulbs.

Thus, it may be concluded from the analysis of cost and return structure of Onion cultivation that the large farmers benefitted more in terms of both yield and net returns per acre. It showed that this could be the outcome of better economics and institutional position in large farmers compared with small farmers in study area.

Comparing the nature and the extent of per acre net return distribution, it was observed that the concentration frequencies in the distribution per acre net return effected was positively skewed for both small and large farmers.

Regarding the extent of variation, Gini co-efficient indicated that the inequality in the distribution of per acre net return was higher for large farmers compared to small farmers. The logarithm of variance test showed that there is a significant difference in the degree of inequality of per acre net return between small and large farmers.

The results of regression equation fitted to the different categories of farmers as well as to the pooled category have significantly explained that the variables influenced the yield of onion were human labour, farm yard manure and area under onion cultivation. Among these significant variables, area under onion cultivation had a greater influence on the yield of onion. The regression model fitted was highly significant in all categories of farms.

In order to examine the structural difference between small and large farmers, Chow's test was applied. The results revealed that there existed a structural difference between small and large farmers only at the slope level. At the slope level, variables namely human labour and capital flow were responsible for the difference in yield. At the intercept level, the co-efficient of dummy variable was not statistically significant. It indicates that there was no difference with regard to technical change in both groups.

The anlaysis of yield gap revealed the existence of a gap between the potential and actual yield per acre for both farmer groups. The yield gap was found higher in the case of large farmers than in the case of small farmers.

The retention of onion accounted for 3.18 per cent, 5.08per cent and per cent in small, large and pooled category of farmers. More than 75 per cent of the retention was found to be for seed purpose. Marketable surplus of onion was found to be nearly 95 per cent of the total production.

The channels through which the onion was marketed was identified as three namely village traders, wholesalers/retailers and commission agents. The availability of credit facilities from commission agents and absence of storage cost were found to be the major reasons influencing the selection of middlemen for the sale of onion.

15) SUGGESTIONS

The farmers in the study area were of the opinion that they could not achieve the maximum yield due to severity of diseases and pest attacks. It is suggested that farmers should be educated properly to apply the pesticides at the prescribed level and this could be done through the Agricultural Development Officials attached to the Panchayat unions.

Non-availability of credit was one of the important constraints. It is suggested that financial institution should revitalize and revamp the existing credit facilities in the study area so that the farmers could get timely credit for undertaking improved cultivation practices.

The onion cultivation on large scale was found to be more remunerative than on small scale. Since onion requires intensive cultivation, high yielding varieties, more labour and water as compared to other crops, this crop may not be desirable in labour and water scarcity areas. It is observed during the survey that the large farmers possess more experience and practical knowledge than the small farmers. Hence, it is suggested that the small farmers have to be educated and trained on gaining more technical knowledge about onion cultivation.

Market intelligence system should be thoroughly over-handed and improved. Existing techniques of disseminating marketing information should be reviewed. In order to increase the profitability of the onion cultivators, Government should start an Agri-business Corporation for marketing both in domestic as well as in international markets.

16) CONCLUSION

It is concluded from the analysis that due to excessive supply during the crop reason the onion cultivators are not getting the remunerative prices for their produce. The seasonal fluctuations in the onion prices could be reduced up to a certain level by creating adequate storage facilities. Scientific storage facilities should be provided at village level and it market level. With the effective implementation of the suggestions by the policy makers, planners and the authorities concerned, the onion cultivators would get a better remunerative price for their produce. This would go a long way in improving the economic conditions of the onion cultivators.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

My thesis- " An Economic study on production and channels distribution of multiplier onion in Tirunelveli district in Tamilnadu" -2023 Edition