

Factors Influencing Crop Diversification in Tirunelveli District of Tamil Nadu

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Abstract

This paper analyzes the factors influencing crop diversification in Tirunelveli district of Tamil Nadu. Crop diversification is nothing but a shift in cropping pattern, shift from traditionally grown less benefit crops to more benefit crops to increase the income as well as agricultural sustainability. To cope up with the risk arise due to mono cropping, crop diversification can be used as a better strategy. It reduces the risk to farmer from total crop failure by providing alternative means of income through other crops grown. It also helps in conservation of natural resources, increases food and nutritional security and helps in poverty alleviation by providing employment opportunities to the farmers. We studied about the factors influencing crop diversification in Tirunelveli district of Tamil Nadu using the primary data. Non - Experimental Research design was used for this study purpose. A sample size of 120 respondents was fixed for the study using proportionate random sampling technique. Out of twenty two variables selected for the study, variables viz., Family size, Distance to the market, Economic motivation, Risk orientation, Innovativeness and Scientific orientation had positive and significant association with crop diversification at one per cent level of significance.

Keywords: Crop diversification, Intensive farming, Sustainable Agriculture, Tamil Nadu, India.

Introduction

Indian agriculture facing distress due to disparities in the income of the farmers and non-agricultural workers. To overcome this problem, Government of India set a goal for doubling

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the income of farmers by 2022-2023. Crop diversification can be used as a better strategy to achieve this goal and to reduce the disparities in income of the farmers and non-agricultural workers. The aim of crop diversification is to grow more number of crops in a given area such that the farmer may not depend on a single crop. Risk may be reduced by growing more number of crops than growing single crop. Introducing variety of crops also leads to increase in production as well as agricultural sustainability. In India, small farm sizes characterizes agriculture. The average farm size is about 1.57 ha. About 93 per cent of the farmers have farm size smaller than 4 ha. They contribute about 55 per cent of total cultivable land. Only 1.6 per cent of farmers having farm size of more than 10 ha and they contribute about 17.4 per cent of total cultivable land. After Green revolution, there is continuous rush for diversified agriculture in terms of crops. Indian agriculture shifted towards non-cereal crops in order to increase the income and agricultural sustainability. It reduces the risk to farmer from total crop failure by providing alternative means of income through other crops grown. It also helps in conservation of natural resources, increases food and nutritional security and helps in poverty alleviation by providing employment opportunities to the farmers. In this paper an attempt was made to study the factors influencing crop diversification in Tirunelveli district of Tamil Nadu.

Objective:

To study the factors influencing crop diversification among the selected respondents.

Review of literature:

Cho et al. (2016) found that farming experience, farm size, access to irrigation and distance to the market were the variables found to have positive effect on crop diversification and significant, while age of household head was found to be significant but had negative effect on crop diversification respectively.

Lawin et al. (2017) concluded that age of farmers, education level of farmers and distance to market were the variables found to be significant and had positive effect on crop diversification, while family size was found to be significant but had negative effect on crop diversification.

Sichoongwe et al. (2014) observed that farm size and distance to market were found to be significant and had positive effect on crop diversification, while age of farmers was not significant and had negative effect on crop diversification respectively.

Kankwamba et al. (2012) reported that gender and education level of farmers had negative effect on crop diversification, while family size of farmers had positive effect on crop diversification.

Benin et al. (2004) found that education level of farmers had negative effect on crop diversification respectively.

Joshi et al. (2004) revealed that education level of farmers and distance to the market were the variables found to have positive effect on crop diversification.

Minot et al. (2006) observed that education level of the farmers had positive effect on crop diversification respectively.

Van Dusen and Taylor (2005) found that family size of the farmers found to have negative effect on crop diversification.

Aneani et al. (2011) reported that family size, farming experience and farm size of the farmers had negative effect on crop diversification.

Ashfaq et al. (2008) and Rahman (2008) found that farming experience of the farmers was found to be significant regarding diversification of crops respectively.

Mithiya et al. (2018) found that farm size and per capita income of the farmers were found to have positive effect on crop diversification, while access to irrigation had negative effect regarding crop diversification.

Aheibam et al. (2017) reported that farm size of the farmers were found to be not significant towards crop diversification respectively.

Basavaraj et al. (2016) revealed that farm size, irrigation, house hold income and access to market were the variables found to be determinants of crop diversification.

Kasem et al. (2010) found that the labour forces of the farmers were found to be not significant and had negative effect on crop diversification respectively.

Birthal et al. (2005) stated that irrigation facilities of farmers was found to be not significant regarding crop diversification.

Ibrahim et al. (2009) found that distance to market was found to be significant and had positive effect on crop diversification respectively.

Materials and Methods:

The study was based on the primary data collected among the selected respondents. A sample size of 120 farmers was fixed as respondents. The 120 respondents were identified from the selected six villages from three blocks by applying proportionate random sampling method. A list of 22 independent variables that could possibly influence the crop diversification were prepared. The variables were Age (X_1), Gender (X_2), Educational status (X_3), Occupational status (X_4), Family size (X_5), Farming experience (X_6), Farm size (X_7), Annual income (X_8), Labour availability (X_9), Area under diversification (X_{10}), Source of irrigation (X_{11}), Distance to the market (X_{12}), Social participation (X_{13}), Information source utilization (X_{14}), Decision making (X_{15}), Economic motivation (X_{16}), Risk orientation (X_{17}), Innovativeness (X_{18}), Scientific orientation (X_{19}), Credit orientation (X_{20}), Attitude of farmers towards crop diversification (X_{21}) and Trainings undergone (X_{22}).

To find out the degree of relationship between the variables and crop diversification Pearson's product moment correlation co-efficient was calculated. It was calculated by using the following formula.

$$r = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left(\sum x^2 - \frac{(\sum x)^2}{n}\right) \times \left(\sum y^2 - \frac{(\sum y)^2}{n}\right)}}$$

Where,

N	-	Sample size
$\sum xy - (\sum x)(\sum y)/n$	-	Sum of product of x and y
$\sum x^2 - (\sum x)^2/n$	-	Sum of square of x
$\sum y^2 - (\sum y)^2/n$	-	Sum of square of y

The 't' test of significance was used to test the significance of the 'r' value, using the formula.

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}} \sim t_{(n-2)}df$$

Where,

- n - Sample size
r - Correlation co-efficient value

Results and discussions:

Correlation analysis was performed to find out the association of independent variables with crop diversification. The results are presented in the table 1.

Table 1. Association of Profile Characteristics with Crop Diversification

S. No	Characteristics	Coefficient of correlation (r)
1.	Age	0.085 ^{NS}
2.	Gender	-0.0151 ^{NS}
3.	Educational status	0.042 ^{NS}
4.	Occupational status	-0.055 ^{NS}
5.	Family size	0.646 ^{**}
6.	Farming experience	-0.078 ^{NS}
7.	Farm size	0.026 ^{NS}
8.	Annual income	-0.047 ^{NS}
9.	Labour availability	0.108 ^{NS}
10.	Area under diversification	0.008 ^{NS}
11.	Source of irrigation	0.127 ^{NS}
12.	Distance to the market	0.333 ^{**}

13.	Social participation	0.045 ^{NS}
14.	Information source utilization	-0.147 ^{NS}
15.	Decision making	-0.149 ^{NS}
16.	Economic motivation	0.297**
17.	Risk orientation	0.252**
18.	Innovativeness	0.307**
19.	Scientific orientation	0.438**
20.	Credit orientation	0.059 ^{NS}
21.	Attitude of farmers towards crop diversification	-0.041 ^{NS}
22.	Trainings undergone	0.139 ^{NS}

*Significant at 0.005 level **Significant at 0.001 level NS - Non significant

It could be seen from the table, where the correlation value of the variables, family size (X_5), distance to the market (X_{12}), economic motivation (X_{16}), risk orientation (X_{17}), innovativeness (X_{18}) and scientific orientation (X_{19}) had positive and significant association with crop diversification at one per cent level of probability.

The rest of the variables age (X_1), gender (X_2), educational status (X_3), occupational status (X_4), farming experience (X_6), farm size (X_7), annual income (X_8), labour availability (X_9), area under diversification (X_{10}), source of irrigation (X_{11}), social participation (X_{13}), information source utilization (X_{14}), decision making (X_{15}), credit orientation (X_{20}), attitude of farmers towards crop diversification (X_{21}) and trainings undergone (X_{22}) showed non-significant association with crop diversification.

Conclusion:

The overall assessment showed that out of twenty two variables, six variables viz. family size, distance to the market, economic motivation, risk orientation, innovativeness and scientific orientation had positive and significant association with crop diversification at one per cent level of probability. This clearly evident that these factors influence farmers to practice crop diversification. There existed a medium level of expression from among

the farmers with the psychological variables like Economic motivation, Risk orientation, scientific orientation and Credit orientation. These are the factors that directly influence adoption. This indicates the need for an integrated extension effort to motivate the farmers to go for improved diversification practices. It was also found that most of the farmers had medium level of innovativeness and medium level of Information source utilization which shows that efforts can be made to intensify extension efforts by narrowing down the farmers' extension ratio in the state department.

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