Crop-diversification in Uttar Pradesh: Evidence of village study

Dr. M.K. Sharma, Dr. Vinit Kumar and D. Yadav,*

Giri Institute of Development Studies, Lucknow,
* Deptt. Of Economics, BBAU Central University

ABSTRACT

Crop Diversification Index and multiple linear regression analysis have been used to analyze the nature and extent of crop diversification in the selected villages in state of Uttar Pradesh. The socio-economic factors influencing CDI in each crop season were examined using regression analysis. Expenditure on fertilizers and percent operational area of gross cropped area were found to have significant effect on CDI all seasons of crops and almost all the villages, while some where availability of electricity has found significant. The study has suggested that the creation of basic facilities of cultivation like expenditure on fertilizer, electricity availability and required area of cultivation for livelihood is an essential pre-requisite for creating enabling conditions for fostering the process of agricultural development and crop diversification, as most of these parameters are found to influence the nature and extent of crop diversification.

Keywords: *Crop-diversification index, multiple regression models.*

INTRODUCTION

Crop diversification in India is a pungent applied concept to remove the plight of subsistence agricultural economy and to ensure diversified nutrition status of the poor countrymen. Crop diversification means rising of a variety of crops involving intensity of competition amongst field crops for arable or cultivable land. The main advantage of the study of diversification in a region lies in the fact that it enables us to understand the impact of physical and socio-economic conditions on the agriculture. Moreover, it helps us in knowing the contemporary competition among crop for area, for rotation and effect on double cropping, total production and per hectare productivity (Bhalsing, 2009). Indian agriculture is predominantly a small peasant based economy with approximately 80% of the operational holdings being below two hectares, and 34% of the agricultural land are cultivated by them (GoI, 1997). Because of small operational holdings, it is indeed very difficult by the small farmers to improve their earnings only by raising the yields of the existing crops, mainly cereals. Attention on high value crops with available modern farm inputs may provide a stable economic base of the poor peasants (De and Chattopadhyay, 2010).

The incidence of crop diversification in India, however, was very uncommon particularly before the introduction of new agricultural technology in the mid-sixties. With the advent of new agricultural technology particularly, water seed-fertilizer technology, a significant change in land allocation towards some high value cash crops such as fruits and vegetables cultivated particularly by the small farmers is observed in India (Joshi *et al*., 2006).

To meet the challenges of a globalizing market in agriculture as well as the growing and changing needs of the population many countries in

South East Asia have undertaken crop diversification to enhance productivity and cultivate high value crop with positive outcome. These countries are gradually diversifying their crop sector in favour of high value commodities, especially fruits, vegetables and spices. Diversification is taking place either through area augmentation or by crop substitution. If carried out appropriately, diversification can be used as a tool to augment farm income, generate employment, alleviate poverty and conserve precious soil and water resources. Studies by Pingali and Rosegrant (1995), and Chand (1996) support this positive impact of diversification.

The Uttar Pradesh is popularly known for the agriculture in the country, which having most vulnerable regions in terms of land, soil, topographic etc. It has diverse and complex agro-ecological situations marked by frequent flood and drought conditions. Rice and wheat is major crops of marginal and small farmers of Uttar Pradesh and other corps like pulses, coarse grain, oilseeds etc. grown by all categories of farmers while cash crop like sugarcane paying vital role of income for the medium and large farmers. The crop production in U.P. is constrained by various socio-economic factors such as family size, operational land holding of farmer or farm-size, availability of electricity, input like fertilizer, agriculture machinery majorly tractor, education level, membership of agricultural societies etc. These socio-economic factors play an important role in making crop diversity. All varieties are not suited for all ecosystems and there is greater variation of producing potential in each region of Uttar Pradesh. Therefore, there is varying nature of adoption of crops influenced by socio-economic factors and thereby considerable strength of crop diversity. Keeping the view mentioned above we have tried to explore the nature and extent of crop diversification of rural population. Generally primary occupation of rural population of Uttar Pradesh is agriculture. However we cannot forget all the households are not having any land. A roughly estimated of land less households are varying from 30 to 55 per cent of village population, it might be possible through urbanization, migration and indebtedness. Only households who were engaged in farming have been considered

Data and Methodology

Sources of Data

The present study is based on primary data and survey has been conducted in 2013. This survey was conducted in four villages selected from the four different economic regions of Uttar Pradesh. The villages were selected based on composite measure of Socio-Economic Status (SES) and village size. This procedure was done in two stages. In the first stage, district from each region which has an average SES of the region have been selected. In the second stage, a village which has average SES of the district has selected. Therefore, the selected village roughly represents the district average SES status. Gohanakala village in Lucknow district of Central region, Senapur village in Jaunpur district of Eastern region, Pandari village in Chitrakoot district in Bundelkhand region, Shimali village in Muzzafarnagar district of Western region have been selected. A census survey conducted in the villages that all the households in the villages were enumerated with structured schedule. The numbers of households are as 503 for Gohanakala, 471 for Senapur, 368 for Pandari 368, and 296 for Shimili have been found.

The households were classified into four group on the basis of land holdings viz., marginal (up to 2.5 acre), small (2.5 to 5.0 acre), medium (5.0 to 10 acre) and large (10 and above acre). Of the total surveyed household of State, the contribution of land holders are as 72%, 54%, 72% and 44% while land less were 28%, 45%, 28% and 38 for Gohanakala, Senapur, Pandari, and Shimali, respectively. The Table 1 shows also the contribution of different types of farmer's category along with total households.

Table 1: Total and sample households according to category of farmers and land less

Villages	Marginal Farmers	Small Farmers	Medium Farmers	Large Farmers	Total Farmers	Land Less	Total Household
Gohanakala	327 (65.01)	30 (5.96)	5 (0.99)	0 (0.00)	362 (71.97)	141 (28.03)	503 (100.00)
Senapur	235 (49.89)	14 (2.97)	10 (2.12)	0 (0.00)	259 (54.99)	212 (45.01)	471 (100.00)
Pandari	182 (49.46)	63 (17.12)	18 (4.89)	3 (0.82)	266 (72.28)	102 (27.72)	368 (100.00)
Shimali	99 (33.45)	18 (6.08)	14 (4.73)	2 (0.68)	133 (44.93)	163 (55.07)	296 (100.00)
Total	843 (51.47)	125 (7.63)	47 (2.87)	5 (0.31)	1020 (62.27)	618 (37.73)	1638 (100.00)

Values in parenthesis are percentage

Methodology

The nature of crop diversification is first examined through changes in allocation of land towards the cultivation of different crops grown over the year. Different diversity indices have been used to measure the degree of diversification in area under study. Inter crop variation in output is also considered over the period under consideration.

Diversity Index

Diversification index is calculated for the villages as well as the different crop season viz. Kharif, Rabi and Zaid for the period of study. Diversification may be broadly defined as a shift of resources from low value agriculture to high value agriculture as indicated by Vyas (1996). It can also be considered as a shift of resources from farm and non-farm activities or simply a larger mix of diverse and complementary activities within agriculture. There are different methods of measuring diversification. Further, depending on data limitations, measurements of diversification in cropping pattern can be examined using the land under cultivation in different cropping season. There are quite a few measures of diversification; important ones include Herfindal Index, Simpson Diversity Index, Ogive Index and Entropy Index. Properties of a diversification measure, however, will also need to reflect the nature of problem studied. Each method has some special features and some limitations. Considering the objective of this study of assessing the extent of diversity in crop the Simpson Diversity Index has been used.

The Simpson Diversity Index measures the extent of diversity and is calculated as follows:

$$DI = 1 - \sum_{i=1}^{n} (P_{ij})^2 \qquad \text{or} \qquad DI = 1 - \sum_{i=1}^{n} \left(\frac{a_{ij}}{A_i} \right)^2$$

where

P_i = Proportionate area of the j^{th} crop corresponding to i^{th} farmers in the GCA

a_{ij} = Area under j^{th} crop corresponding to i^{th} farmer

A_i = Total area planted under various crops by i^{th} farmer

n = Number of crops grown by i^{th} farmer

The index ranges between 0 and 1. If there is specialization then the index moves towards zero.

The Determinants

The determinants of diversification from traditional cropping pattern to modern cropping pattern have been identified. Pingali and Rosergrant (1995) has shown evidence that diversification out of staple food was triggered by rapid technological change in agricultural production, improved rural infrastructure and diversification in food demand. These are broadly characterized as supply and demand side forces.

Several socio-economic factor as independent variables were tried to reach at the best fit equations. The estimated value of parameters shows the relative importance of each factor in crop diversification. It is followed by a comparative study of the diversity indices and finally the regression results are presented which gives a clear cut idea of the factors affecting diversity in the cropping pattern.

In order to identify the factors determining the level of diversity in crop, linear multiple regression models has been applied i.e.

$$Y_i = a + b_1 X_{i1} + b_2 X_{i2} + \ldots + b_n X_{in} + e_i$$

The model was fitted using least square technique.

Y_i is the value of CDI corresponding to i^{th} farmer. X_i's are the various socio- economic factors corresponding to the i^{th} farmer, a and b_i's are unknown parameters of the model. e_i is the error term which is assumed to follow normal distribution with mean zero and a constant variance σ^2.

In the present study, the X_i's are taken as:

X_1 = Family size

X_2 = Percent area of gross cropped area (GCA)

X_3 = Expenditure on fertilizer per acre

X_4 = Number of years in school (respondent)

X_5 = Availed electricity facility

X_6 = Membership of societies

X_7 = Ownership of tractors

Results and Discussion

Crop-diversification

Crop-diversification index has been computed for each season of the crops as well as overall for all the crops. This has been calculated for each farmer and for each category of the farmers. The effect of socio-economic factors on crop-diversification index has been studied. The results are presented as under:

Crop-diversification in different cropping seasons

All the crops grown by the selected farmers were divided in three different seasons viz., Kharif, Rabi and Zaid, respectively, and the farmers were classified according to land holding as marginal (up to 2.50 acre), small (2.5 to 5.00 acre), medium (5.00 to 10.00 acre) and large (10 and above) farmers. No large farmers have been found in Luknow and Jaunpur district due to splitting of land and urbanization. The table 2 shows status of crop diversification index for all cropping season and along with four villages which are under study.

Table 2: Crop diversification index in different season of different

Size of the farm	Kharif	Rabi	Zaid	Overall
Gohanakala (Lucknow District, Central Region)				
Marginal	0.82	0.71	0.99	0.52
Small	0.85	0.77	0.98	0.61
Medium	0.77	0.85	0.00	0.61
Large	0.00	0.00	0.00	0.00

Total	0.82	0.72	0.99	0.53
Senapur (Jaunpur District, Eastern Region)				
Marginal	0.74	0.79	0.00	0.53
Small	0.81	0.86	0.00	0.67
Medium	0.84	0.88	0.00	0.72
Large	0.00	0.00	0.00	0.00
Total	0.75	0.80	0.00	0.54
Pandari (Chitrakoot, Bundelkhand Region)				
Marginal	0.85	0.58	0.00	0.43
Small	0.88	0.81	0.00	0.69
Medium	0.91	0.77	0.00	0.68
Large	0.94	0.89	0.00	0.83
Total	0.86	0.64	0.00	0.50
Shimali (Muzaffarnagar, Western Region)				
Marginal	0.93	0.66	0.98	0.57
Small	0.97	0.66	0.99	0.63
Medium	0.98	0.60	0.99	0.58
Large	0.99	0.41	0.00	0.40
Total	0.94	0.65	0.98	0.57

The marginal and small farmers were found to have maximum CDI in Zaid other than Kharif and Rabi because they grow more crops in Zaid other than Rabi and Kharif. This is interesting result and it is probably because of number of vegetable crops have been taken by the farmers in Zaid season and due to requirement of family livelihood. In case of Kharif season the small farmers having more diversified as compare to marginal and medium, however, in Rabi season medium farmers have more CDI as compare to other.

The Rabi season has been found high CDI as compare to Kharif season in Senapur village. It is also notable that the farmers of Senapur were not taking any crop in Zaid season due to their backwardness or unawareness of new technology. In Kharif and Rabi season the medium farmers having more CDI as compare to other due to size of land holding.

The Kharif season has been found high CDI as compare to Rabi season in Pandari village. It is also notable that the farmers were not taking any crop in Zaid season due to their unfavorable climatic condition and backwardness of new technology. In Kharif and Rabi season the large farmers having more CDI as compare to other due to size of land holding.

The farmers of Shamili having high CDI in Zaid reason as compare to Kharif and Rabi season because they are efficient for cultivation and entire agriculture calendar showing thereby more crop-diversification being adopted by them. It is well known that the Western region of Uttar Pradesh having important place terms of crop production. The farmers of Western region are more progressive and land is also fertile. CDI of Kharif season is following the size of land holding of farmers. In Rabi

season the marginal and small farmers having more CDI as compare to medium and large due to meet out their family requirement. In Zaid season there is no more crop for growing so that the farmers having equal CDI in Zaid season except the large farmers due to insufficient of number of farmers.

The crop diversification index for Kharif, Rabi and Zaid cropping season were represented that the farmers of Central region (Gohanakal village of Lucknow district) and Western region (Shimali village of Muzaffarnagar district) were more diversified as compare to Eastern region (Senapur village of Jaunpur district) and Bundelkhand region due to favorable climatic condition, timely input supply and belonging to developed region. Eastern region having good soil condition and also climatic condition, but the unawareness, untouched to latest farming technology, biasness of officials for government programme are major cause to less diversity. While, the Bundelkhand region is suffering to climatic condition as drought and only dependency of rainfed crops.

Effect of different factors on CDI in Kharif, Rabi and Zaid

Present session dealing the forces, which are affecting the diversification in favour of more crop in the state a number of explanatory variables were used. Diversification is influenced by a number of forces both from the supply side as well from the demand side (Bhattacharyya, 2008). The explanatory variables of the study are Family size, Percent area of gross cropped area, Expenditure on fertilizer per acre, Number of years in school (respondent), Availed electricity facility, Membership of societies and Ownership of tractors used. The multiple linear regression model with Generalized Least Square has been used for the factor affecting the crop diversification. The test the overall significance of model, we calculate measure of determination (R^2). Hence the model passes the overall goodness of fit test at both 5% and 1% level of significance.

Gohanakala (Lucknow District, Central Region)

Table 3 presents the results of regression analysis to determine the factors influencing CDI in Kharif, Rabi and Zaid cropping seasons for Gohanakala village of Lucknow district. CDI varies with variation in seasons i.e., Kharif, Rabi and Zaid. Their measure of determination (R^2) showing significant at 1% are 75.6, 86.5 and 85.6 for Kharif, Rabi and Zaid, respectively. It is also found that percent area of GCA has significant impact on CDI at 1% level and negative values of regressor shows that any increase the GCA will decrease CDI for all cropping season. One change is also notable here is the important of expenditure on fertilizer in CDI i.e., positive but very insignificant to affect in the Kharif and Rabi season. It is due to major corps like rice, pulses, oilseeds, wheat, sugarcane cultivated in these seasons and no more option for Zaid season.

Table 3: Effect of different factors on CDI in Kharif, Rabi and Zaid for Gohanakala (Lucknow District, Central Region)

Factors	Kharif		Rabi		Zaid	
	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)
Constant	1.0300 (0.0260)	75.60	1.3890 (0.0440)	86.50	0.9940 (0.0060)	85.60
Family size (X_1)	0.0010 (0.0020)		0.0020 (0.0020)		0.0010+ (0.0000)	
Percent area of gross cropped area (X_2)	-0.0050** (0.0000)		-0.0130** (0.0000)		-0.0030** (0.0000)	
Expenditure on fertilizer per acre (X_3)	0.00001** (0.0000)		0.00002** (0.0000)		0.00000 (0.0000)	
No. of years in school (X_4)	0.0010 (0.0000)		0.0040 (0.0000)		0.0000 (0.0000)	
Availed electricity (X_5)	0.0020 (0.0070)		-0.0130 (0.0120)		0.0030+ (0.0020)	
Membership of societies (X_6)	-0.0110 (0.0100)		0.0010 (0.0160)		-0.0010 (0.0020)	
Ownership of tractors (X_7)	0.0210 (0.0160)		-0.0250 (0.0260)		0.0070 (0.0040)	

* P <0.05 is significant at 5%, ** P <0.01 is significant at 1%, + P <0.10 is significant at 10%
Figures in parenthesis are standard error

Senapur (Jaunpur District, Eastern Region)

The result shows in Table 4 showing values of regressor as well as their significance level for Senapur village of Jaunpur district. The measure of determination (R^2) showing significant at 1% are 76.80, 55.50 and 99.60 for Kharif, Rabi and Zaid, respectively. In this region percent area of GCA plays same role as negatives incidence in CDI as for Central region. It is due to huge occurrence of small land holder which is also reflecting in Table 1. Availability of electricity in Kharif season is showing significant performance due to need of regular irrigation for plenty of crops along with rice in nut cell percentage of GCA for determination crop diversification index for this region.

Table 4: Effect of different factors on CDI in Kharif, Rabi and Zaid for Senapur (Jaunpur District, Eastern Region)

Factors	Kharif		Rabi		Zaid	
	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)
Constant	1.4930 (0.0940)	76.80	1.1470 (0.0860)	55.50	1.0010 (0.0010)	99.60
Family size (X_1)	0.0001 (0.0020)		0.0010 (0.0020)		0.0000 (0.0000)	
Percent area of gross cropped area (X_2)	-0.0120** (0.0000)		-0.0070** (0.0000)		-0.0050** (0.0000)	
Expenditure on fertilizer per acre (X_3)	0.00000 (0.0000)		0.00000 (0.0000)		0.00000 (0.0000)	
No. of years in school (X_4)	0.0030 (0.0000)		0.0040 (0.0000)		0.0000 (0.0000)	
Availed electricity (X_5)	-0.1830* (0.0570)		0.0160 (0.0540)		-0.0010 (0.0010)	
Membership of societies (X_6)	0.0120 (0.0310)		-0.0240 (0.0300)		0.0001 (0.0000)	
Ownership of tractors (X_7)	0.0380 (0.0360)		-0.0050 (0.0350)		0.0000 (0.0010)	

* P <0.05 is significant at 5%, ** P <0.01 is significant at 1%, + P <0.10 is significant at 10%
Figures in parenthesis are standard error.

Pandari (Chitrakoot, Bundelkhan Region)

The Table 3 presents the results of regression analysis to determine the factors influencing CDI in Kharif, Rabi and Zaid season. The table shows that in Zaid only one factor i.e. percent area of GCA is performing and another is not due to Bundelkhand region is known as dry area. Therefore it is indicating that no more crops were grown in Zaid season in aforesaid region. From regression analysis it is found that the percent area of GCA, expenditure on fertilizer significantly affecting the crop diversification at 1% level of significance for Kharif and Rabi season and availability of electricity facility significantly affected by 10% probability of level of significance for both season. It is also found that the coefficient of determination (R^2) is also supporting as 69.50%, 74.40% and 99.90% for Kharif, Rabi and Zaid cropping seasons, respectively. Another factor membership of societies is also showing the significant effect on CDI in Kharif seasons. Although the estimates of percent area of GCA, expenditure on fertilizer, electricity and membership of societies is however negative implying that crop diversification decreases with the increase of area under crop, expenditure on fertilizer, electricity and membership of agriculture societies. This means that crop diversification will be more applicable when the area under crop will large with high input and electricity facility for irrigation; and membership of agriculture society will be more helpful for the diversification of agricultural corp.

Table 5: Effect of different factors on CDI in Kharif, Rabi and Zaid for Pandari (Chitrakoot, Bundelkhan Region)

Factors	Kharif		Rabi		Zaid	
	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)
Constant	1.2440 (0.0480)	69.50	1.4370 (0.0730)	74.40	1.0000 (0.0000)	99.90
Family size (X_1)	0.0040 (0.0030)		0.0030 (0.0050)		0.0000 (0.0000)	
Percent area of gross cropped area (X_2)	-0.0060** (0.0000)		-0.0090** (0.0000)		-0.0010 (0.0000)	
Expenditure on fertilizer per acre (X_3)	-0.00006** (0.0000)		-0.00009** (0.0000)		0.00000 (0.0000)	
No. of years in school (X_4)	0.0020 (0.0000)		-0.0001 (0.0000)		0.0000 (0.0000)	
Availed electricity (X_5)	-0.0430** (0.0150)		-0.0490+ (0.0230)		0.0000 (0.0000)	
Membership of societies (X_6)	-0.0390+ (0.0160)		-0.0460 (0.0250)		0.0000 (0.0000)	
Ownership of tractors (X_7)	0.0000 (0.0000)		0.0000 (0.0000)		0.0000 (0.0000)	

* P <0.05 is significant at 5%, ** P <0.01 is significant at 1%, + P <0.10 is significant at 10%

Figures in parenthesis are standard error

Shimali (Muzaffarnagar, Western Region)

The results show various values of regression analysis of factor affecting CDI of Shimali village of Muzaffarnagar district of Western Region. This region is commonly known as agriculturally sound area. The most influencing factor of CDI for this region is percent area of gross cropped area for Kharif and Rabi season with negative parameters due to large number of small land holder. Expenditure on fertilizer, availability of electricity and ownership of tractors also showing significance at 10%, 5% and 10%, respectively, for Rabi reason. It might be possible that farmers are sound cropping tool and techniques. In the Zaid season the family size and showing significant at 10% due to the farmers using family person for cultivation. Another factor i.e. member of societies shows significant at 1% level of significance with the negative indication of parameter. It might be possible they are not taken account of knowledge from agricultural societies or they believe on traditional pattern of cultivation.

Table 6: Effect of different factors on CDI in Kharif, Rabi and Zaid for Shimali (Muzaffarnagar, Western Region)

Factors	Kharif		Rabi		Zaid	
	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)	Regression coefficient	R^2 (%)
Constant	1.0290 (0.0180)	86.70	1.4810 (0.0740)	77.50	1.0090 (0.0070)	88.60
Family size (X_1)	0.0000 (0.0010)		0.0020 (0.0040)		0.0010+ (0.0000)	
Percent area of gross cropped area (X_2)	-0.0050** (0.0000)		-0.0120** (0.0010)		-0.002000 (0.0000)	
Expenditure on fertilizer per acre (X_3)	0.00000 (0.0000)		0.00003+ (0.0000)		0.00000 (0.0000)	
No. of years in school (X_4)	0.0020 (0.0000)		-0.0020 (0.0010)		0.0010 (0.0000)	
Availed electricity (X_5)	-0.0060 (0.0060)		-0.0700* (0.0270)		-0.0050 (0.0030)	
Membership of societies (X_6)	0.0010 (0.0050)		-0.0090 (0.0200)		-0.0080** (0.0020)	
Ownership of tractors (X_7)	0.0130 (0.0070)		0.0570+ (0.0270)		-0.0010 (0.0030)	

* P <0.05 is significant at 5%, ** P <0.01 is significant at 1%, + P <0.10 is significant at 10%

Figures in parenthesis are standard error

Conclusion

The results of the study shows that agricultural sector of Uttar Pradesh is gradually diversifying towards high value crops (sugarcane, maize etc.), off-season cultivation of vegetables, high yield varieties food grains and fruits. The findings explores that most of the diversification has came through individual efforts of the marginal, small farmers with quite low support from the government policies. It is due to food security issues in light of state level and as well as country level. It is also the self sufficiently in cereals as looking like dream. However, the pace of crop diversification is quite slow and is much less than that of the country as a whole. Moreover the degree of diversification is not evenly distributed over the districts under study. While two districts namely Lucknow and Muzzafnagar are picking up diversification quite rapidly others are lagging behind. This might be because of the facts that even though they are belong to rich and developed area and also state policy is favouring the self sufficiency in staple food. Still an issue is going to grow which is reduce the cropping area during the last few years. The livelihood and inflation during the period, crop diversification is going to high in terms of small land holders.

However, the socio-economic indicator plays a crucial role in bringing about the actual development and improvement in the income level of the impoverished farmer. One major factor of this change is the percent area of GCA which has induced farmers to shift towards cultivation of more crops. Diversification is more prominent in irrigated area like Gohanakala, Senapur and Shamili villages than in rainfed region. In fact the rainfed areas are becoming the hub of non-cereals due to their low

water requirement and abundant labour supply. However, cost of cultivation is relatively low and high value crops are going to popular among the marginal and small farmers but they cannot afford the cost of high investment with inadequate cropping area, lack of agricultural machinery etc. It is also remarkable of proper institutional support is lacking and hence the speed of diversification is affected. It is therefore necessary to provide proper financial resources, guidance and encouragement and training for modern cultivation techniques would be part of the government to attract the farmers of the state towards the sustainable cultivation. This will not only help the farmers in earning higher income, it will also open up opportunities of marketability and also of export and thereby create more income and employment.

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