Crop Diversification Intensity In Villupuram District Cross Section Data Analysis

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ABSTRACT

This study focuses on the farming community has responded to the changing consumption patterns of consumer by diversifying its production portfolio towards high – value food commodities. Experiences from many developing countries have revealed about the changing production portfolio at the farm level due to altering dietary pattern Besides rising income levels, the expanding urbanization, increasing infrastructural development and liberalization of trade policies have been identified as factors that triggered the process of agricultural diversification out from the area of staple food production Despite, a silent revolution in the high value food segment, performance of the agricultural sector was not as impressive as that of the overall economy of the country. About 56 per cent of the total cropped area of the state is under irrigated conditions while around 44 per cent of the area was under dry land farming. The contribution of agriculture to state income is around 13 per cent in 2008-09. It supplies raw-materials to agro based industries besides providing employment opportunities to the rural population. In this context, crop diversification intensity in villupuram district cross section data analysis. The changing scenario of agriculture has forced the farming community and policy makers in agriculture to search for a more remunerative and viable production portfolio. Key Words: Performance of the agricultural sector, Total cropped area, The expanding urbanization, Agricultural diversification

Introduction and statement of problem

Faster growth in agriculture is central to rural development and poverty reduction in Tamil Nadu. Although agriculture accounts for only 14% of Tamil Nada’s GDP growth, non farm income accounts for about 50% of rural house hold income. Rejuvenating agriculture growth remains critical since a vibrant agriculture sector encourage industrial growth. Farm income accounts for 78% of the income of the poorest 20% of the rural population. Growth in labor intensive agriculture could further reduce rural poverty through higher yields to small producers, higher real wages to agriculture laborers and increased income and employment opportunities with forward and background linkage to the rural non-farm sector.

In all India level as well as in Tamil Nadu (TN) the following agricultural scenario exist: the dropping of land available for food grain cultivation, fragmented holding of land; restrictive and out dated land laws that do not give farmers enough flexibility, over dependence on agriculture for employment due to slow growth of non-farm sector in villages; just 4% of the global freshwater resource supporting 16% of the world population in India; adverse effect of drought on production of crops; over dependence on monsoon; over exploitation of water; no new technological breakthrough in recent years; soil fatigue due to over-exploitation of nutrients and organic matter in intensive cropping areas, nutrient imbalance due to use of improper combination of fertilizers, non-availability of quality seeds resulting in low seed replacement; inadequate or poor harvest management infrastructure at the farm level and poor marketing mechanism. Among the serious problems that confront farms, access to water, credit, technology and markets are the most important ones.

Diversification into higher values, lees water – intensive products such as fruits, vegetable, spices and livestock products is one of the promising sources of future agriculture growth because , Tamil Nada’s agro-climatic conditions are well suited for diversified agriculture Rapidly increasing incomes and changing pattern of food demand also provide opportunities for diversification in the state. This will also generate new rural and non-farm employment opportunities and contributes to higher rural incomes. The State Planning Commissions Report (2004) of TN may be referred for various alternate cropping patterns suited to different agro-climatic zones. Cotton, sunflower, soybean, various pluses and vegetables and fruits are all being recommended in the place of paddy / sugarcane.
The required reforms included: an extension which could respond to market signals for diversified agriculture, facilitating efficient markets with adequate mechanisms for market intelligence, establishing effective and functional rural credit market, developing insurance and safety to cushion against the risk of diversification and the delivery packages to improve farmer income associated with gradual adjustment of input pricing. Investments in processing both public and private sectors need to be considerably increased. The implementation of Precision Farming in some TN districts to be extended in all districts through which crop diversification could be brought out so that crop and water productivity could be enhanced. Inadequate transport work is also a major constraint which is being Government of Tamilnadu addressed by GOTN. The Possibility of developing effective insurance system for individual farmers in conjunction with the National Horticultural Mission or any other GOTN schemes should be exploited; Contract farming involves business agreement between a farmer and firm in which the firm provides inputs, extension services processing and a ready market in return for a guaranteed source of supply of the output product. Increasing involvement of proper contract farming for high value and export crops is a must.

However there are many other important issues which need to be addressed to reinvigorate agriculture. This includes the following optimum use of consolidation of land holdings, support to small farmers to grow high value crops. Land policy reforms, increased public investment in agriculture and infrastructure diverting labour to activities like food processing, creating additional irrigation potential repairing irrigation system deficiencies and inefficient on-farm water management, addressing the issues like ground water extraction watershed development and rain water harvesting, increasing irrigation efficiency, promoting organic farming, developing farmers – centric marketing system, converging different technology missions operating in agriculture like those dealing cotton, pulses and oil seeds, rain-fed authority etc, so that dry land farmers could derive integrated effort, development of tools for farmers to better manage risks both natural and induced and increased.

Rationale for Crop Diversification

The VIII plan has adopted Agricultural Diversification as a strategy for income augmentation and employment generation (Government of India, 1992). This strategy is particularly relevant for enhancing the economic opportunities of the small and marginal farm group whose economic viability is deteriorating fast due to variety of reasons. Not only their farm size is small to take advantage of scale economies, but also their productivity level is very low as compared to other farm groups, partly due to their weaker position in rural input and output markets.

While all farm groups are affected by the phenomenon of rising cost of cultivation (Nadkarni, 1988; Acharya, 1992), smaller farms, whose rate of return from crop cultivation is already precarious, are particularly vulnerable to the problem of escalating cost of cultivation. Added to this was the disturbing trend in the income contributed mainly by low value addition in crop cultivation (Vyas, 1994) due to their cereal- based specialization and self- sufficiency- centered production pattern.

It is in this respect, diversification both within crop enterprise, i.e towards high value crops like vegetables and horticultural crop as well as across enterprise and activities, i.e., promoting judicious activities is being advocated as a strategy for the development of small and marginal farm groups.

Concepts

Cropping Intensity

Cropping intensity refers to the ratio between the Gross area sown and the Net area sown.

Cropping pattern

Cropping pattern refers to the proportionate area under different crops.

Crop Diversification

Crop diversification means, production shifted from: low value to high value crops; water loving crop to water saving crop; single crop to multiple/mixed crop, crop alone to crop with livestock- fish-aquaculture.
Review of Literature

Cleick (2003), discussed that agriculture is in a state of transition throughout the world, and at the global level, agricultural pattern had been changing with remarkable intensity and diversity and this evolution is being driven by multiple complex and interacting forces related to production, consumption, trade and political regimes. These changes had a considerable effect on relative input and output prices and put certain producer in precarious position while treating those more suited to demand patterns favorably. The public and private sector had each adopted different roles over time in response to technical opportunities and social demands though in many parts of the developing world both remain ill defined and far from socially optimal.

Dorosh and Sur (2004) examined the changes in cropping pattern and the degree of diversification at districts level in Tamil Nadu. It is one of the fast transition state economies in India. In developed economies, the percentage of population depending on agriculture declines as the proportion of agricultural contribution to the GDP declines. This phenomenon had not occurred in the country as well in the state. While agricultural sector growth rate in Tamil Nadu was among the highest in India during the 1980s and early 1990s, deceleration growth was observed since 1990’s. Therefore, growth in this sector becomes important. Meanwhile, agriculture had also undergone crop diversification in many regions and specialization in few regions in the state. A shift from agriculture led economy to service sector driven economy is a sign of the maturing economy.

Pingali and Rose grant (1995), explained that the diversification reflected a change in business activities based on the flexible and differentiated response to changing opportunities created by new production technology or market signals. More specifically, diversification was the result of change in product, choice and input use decisions based on market force and the principle of profit maximization. At the farm level, diversification represented a change in the underlying characteristics of the farm system such that farm practices and products are more aligned with the social, environmental and economic contexts, as well as the constraints and opportunities that exist. At the community level, diversification implied establishing a dynamic optimal mixture of farmer production alternatives capitalizing between farm heterogeneity in terms of resource availability.

Pradeep Kumar Mehta (2009) examined the link between different dimensions of diversification and the growth of output in India in the last three decades. The results showed that there was a mixed picture regarding the topology of diversification within the states. Some states exhibited more diversification in terms of number of crops, but also had less proportional area under high value crops. Also, there was no direct link between the number of crops and spread in the cropping pattern. In terms of relationship of diversification with income and risk an inverse and positive relationship of increasing spread of the cropping pattern is found.

Research Issues

1. Do the farmers want to diversify their crops for commercial purpose to get more profit?
2. What are the other difficulties faced by the farmers in crop cultivation besides irrigation availability?

Based on the above stated research issues, the following objectives and hypotheses are framed.

Objectives

1. To revealed crop diversification intensity in villupuram district distract.
2. To comprehend the land use pattern of the sample village is presented the crop diversification practices of the farmers in Villupuram district.
3. To suggest policies to increase the agricultural development in Villupuram district.

Hypotheses

To give specific focus to the objectives of the present study, the following hypotheses are formulated and tested with appropriate statistical tools

1. To study the intensity of crop diversification varies between irrigated and unirrigated farms.
2. The land use pattern of the sample village is presented crops practices of the farmers in Villupuram district.

Sources of Data
The present study is based on Primary and secondary data. The information’s relating to the crop pattern change at the district level is collected from Season and Crop Reports for twelve years from 1998-2009. Primary data are collected from 200 farmers selected from 8 villages in two blocks in Villupuram District.

Sampling procedure
In order to analyze the intensity of crop diversification, a sample survey is done by choosing one dry block and one irrigated block in Villupuram District. In each block, four villages are selected at random. In each village, by using disproportionate random sampling technique, 25 sample farmers are selected. Totally 200 sample farmers are selected from the 8 village in the blocks.

Statistical Tools
The study employed the following statistical tools to test various hypotheses
1. A sample survey is done by choosing one dry block and one irrigated block in villupuram District by using disproportionate random sampling technique,
2. Diversification indices are constructed by selecting suitable indicators

Crop Diversification Intensity in Villupuram District
The crop diversification levels of Villupuram District. In order to analyze the intensity of crop diversification, a sample survey is done by choosing one dry block and one irrigated block in villupuram District. In each block, four villages are selected at random. In each village, by using disproportionate random sampling technique, 25 sample farmers are selected. Totally 200 sample farmers are selected from the 8 villages in the two blocks. The land use pattern of the sample village is presented in (Table-1.1)

Table -1.1
Land Use Pattern in Sample Villages of Gingee and Kallakkuruchi Blocks in Villupuram District.

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Name of the Village</th>
<th>Geographical Area (ha)</th>
<th>Net Cropped Area(ha)</th>
<th>% age of Net Cropped Area to the Total Geographical Area</th>
<th>Irrigated Area(ha)</th>
<th>Percentage of Irrigated Area to the Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kallakkuruchi</td>
<td>528.205 (31.18)</td>
<td>272.245 (27.80)</td>
<td>51.54</td>
<td>247.945 (31.36)</td>
<td>91.07</td>
</tr>
<tr>
<td></td>
<td>Neelamangalam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Thatchur</td>
<td>478.995 (28.24)</td>
<td>301.775 (30.82)</td>
<td>63.00</td>
<td>278.925 (35.27)</td>
<td>92.43</td>
</tr>
<tr>
<td>3</td>
<td>Eravar</td>
<td>351.315 (20.71)</td>
<td>8.730 (1.06)</td>
<td>55.82</td>
<td>127.45 (16.11)</td>
<td>64.99</td>
</tr>
<tr>
<td>4</td>
<td>Melur</td>
<td>337.085 (19.87)</td>
<td>208.825 (21.33)</td>
<td>61.95</td>
<td>136.300 (17.23)</td>
<td>65.27</td>
</tr>
<tr>
<td></td>
<td>Over all</td>
<td>1695.6 (100)</td>
<td>978.965 (100)</td>
<td>232.31</td>
<td>790.625 (100)</td>
<td>78.44</td>
</tr>
<tr>
<td>1</td>
<td>Gingee Block</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Karai</td>
<td>666.565 (40.148)</td>
<td>332.390 (40.59)</td>
<td>49.87</td>
<td>218.030 (34.48)</td>
<td>65.5</td>
</tr>
<tr>
<td>2</td>
<td>Athiyur</td>
<td>258.265 (15.55)</td>
<td>110.815 (13.53)</td>
<td>42.90</td>
<td>104.480 (16.52)</td>
<td>94.2</td>
</tr>
<tr>
<td>3</td>
<td>Ananthapuram</td>
<td>97.765</td>
<td>8.730</td>
<td>8.92</td>
<td>8.730</td>
<td>100</td>
</tr>
</tbody>
</table>
The sample farmers are classified as small, medium and large as per their farm size and the distribution of the sample farmers in 8 villages are shown in Table 1.2

**Table 1.2**

<table>
<thead>
<tr>
<th>Sl No</th>
<th>Farm size</th>
<th>Gingee Block</th>
<th>Kalakkuruchi Block</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>I KI</td>
<td>II AR</td>
</tr>
<tr>
<td>1</td>
<td>Small Farm (02-10 ha)</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Medium Farm (2-10 ha)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Large Farm in 10 ha and above</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>25</td>
<td>25</td>
</tr>
</tbody>
</table>

**Source:** Computed from village Gr. Return Figures.

Table 1.3

**Cropping Pattern of Sample Farms**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Farm Category</th>
<th>Paddy</th>
<th>Sugarcane</th>
<th>Millets</th>
<th>Tobacco</th>
<th>Cotton</th>
<th>Groundnut</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gingee Block</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Small Farmers</td>
<td>6.25 (10.02)</td>
<td>10 (16.03)</td>
<td>0.5 (0.80)</td>
<td>1.0 (1.60)</td>
<td>24.05 (38.5)</td>
<td>20.55 (32.95)</td>
<td>62.35 (100)</td>
</tr>
<tr>
<td>2</td>
<td>Marginal Farmers</td>
<td>25.85 (33.01)</td>
<td>15.12 (19.31)</td>
<td>0.1 (100)</td>
<td>0.5 (0.63)</td>
<td>7.28 (9.29)</td>
<td>29.45 (37.61)</td>
<td>78.3 (100)</td>
</tr>
<tr>
<td>3</td>
<td>Large Farmers</td>
<td>120.11 (198.12)</td>
<td>140.51 (25.5)</td>
<td>0.6 (0.108)</td>
<td>20.8 (3.78)</td>
<td>85.50 (15.56)</td>
<td>182.80 (33.20)</td>
<td>550.32 (100)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>152.21 (22.02)</td>
<td>165.63 (23.96)</td>
<td>1.6 (0.23)</td>
<td>22.3 (3.22)</td>
<td>117.03 (16.93)</td>
<td>232.8 (55.56)</td>
<td>961.17 (100)</td>
</tr>
</tbody>
</table>

**Kallakkuruchi Block**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Farm Category</th>
<th>Paddy</th>
<th>Sugarcane</th>
<th>Millets</th>
<th>Tobacco</th>
<th>Cotton</th>
<th>Groundnut</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Small Farmers</td>
<td>7.50 (10.74)</td>
<td>5(7.16)</td>
<td>25 (35.8)</td>
<td>3.5 (5.01)</td>
<td>10.05 (14.39)</td>
<td>18.75 (1.43)</td>
<td>69.8 (100)</td>
</tr>
</tbody>
</table>
1.1 Background of Sample Villages

Based on the geographical area of the sample villages, Karai in Gingee block and Neelamangalam village in Kallakkuruchi block are the largest villages. For the sample as a whole, net area sown is 1797.765 hectares of which 1152.905 hectares are irrigated (Table-1.1) 85.5 of net sown area is irrigated in Gingee block and only 78.44 is irrigated in Kallakkuruchi block. Irrigation is the crucial factor for technology, adoption by the farmers and the availability of poor irrigation facilities hinder the peasant to apply the chemical fertilizer, improved seeds and modern equipments. Thus it may be inferred from the table that the farmers in the irrigated block could go in for high level of technology adoption as they are blessed with more irrigation facilities.

The sample farmers is Gingee block are 59 in number in large farm size and 10 in kallakkuruchi block as presented in Table -1.2 The medium and large farmers account for 41 in Gingee block. Against this in Kallakkuruchi block, which is irrigated only 62 is found in large and medium farm sizes.

Table-1.3 exhibits the cropping pattern of the sample farmers in Gingee block and Kallakkuruchi block. The cropping pattern revealed that paddy, sugarcane groundnut and cotton are the major crops grown in 893.18 hectares of the total cultivated area of 1030.08 hectares which forms 86.70 of the total area. In Gingee block 22.02 of the total area 691.567 is under paddy cultivation and 23.96 under sugarcane cultivation whereas, sugarcane is not raised in the sample village of kallakkuruchi block. Paddy is in 53.8 hectares in Kallakkuruchi block, mainly for household requirement. 33.56 of the area are under groundnut cultivation in Gingee block and only 22.11 is the area under groundnut cultivation in Kallakkuruchi block. Cotton is raised in 17.33 of the total area in Kallakkuruchi block. Only 16.93 of the total area of 691.57 hectares in under cotton in Gingee block.

From cropping pattern of the sample farms it may be noted that even though Gingeei block receives scanty rainfalls, paddy is grown by the farmers using pump set only. Since the crop requires water for a continuous period than any other crops, millets like, cholam, cumbu, varagu, samai, and tobacco are raised by the farmers in Kallakkuruchi block in 113.4 hectares and this shown that the farmers in this block diversify their crops to minimize the risk in growing other crops.

Conclusions

This paper gives the finding and the policy suggestions of the present study on crop diversification intensity in villupuram district. The measures of crop diversification are generally used in the cross section data, each defined in terms of area proportion and net crop income proportion.

1. The farmers in the irrigated block could go in for high level of technology adoption as they are blessed with more irrigation facilities.

2. From cropping pattern of the sample farms it may be noted that even though Gingeei block receives scanty rainfalls, paddy is grown by the farmers using pump set only.

3. The farmers in this block diversify their crops to minimize the risk in growing other crops.
Depending on rainfall as a major source of irrigation, the farmers in Gingee area, do not cultivate the crop like paddy and sugarcane in more hectares as these crops require water for a long period after sowing. These farmers thus avoid risk by cultivating crops which require less amount of water.

**Policy Suggestions**

From the finding of the present study, a few policies could be suggested for the agricultural development of Villupuram district. The small farmers could not diversify their crops because of their small holding. The government may take steps for co-operative farming so that crop diversification can take place from traditional crops to commercial crops.

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