

Group Farming and Organic Agriculture: Mean to End Poverty and Boost Village Economy

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Abstract

Even though Gudupatichervu is showing a positive trend, but the cost of the seeds, saplings, pesticides, fertilizers and labour is consistently increasing and the net return from the crop is relatively low in year 2016-17. But when farmers adopted organic method and started using organic manure and pesticides prepared in village helps to cut down all initial costs and increased yield. The village, where Amrita SeRVe is working formed farmers group and begins organic farming on a share of their collective land. It generates employment opportunities, helps in production improvement and encourages adoption of Chilly Crops during Rabi Season. In economical aspect it's a clear shift from linear to circular economy. Usually Livestock production and agriculture are mainly linear in structure, but at Gudupatichervu village where farmers used input fertilizers and pesticides which enriches soils, microclimate and other relevant husbandry parameters. Farmers used local level of agricultural inputs at optimal level, ensuring that they use the minimum resources needed at the production stage to achieve good production with minimal environmental impact. **Using Pearson correlation coefficient** able to measures the strength between variables and relationships in two different years (2017-18 and 2018-19). The positive trend show how farmers are able to reduce the initial cost of chilli farming after forming farmers club in 2018-19 compared to 2017-18. It directly contributing to 'Circular Economy', it's a clear shift from linear to circular economy. Over thirty members came together in a meeting to discuss their new Co-operative which they named the 'Amrita Gudipaducheruvu Organic Farmers Group' formed in June 2018. The villages having 149 families with an average population of 650 belongs to Chinchu, Reddy, Nayak and Yadav castes.

Keywords: Organic Farmers Group, Gudipaducheruvu, Guntur, Andrapradesh, chili, Teza Lepakshi chili, Economic Benefits, Employment Generation, **Pearson correlation coefficient**

INTRODUCTION

The village is blessed with a beautiful lake which is a catchment area where water inflow comes from surrounding hills, but due to lack of rain the lake is completely dry. The water level goes down every year. There are 5 borewells and 3 hand pumps in the village out of which only three are able to supply water and ground water is getting depleted. The village is facing acute shortage of water and it may continue to face if the present scenario of water management continues, until the lake is cleaned and water is lifted from river or reservoirs.

Smallholders in the Gudipaducheruvu village are affected by a vulnerability to drought and depletion of groundwater resources in a context of climate change and climate variability. In 2018 rain didn't hit the area and seriously affected by drought and farmers left farming and reduced the activities to 50 acres of land and doing chili.

The group expressed, they are keen to learn new ideas and ways of natural farming from the Amrita SeRve team and other supporters of organic agriculture. They agreed that of the total 250 acres between them – which currently produce chilies, rice & cotton – they would initially cultivate 50 acres using organic methods. At this first meeting each member committed 200 Rs to start a joint bank account to manage the income and expenses, and they also appointed a President, Secretary and Treasurer. The study is about how group farming help farmers to come together, collectively purchased saplings, preparing fertilizers and pesticides and sell their products and make a reasonable profit by cutting down all initial costs. When group farming started farmers planned and purchased seeds and sapling which helps to reduce the price to half. It helps to robust village economy and showing clear shift from linear to circular economy.

Initially thirty farmers planned to do Teza Lepakshi chili farming in 2018-19 on fifty acres of land due to limited access to water. Chillies are a priority crop mostly produced by smallholder farmers. The group will now start holding weekly meetings to plan how to reduce all the initial costs and make agriculture profitable. The Group enhanced the participants' knowledge of the application of Good Agricultural Practices (GAP), Comparative Study of Previous Years, Good Harvesting Practices (GHP), proper post-harvest care, processing, as well as the identification of potential markets.

Approach

From their previous experience farmers learned that those who are not part of a farmer group will face difficulty in gaining input subsidies or capital funds and has to purchase all the materials at higher cost. Initially, when individual farmers inquired the price of the Teza Lepakshi fine variety of Guntur Chili, the cost was fixed at 2 Rs/Sapling. The minimum number of sapling requirements per acre land was 18,000. Cost of Planting Material within prescribed limits per acre was Rs 39,600. (Including Sapling Cost, loading and unloading cost, Transportation).

When farmers come together and planned to purchase the sapling, they started inviting quotation for sapling from different nursery. The best price group got was

One Rupees /Sapling including loading charges, unloading charges and delivering at the village. The total cost reduced was Rs half means 21,600 Rs saved /acres on sapling itself.

SL No	Particulars	Year		Year	
		2017-18(X Values)		2018-2019(Y Values)	
	Process Involved	Units	Amount (Rs)	Units	Amount (Rs)
1	Land preparation (Ploughing)	Acres//Rs	3000	Acres//Rs	2500
2	Sapling (Teza Lepakshi)	Acres//Rs	39600	Acres//Rs	18000
3	Nursery bed preparation	Acres//Rs	700	Acres//Rs	500
4	Transplanting	Acres//Rs	2500	Acres//Rs	1500
5	Weed Control & Inter cultivation	Acres//Rs	1000	Acres//Rs	500
6	Fertilizers	Acres//Rs	3000	Acres//Rs	700
7	Pesticides	Acres//Rs	3000	Acres//Rs	700
8	First hand weeding	Acres//Rs	1000	Acres//Rs	500
9	Second hand weeding	Acres//Rs	1000	Acres//Rs	500
10	Spraying pesticides	Acres//Rs	1500	Acres//Rs	1000
11	Harvesting	Acres//Rs	2000	Acres//Rs	2000
	Total		58300		28400

Selection of Study Area

Chilli is the most important commercial crops at Gudipaduchervu and plays a dominant role in agricultural economy of the village. As part in all adopted village of Amrita SeRVe; core area of development is agriculture.

Sampling Design

Thirty farmers from Gudupatichervu village were selected. The farmers were contacted individually for collection of details on method of chillies farming with the help of well structured and pre-tested interview schedule. The primary data were collected from the sample respondents during the months of July, 2018 and also collected the secondary data of farming activities in year 2017-18 July with the help of village coordinators.

METHODOLOGY

Farmers checked the Soil with the help of Indian Institute of Rice Research (IIRR),Hyderabad and find soils rich in organic matter with pH range 6.5-7.5.

Season of sowing

September- October

Sampling Rate

One Rs/Sapling

Variety: Teza Lepakshi

Nursery area: 50 sq.m / acre.

Nursery Bed Preparation

Nursery bedding is usually raised from ground level and is prepared by thorough mixing with compost and sand. About 40 - 45 days Ideal nursery beds should be of 1m width, 40 m long and 15 cm height. Seedlings grown in this bed are enough to transplant in one acre main field.

Transplanting

30-35 days old Sapling is used for transplantation. Transplanting is done during the month of November. Farmers followed 45cm X 30 cm spacing between saplings and with a plant population of about 18000 per acre are considered optimum.

Irrigation

Irrigation should be done judiciously. Usually Chili can't withstand heavy moisture and number of irrigation and intervals between irrigation were after 2 days. Flowering and fruit development in Chili is the most critical stages of water requirement which observed in regular interval of time and water were adjusted accordingly.

Manuring

Organic manures such as farmyard manure is applied @ 3.5 tons /acre. Farmers used jeevamrutham and compost/farmyard manure from own farm. Many Liquid bio-fertilizers are prepared by farmers in a village which having special liquid formulations containing not only the desired microorganisms and their nutrients or cysts for longer shelf life and tolerance to adverse conditions. The Training on Organic farming was given by Agriculture officer of KVK, Macherla.

Pest Management and Diseases

Fruit rot & Die back caused by *Colletotrichum capsici* and bacterial wilt are the two major diseases found in the area. Small, circular to irregular, brownish black scattered spots appear on leaves and small circular yellowish to pinkish sunken spots appear on fruits. The effectiveness of the soil amendments and bio-control agent (Ground nut cake+ Poultry manure+ Neem cake (10+10+5Kg's)) at 15 days interval not only reduces the disease intensity on chilly but also results in higher healthy yield and benefit ratio.

Bacterial leaf Spot: The leaves exhibit small circular or irregular, dark brown or black greasy spots. As the spots enlarge in size, the center becomes lighter surrounded

by a dark band of tissue. Seed treatment is very important to avoid the disease, but as for farmers there is no control over seeds and no provision to know that seeds must be obtained from disease free plants. To control Bacterial leaf Spot Spraying with a baking soda solution (a tablespoon of baking soda, 2 1/2 tablespoons of vegetable oil, a teaspoon of liquid soap, not detergent, to one gallon of water), or neem oil and spray it at the interval of two weeks.

Harvesting

Chile is highly perishable in nature. It requires more attention during harvest, storage and transportation. Harvesting should be done at the right stage of maturity. The crop is ready for harvesting in about 90 days after transplanting. For one acre they got around 14 to 15 quintal (one quintal=100kg) and prices of 8700 to 9000 Rs/ Quintal. For each farmer got the average price /acres is Rs 1,21,800 (14*8700 minimum) .Average profit each farmer got after harvesting was Rs 93,400/Acres.(Sale Price-Actual Expense).

Despite of all difficulties such as drought they have shown the courage not too left in between but to fight against all odd situations. But by 2019-2020 the situation changed an they got a good amount of Rain. Now they are doing farming on 150 acres of land.

Economic Benefits & Employment Generation.

Using Pearson correlation coefficient able to measures the strength between variables and relationships in two different years (2017-18 and 2018-19). The positive trend show how farmers are able to reduce the initial cost of chilli farming after forming farmers club in 2018-19 compared to 2017-18.

X Value	Y Value	M _x	X - M _x	Y - M _y	(X - M _x) ²	(Y - M _y) ²	(X - M _x)(Y - M _y)
3000	2500	5300	-2300	2581.818182	5290000	6694.215	188181.818
39600	18000		34300		1176490000	237720330.6	528843636.4
700	500		-4600		21160000	4333966.942	9576363.636
2500	1500		-2800		7840000	1170330.579	3029090.909
1000	500		-4300		18490000	4333966.942	8951818.182
3000	700		-2300		5290000	3541239.669	4328181.818
3000	700		-2300		5290000	3541239.669	4328181.818
1000	500		-4300		18490000	4333966.942	8951818.182
1000	500		-4300		18490000	4333966.942	8951818.182
1500	1000		-3800		14440000	2502148.76	6010909.091
2000	2000		-3300		10890000	338512.397	1920000
58300	28400				1302160000	266156363.6	585080000

Key

X: X Values

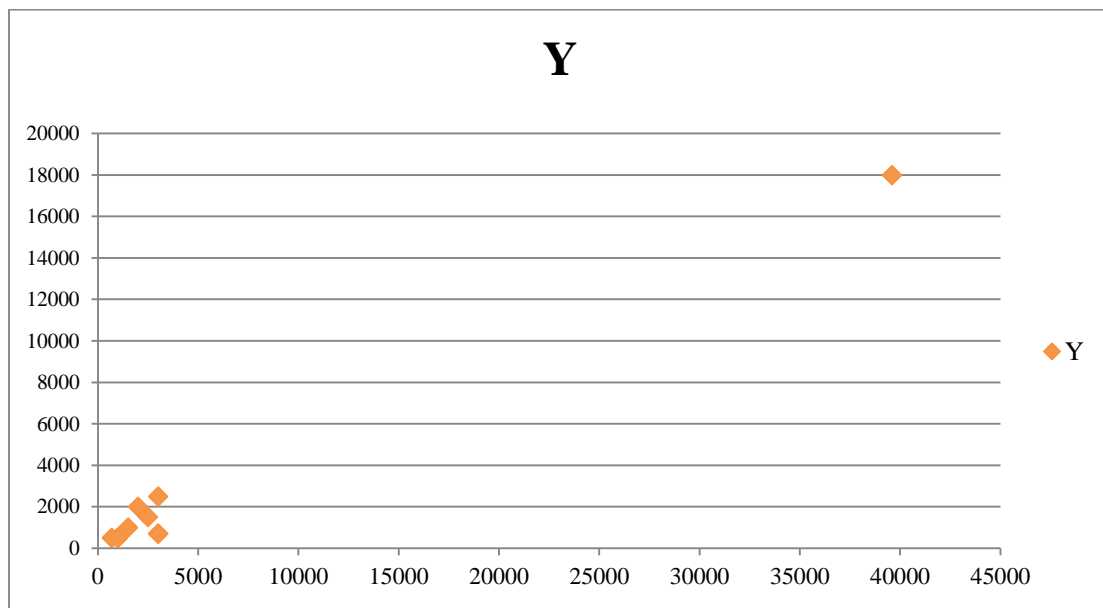
Y: Y Values

 M_x : Mean of X Values M_y : Mean of Y Values $X - M_x$ & $Y - M_y$: Deviation scores $(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared $(X - M_x)(Y - M_y)$: Product of Deviation Scores**RESULT DETAILS & CALCULATION*****X and Y Combined****X Values* $N = 11$ $\Sigma = 58300$ $\Sigma(X - M_x)(Y - M_y) = 585080000$

Mean = 5300

 $\Sigma(X - M_x)^2 = SS_x = 1302160000$ *R Calculation* $r = \Sigma((X - M_x)(Y - M_y)) / \sqrt{(SS_x)(SS_y)}$ *Y Values* $\Sigma = 28400$ $r = 585080000 / \sqrt{(1302160000)(266156363.636)} = 0.9938$

Mean = 2581.818

 $\Sigma(Y - M_y)^2 = SS_y = 266156363.636$ *Meta Numeric's (cross-check)* $r = 0.9938$ 

The value of R is 0.9938.

This is a strong positive correlation, which means after started group farming and switch towards organic farming in 2018-19; farmers are able to reduce all the initial cost and that is one of the reason which Chilly farming at Gudupaticlervu showing positive trend.

The results indicate that many other important findings related to economic aspects of chilli. Economically, employment provides income to poor families once farmers start a greenhouse at village. Average income from one acre of land/year from chilli is around Rs 93,400. There are various ranges of economic aspects mainly including sapling, which they are purchased by giving higher, prices (Theja -70 ps; No5-Rs 1.25 ps and T4 -1-Rs 2). So average lost were (higher price= 40000 Rs/acre). 150 acres of land where farmers cultivate chilies and average loss were Rs 60, 00000 /year for purchasing sapling, which were consider as economic loss of village.

Average employment per acres is 35 persons for ninety days and the average wages per day is 500 Rs. It generates employment opportunities, helps in production improvement and encourages adoption of transgenic crops. In economical aspect it's a clear shift from linear to circular economy. Usually Livestock production and agriculture are mainly linear in structure, but at Gudipaducheruvu village where farmers used input fertilizers and pesticides which enriches soils, microclimate and other relevant husbandry parameters. Farmers used local level of agricultural inputs at optimal level, thereby ensuring that the minimum resources needed are used at the production stage in order to achieve good production with minimal environmental impact. It directly contributing to 'Circular Economy' and the whole money revolves inside the village once the nurseries were set and economy of village will robust. Chili farming addresses the use of minimal levels of invested resources that is essential to achieving sustainable agricultural production.

Formulating new ideas

The policies related to improvement of chilli cultivation need to be formulated based on local specific requirements. Once we start nursery at village and provide proper training to SHG members on maintaining, planting, preparation of pesticides and fertilizer, then it helps to solve unemployment problems too large extend. The money, which is generated from raising chili sapling, should be transferred to women SHG groups.

Rehabilitating the agricultural sector after drought and enabling farmers to grow the right crops, process them, and get them to market are key steps in the economic recovery. It also addresses the extreme end of poverty and solves the unemployment problem.

CONCLUSION

In Gudipaducheruvu, growth rates of area, production and productivity has increased due to the effective extension work and good rain. After forming the farmers' group the cost of fertilizer, pesticides, sapling and labour is drastically reduced and bargaining power of farmers increased. Production and the net return from the crop shows positive trend. Fertilizers and Pesticides are the major input that involves 50% purchase cost which drastically reduced when farmers started preparing locally. Similarly, the price of sapling and hiring labour is also costly and it's difficult to find agricultural labours during the season. But after the formation of farmers group, farmers started doing activities collectively the purchase price of sapling was reduced to half the price, Labours are adjusted from the village itself; The input- output flow shows that through group farming farmers are more responsible and discussion are collective. The main findings is that chill at Gudipaduchervu provided positive net returns, promotion of organic farming to nearby villages, especially the low-nutrient-consuming tribal villages in and around the village The success offers great potential to enhance soil and crop productivity along with the livelihood security for the people. The group farming not only addresses unemployment, but also boosts up rural economy. . Thus, the government must come forward with new schemes for organic farming and support group farming and help farmers to set new nurseries so that more SHG members are engaged in maintenance and production of sapling.

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