

DIVERSIFICATION OF LIVELIHOOD FOR THE MARGINAL COCONUT FARMERS: A REPLICABLE MODEL

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Coconut exists traditionally as a part of the rural food system. Major share of coconut production in India is contributed by millions of marginal farmers and about 10 million people are depending on coconut cultivation, processing and related activities. But the income from coconut alone is not sufficient for meeting total requirements of their families mainly because of the small size of holdings, declining productivity due to various reasons and unstable price of the commodity. Despite this, the farmers continue to grow coconut as it provides a regular income although it is currently marginal.

Research and development programmes in coconut have proved the potential for increasing income in poor coconut growing communities by promoting income-generating technologies. Swaminathan (2001) emphasized that the farm families need to have multiple

livelihood opportunities as they cannot get minimum income from just one source. He also envisioned that poverty can be addressed only if there is convergence and synergy between the various anti-poverty programmes and they are people-controlled, people-centred and people-driven.

Promoting diversity through different kinds of interventions in Coconut Based Farming Systems (CBFS) in a collective manner emerged as a global strat-

egy for sustaining the livelihoods of the marginal coconut growers. Based on this, a network project entitled 'Overcoming Poverty in Coconut-Growing Communities: Coconut Genetic Resources for Sustainable Livelihoods in India', supported by IFAD / COGENT/ Bioversity International was implemented by the Regional Station, Kayangulam, Kerala of the Central Plantation Crops Research Institute to develop income-generating models in strategically selected coconut-growing communities. The major objectives

of the project were to increase income from coconut gardens and to improve food and nutritional security of farm family members through a Coconut-Based Farming System (CBFS) model integrated with compatible intercrops, animal husbandry or mixed farming activities, diversification of products and conservation of genetic resources.



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Coir Spinning

METHODOLOGY

The project was implemented in three locations namely Pathiyoor, Devikulangara (Alappuzha Dist.) and Thodiyoor (Kollam Dist.) in Kerala during 2005-2008. In all the three project areas, Community Based Organizations (CBOs) were established with 75-100 active members. A total amount of Rs.4,11,500 was disbursed to these communities as microcredit, which was utilized mainly for intercropping, nursery establishment, livestock rearing, production of high value products, mushroom production and azolla cultivation.

The activities were carried out through registered CBOs based on the annual action plans prepared by the members. Major thrust was given for training/capacity building for the CBO members in developing their individual as well as group capacities in terms of technological interventions, arrangement of inputs and management of CBOs. The major interventions included intercropping cash, food and nutritional security crops, livestock integration, diversification of coconut products and conservation of genetic re-

sources.

The project assisted in the provision of planting materials and inputs through a micro credit scheme. Assistance was provided for sourcing machinery and equipment for processing. As part of conservation of genetic resources, awareness was created on the im-

portance of conserving their native varieties, organized diversity fairs and established community nurseries in all the three communities. Survey was conducted with farmers' participation in characterizing the local ecotypes. Farmer participatory market analysis was conducted for identifying the suitability of crops and high value products and based on which they have selected appropriate income generation activities for themselves. Profitability for the crops as well as products was worked out with farmer participation. Effective linkages were established with various agencies for technological support, input supply and micro credit facilities. The CBOs are also envisioned to eventually continue the activities that had been initiated by the project in partnership with them, sustain and hopefully expand the activities and benefits to the members and to other communities beyond the project duration.

Pre and post data related to demographic, socio-eco-

nomics as well as food security and nutrition aspects of the clients and income from coconut, intercrops, livestock and household level processing were recorded. Data was collected through personal interview with 150 CBO members and by referring the profitability records kept by the CBO members. The collected data was coded and analysed.

RESULTS AND DISCUSSION

The baseline survey revealed that the average size of the selected holdings were as low as 0.09 ha., with 81% of the CBO members having an area less than 0.12 hectare. The latest agricultural census (1990-91) showed that there were over 54.18 lakh holdings in Kerala of which nearly 84 percent were of less than half a hectare in size. The average number of coconut trees was only 17 and income from coconut was Rs.2800/- per homestead, which justifies the need for developing income generating models as envisaged in the project.

Capacity development efforts

The speciality of the capacity development efforts under the project was the inclusion of a number of programmes related to CBO management, microcredit



Homestead vegetable cultivation

Table 1. Details of capacity development programmes provided to CBOs

Sl.No.	Title of course	No. of batches	No. of beneficiaries		
			Male	Female	Total
1	Management of CBO	7	131	270	401
2	Micro credit management	3	14	13	27
3	Nursery management	4	27	6	33
4	Scientific coconut cultivation	1	17	8	25
5	Inter cropping including Vegetable cultivation	8	71	245	316
6	Bush jasmine cultivation	1	12	14	26
7	Fodder cultivation	1	6	62	68
8	Azolla cultivation	5	34	46	80
9	Mushroom cultivation	5	24	147	171
10	Goat / poultry rearing	2	21	13	34
11	Rabbit rearing	1	16	9	25
12	Cattle rearing/local feed formulations	2	4	24	28
13	High value products from coconut	5	11	218	229
14	Nutritive foods	2	57	65	122
15	Vermicomposting	4	40	38	78
16	Coir spinning	3	-	66	66
17	Packing and labelling for market promotion	3	9	23	32
	Total	57	494 (28%)	1267 (72%)	1761

management, public dealings and personality development, in addition to the technological trainings. A number of trainings after assessing the training needs were imparted on various aspects of intercropping, mixed farming, nursery production, vermicomposting and mushroom production (Table 1). Participatory demonstration on production of food products - both from coconut and intercrops - were also organized. The beneficiaries were trained in product diversification in such a way that no part of coconut was left as a waste. From coconut kernel, several food items like cookies, laddu, burfi and other sweets were prepared. Coconut milk, virgin oil and coconut candies were also made. Trainings on improved methods of livestock rearing and

ways of reducing cost of rearing through fodder production, local feed production and azolla cultivation were also arranged. Hands-on - experience was provided for techniques like azolla cultivation and vermicomposting.

Total number of 1761 participants were trained in various fields through 57 training programmes, of which 72% were women participants. Forty eight percent of the CBO members acquired special skills related to farming and 22% of them are utilizing it. The highest number of technology related trainings with higher participation were recorded for intercropping, production of high value products, mushroom cultivation and production of nutritive foods due to

which the highest improvement in adoption rate was observed (Table 2) for intercropping, followed by production of high value products.

Adoption of interventions

The capacity development efforts coupled with other support mechanisms could boost the adoption level of interventions. Almost all the members participated in one or more of the project interventions with or without availing micro credit. The pre and post adoption levels of various interventions are given in Table 2.

While considering all the members who utilized and not utilized micro credits, the adoption in general increased by 20% over the pre-project period. Increase in adoption was the highest in case of

Table 2. Status of adoption of interventions before and after the project

<i>Intervention</i>	<i>% of Adopters</i>	
	<i>Pre-project</i>	<i>Post-project</i>
Intercropping	66	95
Livestock rearing	26	44
High value products	0	26
Community nursery	0	5
Mean	23	43

intercropping (29%), followed by production of high value products (26%) and livestock rearing (18%).

In spite of the low adoption rate shown for community nursery, the most significant achievement of the project was the conservation of promising local ecotypes through these nurseries. Studies on the existing diversity level of coconut in three identified coconut communities revealed that 97.5 % of the population comprised of Tall ecotypes (Evoor Green Tall, Evoor Brown Tall, Evoor Brick Red Tall and Jappanan) and only 2.5 % accounted for Dwarfs (Green Dwarf and Orange Dwarf) and Hybrids. The farmers were trained on identification of varieties, selection of mother palms, seed nut collection and nursery management in-

cluding raising of polybag seedlings. The CBOs produced 1600 quality seedlings in the community nurseries for planting in the project areas.

Even though the farmers were found to adopt different interventions during the pre-project period to some extent, more intensive and scientific adoption could be achieved through the utilization of micro credits together with training outputs. The need to link training with microcredit is very much crucial in utilizing the acquired skills. Strengthening the capabilities of the poor through skills-enhancement with importance for the involvement of women is also an important factor in poverty reduction.

The particulars of microcredit utilization under the project for various interventions are

provided in Table 3.

Maximum micro credit was utilized for livestock rearing (53%) with the involvement of 40% of the members. This was followed by intercropping with 26% utilization of micro credit and involvement of 39% of the members. The overall involvement of women was found to be more in utilization of micro credit for various interventions included in the project.

PROJECT IMPACTS

The project impacts were studied soon after the conclusion of the project, which include both tangible and intangible outcomes. The improvements recorded in terms of various indicators representing socio-economic and food-security/nutrition status revealed significant impact of the project interventions. The intangible outputs like individual and group capacities indirectly promoted the delivery of tangible outcomes.

(i) TANGIBLE IMPACTS

Several indicators like income from coconut, intercrops, live-

Table 3. Level of participation, utilization percentage and women involvement in intervention – wise utilization of micro credit

<i>Intervention</i>	<i>No. of Participants</i>			<i>Level of participation (%)</i>	<i>Amount utilized (Rs.)</i>	<i>Percentage utilization to total</i>
	<i>Male</i>	<i>Female</i>	<i>Total</i>			
Intercropping	32	82	114	39	1,19,640	26
Livestock rearing	25	91	116	40	2,44,320	53
High value products	7	32	39	13	59,560	13
Community nursery	7	0	7	2	18,836	4
Others (Vermicompost, Azolla & Mushroom)	6	13	19	6	16,880	4
Total	77	218	295	100	4,59,236	100

(Amount utilized is inclusive of second time utilization of micro credits)

Table 4. Comparison of means of income from coconut, intercrop, livestock, off-farm and total income in Rupees (N = 150)

Source of Income	Mean Income	
	Pre -project	Post- project
Coconut	2780.40	4197.00 *
Intercrop	805.65	4287.20 **
Livestock	1842.80	10489.70 **
Off-farm	70.90	2749.65 **
Total Income	25617.25	59017.18 **
Herfindahl Index	0.70	0.57 **

Note: **Significant at the 0.05 level, ***Significant at the 0.01 level.

stock and household level processing and food and nutritional security status were measured before and after the project period to see the tangible impacts of the project (Table 4).

(a) Improvements in yield of coconut and area under intercrops

The average yield of coconut per palm per year increased from 30 to 37 over the project period, recording a 23% improvement. Even though the project had no component for managing the palms, the manuring and intercultural operations done for the intercrops coupled with the recycled organic matter from intercrops might have contributed for the slight increase in the yield of coconut. The area under intercrops also doubled during the period, which showed a shift from 3.25 cents during the pre-

project period to seven cents after the project.

(b) Improvements in income from various sources

Significant changes were recorded in the levels of income generated through various sources (Table 4).

The income from coconut recorded an increase of 50% over the project period. The project efforts could bring in tremendous increase in income from intercrops, livestock and household level processing and the total annual income per homestead enhanced from Rs.25,617 to Rs.59,017 over the project period. The major reasons can be attributed to the diverse interventions introduced coupled with the synergetic effect of community participation and nutrition education.

Since the project has most

likely changed the composition of total household income, there was need to examine the Herfindahl index, which is an index that indicates the economic diversity of a household. It is calculated as the sum of the squared shares of income from each activity (in this case coconut, intercrops, livestock, other on-farm, off-farm and non-farm). The index always takes a value between zero and one, whereby one represents complete specialization. The overall figures for the three localities showed a significant improvement in the diversification of their income.

Although the mean difference in income gives an indication of the change that occurred during the time of the project, it does not determine whether these changes have been caused by the project or whether external factors have caused this change. Hence, the influence of project on income was statistically worked out by second-stage regression with ordinary least square. Table 2 shows an overview of the regressions for the outcome indicators viz., intercrop, livestock, off-farm and total income.

In general, the project could make significant improvement in the income derived from intercrops and off-farm income. At Pathiyoor, the

Table 5. Summary of outcome indicators

Name of CBO	Significant influence of project by income category ¹				Food & Nutritional security
	Intercrop	Livestock	Off-farm	Total income	
Pathiyoor	**151.61	-	*94.45	**1993.75	+ 4
Thodiyoor	-	-	*136.02	**1719.80	+ 4
Devikulangara	**145.29	-	-	**1524.88	+ 4
Overall	**105.53	-	**71.09	**1561.71	+ 4

Note: ¹ These are the coefficients of the second stage regressions. Coefficient significant at * 0.05 level, **0.01 level.

project significantly influenced income from intercrops and off-farm activities, while the influence was on off-farm income at Thodiyoor and on intercrop income at Devikulangara. The project efforts in identifying suitable intercrops like vegetables, banana and tubers and off-farm activities for each of the CBOs were the major factors in achieving the success.

(c) Share of farm and non-farm income to total income

The share of income from farm related sources before and after the project (Table 5) revealed the potential for introducing various interventions related to coconut farming and allied enterprises. The share of income from coconut to total income was only 13% and together with all allied activities was 21%, whereas the share of non-farm sources was 79% before the project period. With the project efforts, the share from coconut-based farming systems including household value addition increased to 33%, recording a change of 12 per cent.

(d) Change in poverty status of the communities

Change in the poverty status of the communities is the most im-

Table 5. Share of different sources of income to the total income

Source of income	Share to total income (%)		% change
	Pre-Project	Post-Project	
Coconut	13	14	1
Intercrops	3	6	3
Livestock	5	10	5
Household level value addition	0	3	3
Total	21	33	12
Non-farm sources	79	67	-(12)

portant factor which decides the overall impact of the project. This was measured in terms of the number of holdings below poverty line in each of the communities before and after the project and presented in Table 6.

Significant change was recorded in the poverty status, in terms of the percentage of holdings below the poverty threshold level,

which reduced from 95 to 56%. The highest reduction in poverty incidence was recorded in Pathiyoor CBO (48%), followed by Devikulangara (36%) and Thodiyoor (34 per cent).

(e) Change in food and nutritional security status

Apart from the enhanced income levels, significant improvement was seen in the food and nutritional security of the family members, especially children. Regarding food security, there was an increase in the completely secure category from 67 to 96%, whereas, in the nutritional security, it was from 8 to 72% after the project. The totally insecure category was completely wiped off with project interventions.

Borrowing of money from neighbours was found to be practiced as the most important coping mechanism during the pre-project period (60%), which was reduced to 5% after the project. The improved rate of adoption of other coping mechanisms like backyard/homestead gardening (87%), livestock/fish/poultry rearing (64%)



Training for CBOs

Table 6. Comparison of Poverty Threshold level

Name of CBO	Holdings below poverty threshold level (%) (<1US\$ per head per day)		Percentage Change
	Pre-Project	Post-Project	
Pathiyoor	94	46	48
Thodiyoor	96	62	34
Devikulangara	96	60	36
Mean	95	56	39



Vegetable cultivation by youth

and food processing (85%) is a clear indication of the impact of project interventions on the socio-economic conditions and food and nutritional security of the CBO members, thereby supporting the data on poverty status.

(ii) INTANGIBLE IMPACTS

The important intangible impacts were:

- Improved social status and self-esteem of the members
- Economic and social empowerment of women
- Increased level of confidence in technology adoption
- Strengthened the individual and group capacities in terms of more knowledge, skills and social dealings
- Effective utilization of natural, human and social capital.

Factors influencing sustainability of the communities

The concurrent as well as post evaluations and observations revealed that in spite of getting a very good immediate impact, sev-

eral factors were found to play very important role in ensuring the sustainability of the communities. The following emerged as the important factors influencing the sustainability of the interventions / communities under this project:

Adequacy of food and income derived from coconut and allied interventions.

- Selection of interventions based on socio-cultural needs and demand in the local market.
- Assistance of implementing agencies / capacity of CBOs in input sourcing.
- Transparent and proper management of CBO and micro credit.
- Faith and confidence of the members towards the CBO activities.
- Regular meetings and collective action.
- Continued utilization of project outputs for trainings and technical demonstration.

CONCLUSION

Diversification of crops and coconut-based enterprises implemented through Community-based Organizations (CBOs) emerged as the most effective strategy for improving the quality of life of the marginal coconut farmers – both in

terms of income and food and nutritional security. The CBFS strategy adopted through a participatory community approach not only increased income but also promoted the conservation of coconut varieties, cash, food security and nutritional crops. The strategically adopted activities further helped to diversify and spread risk. Further, this strategy contributed to the strengthening of individual as well as group capacities, improvement in CBOs' ability to mobilize local resources and the social and economic empowerment of CBO members, especially women.

This model strategy can be replicated in all coconut growing areas to test on how local communities can achieve higher on-farm income and food and nutritional security through capacity building and adoption of different cost-effective interventions as per the comprehensive strategic plans. However, the sustainability can be ensured only if the CBOs attain the capacity to manage the funds, to source the inputs and select need-based interventions by themselves, which can provide adequate food and income to the members and their family.

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