
IMPACT OF TRANSFER OF TECHNOLOGY ON SMALL COCONUT HOLDINGS OF KERALA

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ABSTRACT

With a view to enhancing the socio-economic condition of the farm families in the villages of Kerala, two operational research projects on integrated land use and garden land management at Muttathody village in the northern zone and package of practices for the coconut root (wilt) affected disease area at Krishnapuram village in the southern zone of Kerala were started. Identified technologies were adopted and the developmental activities were extended to farmers in collaboration with different agencies. These activities included popularising agricultural and animal husbandry practices for different strata of farming community, integrated land use plan, timely supply of inputs, arranging agricultural credit, constructing community irrigation tanks and providing electrical energy to the village. The post-operational survey revealed that there was considerable increase in the nutrient consumption as well as yield of coconuts when compared to the pre-operational period. There was 49 per cent decline in the leaf rot disease. The yield of paddy has increased from 1.37 to 2.67 t per ha between 1974 and 1983. The adoption of intercropping and mixed cropping in coconut and arecanut gardens also increased considerably. The improved goat breeds Sannen and Malabari introduced into the operational area enhanced the milk production by three times. The production rate of fresh-water fish in the Krishnapuram village increased from 0-244 kg/ha during 1976 to 395-700 kg/ha during 1982-83. The total area under irrigation increased by 50 per cent. The number of pumpsets installed in the village increased from 95 to 388 during the project period. By arranging power supply to the Muttathody village 295 wells and 502 houses were electrified.

INTRODUCTION

A considerable yield gap exists between the yield level of farmers' plot and that of research farms. This so-called "extension gap" can be effectively narrowed down only through transfer of appropriate technology. An integrated programme in a viable operational unit for the testing, adoption and demonstration of the new technological developments was found to be necessary. Two

out-reach programmes, namely, Operations Research Project for Integrated Land Use Management in Muttathody village of Kasaragod district and Operational Research Project — adoption of Package of Practices for the root (wilt) affected area in Krishnapuram village of Kollam district were initiated by the Central Plantation Crops Research Institute.

Project Inputs

Departments of Agriculture, Animal Husbandry, Fisheries, SFDA, Irrigation, Community Development, Education, Cooperation and Health (Government of Kerala), Kerala State Electricity Board and financing agencies like Syndicate Bank and Land Mortgage Bank cooperated with CPCRI in implementing the programmes.

The village at Muttathody covers an area of 1,210 ha and falls in the northern midland agro-climatic zone of the state. The area has humid tropical climate and lies between 12° and 13° north latitude. Being closer to the sea and having good rainfall, the humidity is around 90 per cent. The mean annual maximum temperature is around 31°C and minimum 23°C. Maximum rainfall is received in July and the rainfall decreases steadily from August and tapers off in October. Rainfall is practically nil from December to March. The high rainfall concentrated within a short period, results in erosion of surface soil from slopes and water stagnation in low lying areas. The soil type is typical laterite.

Krishnapuram village in Kollam district in southern Kerala was selected for the project based on the intensity of root (wilt) disease. This village has an area of about 700 ha with predominantly sandy loam soil.

The first bench-mark survey was conducted in March 1974 in order to assess the overall economic condition of the Muttathody village at beginning of the O.R.P. There were 940 households with an average of 6.15 persons and 0.7 ha of cultivable land per household. The crops grown in Muttathody village were arecanut, coconut, jackfruit, tapioca, banana, cashewnut, etc. Paddy occupied 22 per cent of the cultivated area. Paddy was cultivated in about 40 per cent of the households which had an area of above 0.5 ha. To a large extent the terrain of the village is hilly and the irrigated area was about 37 per cent of the total cultivated area. Forty per cent of the households having about 0.25 ha were identified as the target group on which maximum effort was made although the objective was to cover all the households. The top 12 per cent of the households owned about 47 per cent of the cultivable land and 71 per cent of the irrigated land. About 90 per cent of the households grow coconut on their holdings. Irrigation to coconut was given by only half the households of top stratum owning more than 2 ha of land and also applied fertilisers for coconut.

The bench-mark survey which was conducted during 1975 in Krishnapuram village revealed that the village consisted of 2,023 households having 43 per cent minikit farmers (with less than 0.1 ha of land), 54 per cent marginal farmers (0.1 to 1.0 ha) and only 3 per cent of small farmers (more than 1.0 ha). The average holding size is 0.25 ha and 55 per cent of the families were

connected with agriculture either as cultivators or as agricultural labourers. The remaining 45 per cent families though having non-agricultural occupations had coconut palms in households. Coconut was the main crop grown in the village which was affected by the debilitating root (wilt) disease to the extent of 65 per cent. Leaf rot, bud rot, rhinoceros beetle attack, red palm weevil infestation, coreid bug, etc. were the other serious menaces to coconut in this village.

For Muttathody village farm plans were prepared for the families by the Scientists of the Institute. Initially planting materials were distributed free of cost to the identified target groups and at cost to others. Fertilisers amounting to 25.5 tons of N, 11.3 tons of P_2O_5 and 18.5 tons of K_2O were distributed. The Pyrites, Phosphates and Chemicals Limited, distributed 20 tons of rock phosphate free of cost as an incentive to all those who purchased N and K fertilisers. The SFDA gave grants and subsidies worth Rs. 76,500. A fertiliser godown was also constructed in the operational area. Assistance was provided to the villagers for digging wells and installing pumpsets. Two community irrigation tanks were also dug. During the project period 106 poultry units of 10 birds each were started. Eight milch buffaloes, 13 milch cows, 28 milch goats of improved breeds and three pairs of work bullocks were supplied. Three thousand two hundred and eighty fodder grass slips were also supplied. Eighty farm families were enrolled as members of the Poultry Cooperative Society of Kasaragod. Two Sannen cross-bucks for upgrading the local goat population and 11 Malabari goat kids were supplied. Calf feed subsidy was arranged through Dairy Development Department. Six hundred fingerlings of common carp were released in 21 tanks. As a part of the health programme a dispensary under the auspices of the Lions Club functioned in the area for three days every week till 1978. One nutrition garden was set up in Alampady area and 1200 papaya seedlings were distributed. Two applied nutrition project units were started.

About 80 per cent of the womenfolk in this village were unemployed at the time of initiation of the project. A self-employment programme of training in *beedi* making was conducted. Arrangements were made to provide loans to 442 beneficiaries for various purposes such as digging wells and tanks, purchase of pumpsets, milch cows, improving crop, constructing houses, purchasing of sewing machines and for poultry. A vigorous drive was organised for enrolling members to the cooperative society and the membership was raised from 193 to 746 in the ORP area. The Kerala State Electricity Board was approached for giving electricity connection for installing pumpsets and also for house connections. Through informal education, transfer of technology was extended to the schools. With the help of crop plants, specimens, models, charts and other teaching aids chemistry, botany, zoology etc. were taught in the schools with a bias to agriculture. A set of these teaching aids and books on agriculture and animal husbandry were also supplied to each school. In order to involve the students in agricultural operations, school gardens were also maintained. One of the village extension officers was given training in fish culture. Two training camps were organised in the village and 98 farmers were trained in

four batches. Training in plant protection was also given. Fifteen film shows on crop production techniques and animal husbandry were arranged for the benefit of the villagers. Twelve seminars on agricultural topics and cashew spraying were held. A farmers' meeting was organised under the auspices of AIR. A Mahila Samajam was started and members were given 100 laying hens, Malabari goats, vegetable seeds and plant protection equipment like hand sprayers.

In Krishnapuram village, under the rejuvenation programme 3,451 unproductive and root (wilt) affected palms were removed over a period of three years and replaced with quality seedlings. Coconut seedlings, pepper cuttings, clove seedlings, nutmeg, cocoa seedlings, green manure seeds, high yielding varieties of paddy seeds, etc. were supplied. Irrigation facilities were expanded by providing loans through Small Farmers Development Agency (SFDA) and other agencies. Twenty demonstration plots were laid out to popularise intercropping in coconut gardens with pulses (10), tubers (5) and betelvine (5). Thirty-five cross-bred cows, 82 goats, nine buffaloes, seven bullocks and 275 poultry birds were supplied to the farmers of this village. In the operational area shallow ponds were used for scientific fish culture. Carp fingerlings were distributed free of cost to 359 farmers and fresh water prawns to 26 farmers during 1980-81.

In this village the breeding places of rhinoceros beetle in 282 households were treated with BHC, 253 palms were treated against coreid bug and 342 palms against red palm weevil. Prophylactic spraying against leaf rot was given to 35,000 palms during four years, in addition to 771 palms treated for leaf rot. Three rat control campaigns were conducted using zinc phosphide and warferin.

During 1977 and 1979 Kisan Melas were organised and training on spraying, rat bait preparation and poisoning and coconut management were given to farmers. Vegetable gardens were maintained in five schools of the village. One agricultural seminar was organised during 1980 and two medical camps were also organised during the entire period of the project.

Project Impact

As a result of the adoption of scientific package of practices the fertiliser consumption increased by 263 per cent in the case of N, 212 per cent in the case of P_2O_5 and 205 per cent in the case of K_2O (Table 93.1) in Muttathody village. At the start of the project there were only 95 pumpsets and 250 wells which increased to 288 pumpsets and 785 wells during the project period. The irrigated area also increased by about 40 ha. Improving the availability of fertilisers and irrigation facilities in the operational area resulted in increased yields of many of the annual crops. The yield of coconut under the good management practices increased by 24.4 per cent in Muttathody village. The yield of paddy increased from 1.37 t/ha in 1974 to 2.67 t/ha in 1983. The adoption of intercropping and mixed cropping in coconut and arecanut gardens was also increased. Only 20.2 and 28.3 per cent of the coconut and arecanut farmers respectively were practising intercropping in 1974 which

increased to 26.1 and 34.4 per cent respectively in 1983. The improved goat breeds of Sannen and Malabari introduced into the operational area increased the milk production on an average from 0.5 to 1.5 l. Industrial ventures such as bread making and sandalwood oil industry, intercropping and mixed cropping contributed to the increased employment opportunities and the number of earning members increased by 0.39 per household. The number of farmers practising plant protection increased to 33 per cent from 5 per cent in 1974.

Table 93.1: Nutrient consumption in Muttathody village (in kg)

<i>Nutrient</i>	<i>1974</i>	<i>1983</i>	<i>Per cent increase</i>
N	1972	7168	263
P ₂ O ₅	879	2743	212
K ₂ O	1588	4842	205

In Muttathody village 295 wells and 502 houses were electrified during the project period. The membership of the cooperative society which was only 579 at the time of initiation of the project increased to 1,868 in 1983.

In Krishnapuram village, a root (wilt) affected area, 14 per cent increase in coconut yield and 49 per cent decrease in the leaf rot disease was achieved. The fertiliser intake increased from 12.5 t to 40 t in 1982. The production rate of fresh-water fish in Krishnapuram village increased from 0-244 kg/ha during 1976 to 395 to 700 kg/ha during 1983.

Constraints

The Operational Research Programme has contributed much to the overall improvement of the Muttathody and Krishnapuram villages. However several constraints were identified in the course of implementing these programmes. Most of the land in Muttathody village was undulating and due to the erosion of top soil it was difficult to grow crops profitably. Most of the families did only part time farming as the income from agriculture alone was not sufficient for their livelihood. Absentee landlordism, lack of irrigation facilities, irregular spacing, high cost of labour, very small holding size, lack of cooperative ventures etc. were other constraints. For getting returns from crops like coconut, areca-nut and cashew the farmers had to wait for a long time which in most of the cases discouraged the farmers to depend solely on agriculture.

DISCUSSION

E.G. Silas: Was a bench-mark survey made for the two Operational Research Products? Did the impact survey show economic returns for the families involved despite higher costs in inputs?

M.K. Muliya: Yes. Root (wilt) management in Krishnapuram (coconut) and spraying endosulfan against tea mosquito (cashew) showed economic returns.