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National Agricultural Innovation Project Kerala Agricultural University

“Multi Enterprise Farming Models to Address the
Agrarian Crisis of Wayanad District of Kerala”

Progress Report

(as on 31-3-2012)



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PREFACE

Wayanad District of Kerala State is identified as one of the 150 backward districts listed by the Planning Commission of Government of India. About 17% of the population of the district are tribes. The Regional Agricultural Research Station, Ambalavayal of the University in association with the Indian Institute of Spices Research, Calicut, Vegetable and Fruit Promotion Council, Keralam, Wayanad Social Service Society, Marianthavady, Regional Coffee Research Station, Chundale and District Panchayath is implementing a World Bank funded scheme "Multi Enterprise Farming Models to Address the Agrarian Crisis of Wayanad District of Kerala" in a consortium mode in selected nine Panchayaths of the District in three Taluks from 2008 – 09.

The project is unique in its mode of implementation covering multiple interventions in a consortium mode. The Progress Report 2011-12 includes the progress and highlights achievements of the Project during the previous year. As the project is in the midway, attempt has been made to compile all cumulative achievements also as a mid term report. The major initiatives and achievements of NAIP during the previous years are productivity and profitability enhancement through optimal use of resources and technologies including organic farming and Women and Tribal Empowerment Programmes.

I place on record our sincere thanks to Dr. Bangali Baboo, National Director, and Dr. A.P. Srivastava, National Coordinator (Component-3) of NAIP from the ICAR for their support and guidance. We are fortunate to have the guidance of the Consortium Advisory Committee led by Dr. R. Vikraman Nair, whose advice kept the consortium heading in the right direction. I wish to appreciate all Consortium Partners, all Co.PIs, staff of NAIP and RARS, Ambalavayal, for making the project a great success and hope that this rhythm will be maintained in future also.

(T.R.Gopalakrishnan)

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Multi Enterprise

Farming Models to Address the Agrarian Crisis of Wayanad District of Kerala

I. Introduction

Wayanad district which lies in the north eastern part of Kerala State is one among the most underdeveloped regions in India. The District lies between northern latitude $11^{\circ} 27'$ and $15^{\circ} 58'$ and east longitude $75^{\circ} 47'$ and $70^{\circ} 27'$. This is the only district of Kerala, categorized as backward by the Planning Commission of India. The social fabric of the district is distinctly different from the rest of Kerala, with the highest proportion of tribes, low sex ratio and environmentally most fragile ecosystem (the highest proportion of geographical area under forests/high gradient). The district has a purely agricultural dependant economy with no industry to boast of. The total geographical area and population of Wayanad district are 2, 12,560 ha and 7, 80,619 respectively, which account for 5.48 per cent and 2.31 per cent of Kerala. Tribes form 17.4 per cent of the total population of the district.

NARP sub project on "Multi Enterprise Farming Models to Address the Agrarian Crisis of Wayanad District of Kerala" was proposed to enhance the rural livelihood of the Wayanad farmers in a sustainable manner implementing the concept of multilayered farming based on a cluster approach. The project is implemented in three clusters in the district (figure 1). The selection of the cluster was made, based on the backwardness of the area, which is decided based on per capita agriculture

... tribal population and literacy rate. The most backward villages were selected. The project applies the concept of achieving sustainable rural livelihoods through economically viable, ecologically safe and socially acceptable technologies. The project is implemented in a consortium mode with Kerala Agricultural University (KAU) as the lead centre and five partners.

II. Objectives

The objectives of the project are:

1. Productivity enhancement through optimal use of resources and technologies including organic farming.
2. Women and tribal empowerment through agri based self employment programmes.
3. Developing a viable system for procurement and marketing of agricultural produce with or without value addition.
4. Conservation and management of soil and water resources to mitigate drought and other natural calamities.
5. Capacity building for human resources development.

III. Consortium Partners

- a. Indian Institute of Spices Research (IISR), Kozhikode, Kerala.
- b. Regional Coffee Research Station, (RCRS), Coffee Board, Chundale, Wayanad District.
- c. Vegetable and Fruit Promotion Council Keralam (VFPCCK), Kakkanad, Ernakulam District, Kerala.
- d. District Panchayath, Kalpetta, Wayanad District, Kerala.

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- e. Wayanad Social Service Society (WSSS), Mananthavady, Wayanad District, Kerala.

IV. Social Status (Pre-project)

The value of Gender Development Index and Human Development Index for Wayanad is occupying the 12th and 13th position among 14 districts in Kerala. Social Status of the District, as indicated in the base line survey showed that the average family size is 3.27 and majority of members have crossed the age of 60. One third of the population fully depends on agriculture for livelihood. All the respondents could read and write and people are formally educated. The asset possessions in households, communication facilities and the exposure to mass media are fairly good.

The cropping pattern in Wayanad has been mainly coffee and pepper based. Owing to economic and environmental changes, it is getting transformed slowly in favour of crops like rubber and coconut. The area under rice has shown a decline, eroding the diversity base of traditional, medicinal / scented rice varieties endemic to Wayanad. Commercial banana cultivation is a profitable enterprise in this area. Currently vegetables, medicinal plants and floriculture are also gaining importance in the cropping pattern.

The total annual household income in the project area was estimated as Rs.34643/- at the beginning of the project, 52% of it being realized from agricultural enterprises. The average household income from subsidiary sources amounted to Rs.16534/- in the project area and Rs.13148/- in the control area.

The farmers do not generally adopt value addition practices at farm level and sell their produce in nearby markets or through pre harvest contractors. But pepper and coffee is retained by large farmers (26%), for future sale when prices are better. Livestock rearing is confined to only 52% of respondents. Generally, dairying (cow), goat and poultry are practiced. The dairy enterprise is not found remunerative, if all costs are taken in to consideration. The net income at paid out cost level is only Rs.3370/- per animal per annum. In goat farming it is Rs.3445/-. However, owing to house hold nutritional advantages and resource cycling prospects, farmers maintain these enterprises. Poultry farming is of backyard rearing in nature and is managed by women folks. Fisheries enterprise is not yet a popular activity.

Though mass media is a major source of general information most of the farm level decisions are based on the advice by fellow farmers. Only 8% of farmers in the project area are exposed to scientific training in agriculture and allied sectors and 63% have expressed their willingness and interest in the programme. 19% of the farmers have expressed their interest in fishery enterprise.

Most often farmers depend on market for all major inputs in crop production. Only 4% of seed requirements are met from own sources. The HYV coverage among sample households is low (37%). Poor extension machinery, non-availability and absence of collective action are reported as the major reasons for this.

More than 62% of surveyed holdings are indebted and the major dependence is on non-institutional sources. 38% reported prompt

repayment and 42% claimed that there is no diversion of loan amount. Despite high degree of risk in agriculture sector, only 6% have protection under the crop insurance scheme.

Many of the problems in agriculture sector are related to the supply of quality inputs, crop management and extension support. They requested to make arrangements for quality inputs at affordable rates (63%), and cost effective technologies to address the problems associated with pest / disease / weed menace. Scientific water management programmes and water conservation efforts are also required. Nearly half of the respondents suggested improved extension arrangements.

V. Major Interventions undertaken in NAIP

i) Productivity and profitability enhancement through optimal use of resources and technologies including organic farming.

Restoring paddy Cultivation, Mechanization in paddy, Bio control agents and organic fertilizers, Establishment of multilayered and mixed farming models and Popularising organic farming and certifications are the various activities undertaken.

a) Restoring paddy Cultivation

Major reasons for low productivity in paddy under Wayanad conditions are high acidity of soil and imbalance in fertilizer application. In order to collect information regarding the soil health of the area, samples were collected from 12 *padasekharams* (group of paddy farms) of the study area and analyzed for chemical and physical properties like pH, TSS, Nitrogen, Phosphorous, and Potassium. Based on the soil test results scientific nutrient management measures were introduced, which include proper lime application and use of straight fertilizers instead of acid

supplied high yielding varieties of Chana, Jyothi & Deepthi. The variety Chana was found to be suitable for Wayanad conditions. During the project period, the cluster area field was covered with various interventions. As a result of the above interventions undertaken by KAU, the area under paddy in the cluster area has been increased in the tune of 12.21% and productivity to 20.46% (table. 1).

Table No. 1. Increase in Area and Productivity of Rice in the Project Area

No	Name of Farm Groups & Panchayaths	Area in Nancha season (ha)		Productivity in Nancha season (tons/ha.)	
		Baseline (2008)	Midterm (2011)	Baseline (2008)	Midterm (2011)
1	Karivalam, Ambalavayal	11.00	12.00	4.00	4.93
2	Ambukuthi, Nenmeni	83.33	90.00	2.75	3.35
3	Manjalankaitha Meenagadi	18.96	24.80	3.50	4.23
4	Palliyara Kaniyampatta	98.44	112.00	3.80	4.52
5	Madakkunnu Koitathara	34.00	36.00	3.57	4.36
6	Moothimoola & Malakkad Muttal	54.72	57.60	3.75	4.02
7	Ayirikkal Thayimal	14.80	16.20	3.30	4.08
8	Mundom Thondemadu	13.20	17.60	2.90	3.61
9	Kandathuvayal Vellamunda	6.80	10.00	3.25	3.95
	Total area	335.25	376.20		
	Per cent increase	12.21		20.47	

b) Mechanization in Paddy

Shortage of labourers and high wage rates coupled with low productivity adversely affected the paddy cultivation of the district. A total of 40 farm labourers selected from the project area were given training to operate and maintain the machineries. In order to reduce the cost of cultivation, mechanization was promoted. A self help group (SHG) namely "*Kisan Haritha Sangham*" was formed including 12 trained farmers and equipped them with the machineries like Paddy reaper, thresher, Winnowing, cono weeder, knapsack sprayer, weed cutter and coconut climber. This SHG is now providing services for land preparation, planting & harvesting of paddy and other activities using the machineries provided to them. This intervention helped the farmers of the project area to save 40 - 50% labour charges for various agricultural operations. Further, the members of the SHG are also benefited by way of employment. Thus popularization of farm mechanization enhanced the dignity, profitability and status of agriculture workers.

c) Bio Control Agents and Organic fertilizers

Indiscriminate use of large quantities of pesticides and chemical inputs has degraded the soil and ecosystem. Safe agricultural practices were promoted under the project. For reducing the impact of hazardous pesticides and conservation of beneficial organisms, bio control agents like *Pseudomonas*, *Trichoderma*, *Beauveria*, *Verticillium*, *Trichocards*, Pheromone traps etc were introduced in the project area. Awareness programmes and on farm trials were also conducted.

Both Trichocards and Pheromone traps were installed as a preventive measure in the paddy fields where the attack of stem borer and leaf roller is common. During a crop season, Trichocards were installed three times at an interval of two weeks. In the case of Pheromone traps one trap is enough for one season. For an area of one hectare 5 c.c. Trichocards and 20 Numbers of Pheromone traps were used. The measures were carried out in 120 ha of paddy fields coming under different farm groups of the project area. Trichocards and Pheromone traps were found effective against leaf roller and stem borer.

Pseudomonas is also applied in rice during seed soaking and transplanting. During the project period pseudomonas was applied in the entire project area covering 822 ha of land and found effective for controlling various fungal diseases.

Beauveria and Verticillium are also introduced to control berry borer in coffee and other sucking pests like mealy bugs and scale insects in pepper. During 2011 the control measures were carried out in an area of 120 ha of home gardens. Beauveria is found effective where as the effect of verticillium is to be further confirmed.

d) Establishment of multilayered and mixed farming models

Main reasons for the low productivity of the commercial crops of the district are unproductive and senile plantations, local varieties, incidence of pest and diseases, natural calamities, changes in climate, etc. An integrated approach was adopted to address the above issues in

a mixed farming model. Commercial activities like production of organic inputs and bio control agents, marketing, value addition, etc. were promoted by KAU through well trained self – help groups which acted as a remedy for unemployment.

In order to rejuvenate the existing multi layered farming systems, seedlings of coffee and pepper were distributed as the major crops. Seedlings of various plantation crops, spices, fruit plants, forest trees, etc. were also introduced. More than 85% of the seedlings are established and will start to generate income in the coming 3–4 years. This intervention helped to improve the agro biodiversity of the area in a great extent. Since the intervention is in perennial crops it is too early to assess the impact at this stage.

Back yard poultry, goat rearing, biogas and vermi compost units were also introduced and promoted cattle rearing to improve the system to an integrated farming model.

e) Popularising Organic farming and Certification.

WSSS organized awareness programmes and equipped about 705 farmers to get their farm certification under organic certification programme by M/s LACON International. They are already practicing organic farming. Under the project totally 185 farmers won organic certification. 520 farmers are also in the transition stage. Focus is on coffee and pepper. Agricultural produce are procured by the society at a premium price. An area of 560 ha has been transformed to certified organic cultivation. A total of 1335 tons of organic agricultural produces are procured and marketed during

of ginger, 8.6 tons of green pepper, 15.5 tons of coffee (table. 3) and 6.3 tons of turmeric. The yield increased by 150%, 25%, 40%, 30% and 30% respectively.

In connection with the scheme 20 vermicompost units were established with a capacity of 27 tons of vermicompost and 100 liters of vermivash per year. Six Varanasi compost units are established which in turn produce 30 tons of compost per year. 20 biogas units are also established each is having the capacity to meet the demand for a five member family.

Table No. 2. Comparative Statement of Returns from Pepper

Panchayath	Procurement in Tons				Price in Lakhs			
	Baseline (2008)		Midterm (2011)		Baseline (2008)		Midterm (2011)	
	Conventional	Organic	Conventional	Organic	Conventional	Organic	Conventional	Organic
Thondemadu	16.54	Nil	Nil	16.83	21.17	Nil	36.01	47.97
Vellamunda	30.52	Nil	Nil	30.87	39.06	Nil	65.75	87.98
Thavinjal	5.74	Nil	Nil	5.85	7.34	Nil	12.46	20.92
Total	52.8	Nil	Nil	53.05	67.57		114.22	156.87

Table No. 3. Comparative Statement of Returns from Coffee

Panchayath	Procurement in Tons				Price in Lakhs			
	Baseline (2008)		Midterm (2011)		Baseline (2008)		Midterm (2011)	
	Conventional	Organic	Conventional	Organic	Conventional	Organic	Conventional	Organic
Thondemadu	37.49	Nil	Nil	36.54	15.74	Nil	22.65	23.75
Vellamunda	71.18	Nil	Nil	72.87	29.89	Nil	45.18	47.36
Thavinjal	14.20	Nil	Nil	15.05	5.96	Nil	3.69	3.87
Total	122.87	Nil	Nil	124.49	51.59		71.52	74.98

ii. Women and Tribal Empowerment through agri-based self employment Programmes.

Establishment of Poultry, goat and pig rearing units, Nursery and Vegetable seed production, Vegetable and fruit processing, Medicinal plant cultivation in homesteads etc. are the various women and Tribal Empowerment Programmes implemented in the project area. Details are furnished below.

a). Establishment of backyard poultry and goat units

Aiming the improvement of livelihood security of the women of the project area, 533 backyard poultry units and 60 goat rearing units were established in the project area. Six layer birds of *Gramapriya* breed were distributed to each household. The activity is implemented among marginal farmers with land holding size less than 0.1 ha. The average yield of eggs was 170/bird per year. The additional annual household income from a unit of backyard poultry was of Rs. 3528 during the first year (table. 4). Sixty backyard goat rearing units were established in different localities of the three clusters. Actual spread of the component is ensured by incorporating the condition that one kid will be returned to the farming group within a period of two years.

Table No. 4. Average income and expenditure of backyard poultry units during first year

Sr	Name of Poultry Unit	Total income Rs	Maintenance cost Rs	Total income Rs	Maintenance cost Rs	Profit Rs
1	Ambalavayal	3584	300	3884	150	3734
2	Meenangadi	3544	250	3794	200	3594
3	Nenement	3648	350	3998	250	3748
4	Kamampatta	3136	275	3411	150	3261
5	Kottathara	3728	300	4028	100	3928
6	Muttill	3408	250	3658	150	3508
7	Thavinjal	2904	250	3154	90	3064
8	Thondernad	3456	275	3731	150	3581
9	Vellamunda	3264	300	3564	230	3334
	Average	3408	283	3691	163	3528

b) Backyard Piggery

Nine Piggery units have been established in the project area under two clusters. A pair of breeding stock (White Yorkshire) was provided to each unit. As per demand more than one unit were allotted to each farmers. Average profit for unit per annum was Rs. 44,799/- (table. 5). The availability of cheap source of feed like hotel waste, waste from chicken and vegetable shops is the backbone of success. The farmers sold the piglets to the nearby farmers to establish new units which in turn helped to the horizontal spreading of the practice.

Table No. 5. Average Annual Income from Pig Rearing Units

Name and address of farmer	No. of pigs supplied	No. of piglets produced	Unit Price Rs.	Income from sale of piglets Rs.	Income from manure Rs.	Total Income Rs.	Maintenance Cost Rs.	Profit Rs.
Vaghese P V, Puthukudissery Kakkavayal	4	8 (5)	5000	25000	11682	36682	14602	22080
Bhaskaran T K Thottamkolly Kakkavayal	6	18 (13)	5000	65000	26284	91284	32854	58430
Sreedaran Mandamkolly Kakkavayal	4	17 (12)	5000	60000	24824	84824	31029	53795
Sivan Pakkunnel Kakkavayal	4	14 (10)	5000	50000	20444	70444	25554	44890
Average		12 (10)		50000	20809	70809	26010	44799

Note: Value in the parenthesis shows the number of piglets survived

c) Goat, poultry, and duck rearing units on SHG mode

Goat rearing in SHG mode was introduced as a innovative model. SHGs were provided with 10 goats (9 female and 1 male) and the economics of this activity is depicted in table 6. A total of 12 units were established under three clusters of the project area. The animals were supplied to the SHGs under an agreement that they have to return at least five young ones free of cost to the Sustainable Fund Committee within a period of 18 months, which will be supplied to the new beneficiaries. Ten out of 12 units have returned the young ones and these are distributed to new beneficiaries. Even though the initial (first year) profit is found

...unprofitable in the long run. The net income in the first year was Rs. 22,095/- per unit. This activity is found suitable in the tribal hamlets. Another reason for failure of this activity is less due to internal conflicts.

Table No.6 Average annual income from goat rearing units

Name of the SHG	No. of kids produced	Unit Price Rs	Income from kids Rs	Income from Milk Rs	Income from Manure Rs	Prod Cost Rs	Total income Rs	Profit Rs
Sneha	16	3125	50000	3240	7018	29210	60258	31048
Anaswara	12	3000	36000	2160	5266	21910	43426	21516
Pratheeksha	8	3000	24000	1440	3514	14610	28954	14344
Prathibha	14	3250	45500	2520	6142	25560	54162	28602
Soumya	9	3125	28125	1440	3952	16435	33517	17082
Haritha	15	2750	41250	2520	6580	27385	50350	22965
Gramashree-131	18	2500	45000	3240	7894	32860	56134	23274
Gramashree-277	10	3000	30000	1800	4390	18260	36190	17930
Average	13	2969	37484	2295	5595	23279	45374	22095

Ten poultry rearing units were established on SHG mode under three clusters. Each unit is supplied with 200 birds after completing the cage construction at their own cost. Feed and mineral mixtures were also supplied to the unit, until the birds started laying eggs. Evaluation indicated that this is not a viable activity. If the unit is expanded with more number of birds there is a chance for success. Duck rearing is also not found as a viable practice. High recurring cost particularly cost of feed, low initial returns and internal conflicts among the members are the major reasons for failure.



Figure-1. Location and project sites



Planting pepper seedling



Planting pepper seedling



Planting pepper seedling



Planting pepper seedling



Planting pepper seedling



Planting pepper seedling



Planting pepper seedling



Distributing fertilizer as pepper standard



Dr. S. S. Srinivasan presenting a certificate to Mr. S. S. Srinivasan



Seedling distribution for multi layered taro and system



Dr. S. S. Srinivasan presenting a certificate to Mr. S. S. Srinivasan



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Storage of vegetable and fruit products

Storage of vegetable and fruit products

d) Tribal empowerment

Tribal empowerment programmes are implemented in five tribal hamlets of two different localities namely Niravilpuzha and Thirunelly. Both the localities come under Manathavady cluster.

Pannippad, Paliyottil, Manappat and Mattilayam are the hamlets coming under Niravilpuzha area. Tribes of the area face the problems of malnutrition. As an initial attempt various training and awareness programmes were conducted regarding the role of fruits, vegetables and tubers in the health and nutritional security. Homestead cultivation of vegetables (summer and cool season vegetables) and fruits were initiated. This intervention was found successful to meet the daily requirement of vegetables to improve the nutritional status of the community. It also fetches an additional income by selling the surplus produce. 54 species of various plants viz. fruit, leafy vegetables, tuber crops, plantation crops, spices and medicinal plants were established as a part of this intervention in every tribal homestead.

e) Women empowerment through nursery and vegetable seed production

Nursery and vegetable seed production in SHG mode with the technical assistance of Regional Agricultural Research Station (KARI) was found viable. The SHG consists of 24 women members of age group of 30 to 50 years. The total annual earning from the nursery and vegetable seed production activity came to Rs. 7.74 lakhs, which provided an additional average annual income of Rs. 36,210/- per household.

f) Women empowerment through vegetable and fruit processing

A unit for processing of fruits, vegetables and spices were established under the project to impart hands on training on processing. An SHG is now running the unit. Raw agricultural produce available in the RARS farm including jack fruit, mango, mangosteen, vegetables and spices are converted to value added products. During 2011-12 turnover was 2317.kg. Products costs Rs.1.40 lakh.

g) Medicinal plants cultivation in tribal settlements

Tribes in Wayanad depend on medicinal plants of natural habitats of forests. Usually medicinal plants used for ethnic herbal formulations are collected from near by forest land in an unsystematic, unorganized and unscientific manner. The indiscriminate and destructive collection practices reduce the availability of medicinal plants and this is considered as a serious threat to bio diversity of the forest eco system. Participatory action was initiated to ensure conservation of endemic and threatened medicinal plants used by the tribal folks in a sustainable manner. 32 species of medicinal plants were supplied to 91 tribal families for cultivation in their homesteads and in nearby forest area. Forest department was also associated in the programme. An area of 8 ha in the Begur forest range was utilized for the programme.

iii. Developing a viable system for procurement and marketing of agricultural produce with or without value addition

a) GI registration for scented rice varieties of Wayanad

Wayanad Jeerakasala Rice is a popular traditional aromatic rice cultivar of Wayanad District. This scented, non-basmati rice is famous for its characteristic aroma. Grains are of medium size and shape (slightly elongated), with golden yellow colour and partial short awns. Wayanad Jeerakasala rice differs from Basmati rice in growth habit, areas of original cultivation, physico-chemical properties of grains and grain shape. The pleasant flavour and aroma of Wayanad Jeerakasala rice fetches a premium price in the market.

Wayanad Gandhakasala Rice is another popular traditional aromatic rice cultivar. NAIP, took lead to get Geographical Indication registration for the Wayanadan Scented Rice Varieties Jeerakasala and Gandhakasala in association with Wayanad Nellulpadaka Sahakarana Sangham. The Sangham is now taking up activities to produce market for the GI registered products. Participated in Exhibitions/sale organized at Tranakulam by IPR Cell, Chennai and Santhigiri Expo, Trivandrum.

b) Marketing of organic spice products

With the interventions of consortium partner, WSSS organically produced spices are being exported under a brand name "Wayanad Classics". 30 tons of organic ginger and 3.7 tons of organic turmeric were processed and exported, providing 20 - 33% premium price to farmers.

Export of 500000 kg (more) to farmers. 38% a premium price of 30% for

provided a premium price (40% coffee was procured from farmers at

c) Farmers Owned Markets

Consortium partner VFPK made successful intervention in marketing of agricultural products through farmer - owned markets. 17 collection points and one retail outlet have been established in the project area for the collection and marketing of farm produce. These are being managed by 15 farmers. Transportation facilities and other infrastructure for the farmers owned markets were provided under the NAIP Scheme. About 5453 tons agricultural produces worth Rs. 7.34 crores were traded through these. 95 tons jack fruit (average rate 5/kg) were also traded.

iv. Conservation and management of soil and water resources to mitigate drought and other natural calamities

a) Renovation of public ponds and strengthening of water harvesting and storage structures

One check dam was renovated to bring an additional 17 acres under paddy cultivation in Mo nagadi Panchayat. Renovation of one public pond (Kaniyampetia), one public well was renovated and connected with a roof water harvesting system (in Nenmeni panchayath) for recharging. This provides both drinking and irrigation facility to 50 families.

b) Waste management programmes for biogas and organic manure production

With an aim to provide an eco-friendly solution to utilize the kitchen waste, and other agricultural wastes, 20 biogas units (1 m³), 28 units of Thumboormuzhi compost (1 m³), and 20 vermi-compost units (1500 kg/ year) have been established. 1800 mini vermi-compost units for kitchen waste management were also introduced to the beneficiaries in the project area.

v. Capacity building for human resources development

Stipendiary training programmes on capacity building like farm mechanization (1 month duration), value addition and processing technology (6 months), nursery management and vegetable seed production (6 months), ornamental fisheries (2 weeks), tissue culture (2 weeks) etc. were conducted. In addition to this, 97 one - day training programmes were also organized to beneficiaries on various skills related to agriculture and animal husbandry.

VI. Technical Details of Activities Performed

Objective	Activity
<p>Productivity and profitability enhancement through optimal use of resources and technologies including organic farming</p>	<p>1. Restoring the paddy cultivation</p> <p><u>Inputs distributed</u></p> <p>Paddy seeds - 65,770 kg (Athira, Kanchana, Uma & Jyothi)</p> <p>Lime - 372,560 kg</p> <p>Fertilizers - 156,840 kg</p> <p>Pulse seeds - 2,530 kg (4 varieties)</p> <p>2. Popularising mechanization in paddy field</p> <p>Established one SHG for paddy mechanization and provided machineries and equipments for effective functioning.</p> <p>3. Popularising Bio control measures & organic fertilizers.</p> <p><u>Inputs distributed</u></p> <p>Pseudomonas - 1,773 kg</p> <p>Trichoderma - 829 kg</p> <p>Pheromone traps - 237 nos</p> <p>Trichocards - 1,800 nos</p> <p>Beauveria - 790 kg</p>

Verticillium – 337 kg

Pseudomonas enriched vermi compost - 2000 kg

Trichoderma enriched vermi compost - 2000 kg

Pseudomonas enriched cowdung - 200 kg

Goat manure – 20,750 kg

4. Establishment of different models of multilayered and mixed farming systems

Inputs distributed

Pepper cuttings – 202,490 nos

Standards for pepper – 9,192 nos

Introducing new varieties of ginger – 2,074 kg

TC Banana – 7,000 nos

Pl. crops & spices – 58,289 nos

Forest trees – 3,901 nos

Fruit plants – 27,155 nos

5. Popularising HYV of tuber crops

Inputs distributed

Tapioca – 2,600 cuttings

Colocasia tubers – 6,500 kg

Coleus – 42,000 cuttings

Dioscorea – 150 kg

6. Popularising scientific feeding practices on livestock based production system

	<p>Inputs distributed</p> <p>Mineral mixture for heifers – 525 kg</p> <p>Pelleted cattle feed – 26,250 kg</p> <p>Poultry feeds for SHGs – 6,050 kg</p> <p>Improved cattle nutrition : Yellow maize – 20,000 kg</p> <p>7. Popularising organic farming and certification</p> <p>Organic certified farmers – 185</p> <p>Farmers awaiting for certification - 520</p> <p>Farmers practicing organic farming – 705</p> <p>Villages converting to organic – 26</p> <p>Area of land under organic farming - 560 ha</p>
<p>Women and tribal empowerment through agri based self employment programmes</p>	<p>1. Establishment of backyard poultry, piggery and goat units</p> <ul style="list-style-type: none"> • 533 poultry units @ 6 birds / beneficiaries • 60 backyard goat rearing units • Nine piggery units (18 piglets) <p>2. Formation of women SHGs for poultry, duck & goat rearing</p> <ul style="list-style-type: none"> • 12 goat rearing units (10 animals per unit) • 10 poultry rearing units (200 birds per unit) • Two duck rearing units (100 birds per unit)

3. Established backyard nutritional vegetable garden

3065 summer vegetable gardens 2560 cool season vegetable gardens

4. Formation of women SHGs for vegetable seed and nursery production, vegetable and fruit processing etc.

Five SHGs for nursery and vegetable production (40 members) - One SHG for vegetable and fruit processing (Seven members)

5. Tribal empowerment

- Planting of medicinal plants in natural forest in collaboration with forest department at Thirunelveli, Mananthavady - 8 ha of forest land is planted with 57 species of endangered medicinal plants
- Established a model medicinal plant garden in collaboration with forest department at Thirunelveli, Mananthavady - 2 acre of forest land is converted into a medicinal plant garden (65 species)
- Popularization of medicinal plant cultivation in tribal home gardens 32 species of medicinal plants were supplied and planted in 91 tribal families under two SHGs

	<p>to improve the nutritional status of the population. The project introduced plants, leafy vegetables, summer vegetables and two varieties tuber crops introduced and planted in home gardens of tribal families</p> <ul style="list-style-type: none"> • Training and awareness programmes regarding the importance of vegetables, fruits and tubers in the health and nutritional status.
<p>Developing a viable system for procurement and marketing of agricultural produce with or without value addition</p>	<ul style="list-style-type: none"> • GI registration of scented rice varieties of Wayanad Completed GI registration of <i>Wayanad Jeerakasala</i> and <i>Wayanad Gandhikasala</i> in association with <i>Wayanad Nellupadaka Sahakarama Sangham</i> • Started exporting organic spices Developed a Brand Name "Wayanad Classics" • Established 15 farmer owned collection centers and one retail market to assure reasonable price to the produce of farmers. Traded 3,742 tons agricultural produces costing Rs. 4.76 crores, and 95 tons jack fruits @ average rate 5/kg. • Collection and marketing of organic products Collected 30 tons of Organic ginger and 3.7 tons of Organic turmeric, processed and exported and

	<p>provided 20- 33% premium price to farmers - Collected and exported 8 tons of green pepper from farmers and provided 40% of premium price to farmers - Collected and exported 38 tons of coffee from farmers and provided 30% premium price to farmers</p>
<p>Conservation and management of soil and water resources to mitigate drought and other natural calamities</p>	<p>Renovation of public ponds and strengthening of water harvesting and storage structures</p> <ul style="list-style-type: none"> • Renovated a check dam which brings an additional 17 acres of land under paddy cultivation. • Renovated a public pond which provides both drinking and irrigation facility to 28 families. • Constructed a new roof water harvesting structure benefited by 18 families. <p>Waste management programmes for biogas and organic manure production</p> <p>Biogas units - 20</p> <p>Thumboormuzhu compost units - 28</p> <p>Vermi compost units - 20</p> <p>Mini vermi compost units for kitchen waste management - 1800</p>

	Business Programmes and Exhibitions
Capacity building for human resource development	<ul style="list-style-type: none"> • Business programmes were conducted to build capacity on different subjects • Conducted Block Festivals in collaboration with Unnava, Wayanad during June, 2010 & 2011. • Conducted Farmers day celebrations in collaboration with CMHS, Ambalavayal 2010 & 2011 • Farmer's interaction and counseling programmes on agricultural crisis and related issues - in three blocks

VII. Success Stories / Salient Results

A. Geographical Indication registration for the Wayanadan Scented Rice Varieties *Jeerakasala* and *Gandhikasala* was completed in association with *Wayanad Nellulpadaka Sahakarana Sangham*. Sri. Krishna Prasad, MLA handed over the certificate to *Wayanad Nellulpadaka Sahakarana Sangham* on 22nd November, 2010.

Results

After getting GI registration, *Jeerakasala* and *Gandakasala* Rice Varieties got wide publicity about their unique quality. This resulted in remarkable increase in demand and price. Two fold price hike was noted in these two varieties after winning GI registration.

B. Interventions in paddy - Promoting scientific group farming system by organising the farmers of each farm group as a unit by the following steps.

- Lime and fertilizer application on the basis of repeated soil test
- Introduction of bio-control measures for disease and pest management
- Popularization of HY paddy variety *Athira* and *Uma*
- Popularising mechanization in paddy fields.
- Crop rotation with pulses and oil seeds in summer paddy fallows.

Results

- By adopting the scientific methods of soil and crop management the productivity has increased by 20.46% in the first crop season (*Nancha*) and 19% in the second crop (*Puncha*) season.
- Area under paddy cultivation was increased by 12.21%

C. Women Empowerment

i. Establishment of SHGs for livelihood security of women

Three SHGs were established involving 33 women members. This includes one SHG for vegetable and fruit processing (three members), One SHG for planting material production (6 members) and one SHG for vegetable seed production and nursery management (24 members).

Results

- The total turnover of the SHG on vegetable seed production and nursery management is 7.24 lakhs, which provided an additional average annual income of Rs. 36,210 per household.
- Vegetable & fruit processing SHG at P*V* is producing and marketing 25 value added products. The turnover of the SHG was 2317 kg per

b. Established backyard poultry, piggery and goat units

533 back yard poultry units with 3,198 birds, four piggery units with nine pairs of breeding stock and 60 backyard goat rearing units with one goat each were established in the project area.

Results

- Back yard poultry is the most accepted practice by the farmers of the project area. Being a cost effective and profitable practice it is disseminating quickly in the district. The practice also helped to improve the nutritional status of the families of the area.
- Pig rearing is an ideal and profitable practice in an integrated farming system. This is also advisable as a viable practice for waste management and biogas production.
- Back yard goat rearing is also a recommendable practice.

D. Tribal empowerment

Eight hectares of forest land is planted with 57 species of medicinal plants to ensure the availability of natural medicines. Two acres of forest land is converted in to a medicinal plant garden (65 species) Popularization of medicinal plant cultivation in tribal home gardens (32 species of medicinal plants were supplied to 91 tribal families under two SHGs)

Steps undertaken to improve the nutritional status of tribes (Fruit plants, leafy vegetables, summer and cool season vegetables were

supplied and planted in the home gardens of each tribal family - Training and awareness programmes were also conducted

Results

- Home gardens of the tribal families were planted with common medicinal plants used by the traditional medical practitioners. This will help to reduce the dependency on the forest for the same. 50% of the medicinal plants were established in the forest area and 30% in the homesteads of tribes.
- By the cultivation of vegetables the tribal families could be able to save an amount of Rs. 600/ month towards the cost of vegetables. The practice also helped most of the tribal families to earn an average additional income of Rs. 2500 by selling the surplus produce.

E. Interventions in Vegetables

Popularization of - HYV of vegetables in kitchen gardens and schools.

HYV of cool season vegetables and

HYV of vegetables for large scale cultivation

among SHGs.

Results

- Most of the farmers could meet their demand for vegetables for a period of three months and a few of them earned an additional income of Rs. 500/month

- Two schools in the project area successfully cultivated both summer and cool season vegetables clubbed with the curriculum of the students.
- Farm groups cultivated vegetables successfully and earned an average income of Rs. 31,000 / season.

F. Interventions in Multi Layered Farming Systems

- Revitalized and diversified the degraded home gardens by planting suitable crops of various types
- Scientific & systematic planting of pepper helps to replace most of the diseased black pepper in the project area. (Supplied pepper Cuttings: 2,02,490 nos., and standards - 9192 nos.)
- Introduction of suitable subtropical fruit plants like mangosteen, rambutan and avacado which have high nutritional value and market price and also popularized high yielding varieties of mango, orange, guava, sapota, lime etc. (27,155 seedlings)
- Popularising high yielding varieties of plantation crops like cocoa, coffee, coconut, arecanut, etc (27331 seedlings)
- Popularization of spices like nutmeg, garcinia, clove, all spice, cinnamon, etc (38289 seedlings)
- Popularization of timber yielding plants' cultivation like teak, mahogany, jacks etc (3901 seedlings).
- Introduction of following high yielding varieties of tissue culture banana (4530 plantlets of Grand Naine, Amrith Sagar, Dwarf Cavendish, Robusta, Bodles Alta Fort, Monthan and Yangambi)

G. Farmers owned markets - Established 15 collection points (farmer owned markets) and one retail outlet for the collection and marketing of farm produce. 15 persons were engaged at the collection points and retail outlet. Provided transportation facilities for diversion of excess agricultural produces. Provided necessary infrastructure for farmers owned markets.

The collection centers serve the marginal producers who have small marketable surplus of vegetables and fruits apart from commercial producers. House to house collection of surplus produce is also provided as service. These types of intervention for effective marketing by avoiding intermediates have been launched at a national level.

Results

Traded 1,273.01 tons agricultural produces with a value of Rs. 192, 99, 275/- Transported agricultural produce to outside market (75 tons jack fruit. Average price Rs.5/kg) - Traded 268.72 tons of agricultural produce valued Rs.40, 94, 374/-

H. Organic Farming - Organically produced and marketed agricultural produces in the brand name "Wayanad Classics" - Promoting organic farming and organic certification among more number of farmers; collection and marketing of organic produces

Results

- 76 farmers obtained organic certification in 2018. 709 farmers are practicing organic farming. 1000 farmers are under conversion to organic, and 1000 farmers are under organic farming.

- Collected 30 tons of organic ginger and 3.7 tons of organic turmeric; and exported to processed organic spices. Provided 20-33% premium price to farmers for the produces.
- Procured and exported 5 tons of green pepper from farmers and provided 40% of premium price to farmers
- Collected and exported 35 tons of organic coffee from farmers and provided 30% premium price to farmers
- Collected and exported 20 tons of jackfruit from farmers and provided Rs.2.5/kg of jackfruit.

VIII. Synergy Developed in Collaboration with Departments / Private Sector / Others

Activities of Non Governmental Organizations, various Government agencies and other input agencies converged to a single platform under the project. NAIP-Agricultural Sustainable Fund Committees were formed in each Panchayath through which, an effective and participatory input supply system was established. The farm mechanization facilities are being provided to farmers through "*Haritha Karsaka Yathinutkarana Sangham*" an SHG under NAIP scheme to reduce the cost of labour during the peak period of farm operations. Timely interventions by various Governmental Institutions like KAU, IISR, RCRS and VFPCK enhanced the confidence of the farming community and helped to fetch fair market price for their produces. WSSS (an NGO) and KAU gave more emphasis on value addition and post harvest handling of spices and fruits respectively which provide more returns to the

farmers of the district. Krishi Bhavans under State Agri Dept. Animal Health Dept., Fisheries Dept. are also involved in the scheme.

IX. Sustainability Fund and Other Steps Taken For Post Project Sustainability

Participatory mechanism for effective implementation of project activities and continuation of the group action even after the completion of the project has been incorporated in the project. A beneficiary share for each input supplied under the project is deposited in group accounts for future activities.

"RARS-NAIP Agricultural Sustainable Committees" have been registered under Societies Registration Act in all the nine Panchayaths. Sustainable funds to the tune of Rs. 16.0 lakhs have been collected as beneficiary share till date.

X. Publications

- Research papers - 4 Nos
- Books - 4 Nos. (*Way to success – NAIP Success Stories, Social status – Wayanad, Climate Change and Crops in Wayanad District and Characteristics of Traditional Varieties of Paddy – Wayanad*)
- Video - 1 No. *NAIP Success stories.*
- Leaflets/Handouts - 26 Folders.

XI. Financial Achievements (as on 31-3-2012)

<i>Partnes</i>	<i>Total budget allocation Dec 2008 to March-2012 (Rs. In lakhs)</i>	<i>Total Fund Released Dec 2008 to March-2012 (Rs. In lakhs)</i>	<i>Total Expenditure Dec 2008 to March-2012 (Rs. In lakhs)</i>
KAU	526.76	329.65	328.66
IISR	33.92	23.17	22.58
VFPCK	41.39	27.20	27.17
RCRS	32.34	11.85	0.52
WSSS	40.05	14.19	12.16
DP	36.26	14.45	14.45
Grand Total	710.72	420.51	405.54



A summary of the garden's layout.



A view of the garden's layout.



A group of people gathered around a table.



A table set up outdoors.



A white van parked on a dirt road.



A group of people standing in a line.



A road winding through a lush green landscape.



A road with a large tree on the right side.



श्री. अ. क. शर्मा



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श्री. अ. क. शर्मा



फील्ड इन्स्पेक्शन लीड BY NATIONAL CHAIRMAN



ACI

