



Dairy Farming - Vaccination

- ✱ Inherent problems of the locality like water-logged condition, soil salinity and paucity of natural grass

#### Interventions

- ✱ Vaccination
- ✱ Deworming
- ✱ Mineral / vitamin supplementation

#### Performance indicators

- ✱ Low disease incidence
- ✱ Daily increment to the tune of 1.5 L milk per treated cow (from 7.5 L/day to 9 L/day)
- ✱ Net earnings increased from Rs.41.75 to Rs. 55.5/day/dairy cow

#### Dairy farming with paragrass

- ✱ Paddy straw was scarce and costlier in the village due to decline in paddy cultivation, water-logged condition and soil salinity
- ✱ Farmers were possessing limited knowledge regarding the saline-resistant and nutritious fodder grass
- ✱ A saline tolerant, nutritious, high yielding and palatable fodder grass variety-paragrass was introduced
- ✱ The average yield was 10 t/ha fetching Rs. 35,000 as net returns
- ✱ Farmers were increasingly adopting this fodder grass cultivation as a source of roughage for cattle

#### B) Poultry

##### Problems

- ✱ Country birds with low egg laying capacity were used
- ✱ Prophylactic practices were not followed

##### Interventions

- ✱ The improved variety 'Gramalakshmi' was introduced

##### Performance Indicators

- ✱ Better egg-laying capacity (average number of eggs produced per 10 birds per day increased from 3 to 5)
- ✱ Egg weight increased from 32 to 40 g
- ✱ Meat weight showed an increment of 0.5 kg from 1.5 kg to 2 kg in the treatment



Vaccination -

- ✱ Low susceptibility to disease
- ✱ Net returns increased from Rs. 2.42 to Rs. 5.96 per day

#### SITE COMMITTEE MEETINGS

A Site Committee was constituted under the chairmanship of Prof. Dr. Mohan Joseph Modayil, with ICAR officials, various Heads of divisions of CMFRI, CIFT, KAU, CPCRI, State Government Departments such as Agriculture, Animal Husbandry and Fisheries as members and Dr. R. Sathiadhas, Principal Scientist & Head, SEETTD, CMFRI as the thematic leader and Member Secretary.

- ✓ First site committee meeting was held on 8<sup>th</sup> December 2000 and gave approval for 30 interventions over a period of 3 years and implementation of 17 interventions in the first phase
- ✓ Second site committee meeting was held on 18<sup>th</sup> June 2002 and approval was given for 15 interventions
- ✓ Third site committee meeting was held on 14<sup>th</sup> May 2004 and six refined interventions were approved for horizontal expansion



Site Committee Meetings

#### POTENTIAL FOR WIDER TRANSFER AND IMPACT PROJECTIONS

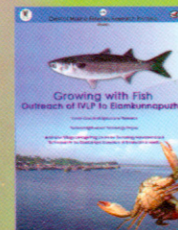
- ✱ The experiments at Elamkunnappuzha proved that the average yield of *Mugil cephalus* is 4,050 kg/ha and *Chanos chanos* 5,500 kg/ha with an average farm-gate price of Rs. 115/kg and Rs.70/kg respectively. If 20,000 ha of potential area of Kerala is brought under monoculture and polyculture of finfishes in a time span of 10 years, an additional production of 60,000 t could be attained, fetching a surplus revenue of about Rs. 420 crore per annum even if an average production of 3 t/ha with an average price of Rs. 70/kg is anticipated.
- ✱ The coastal districts of Kerala have a coconut plantation area of 7,46,046 ha with an annual production of 486 crore coconuts. The IVLP experiments have shown an increment of 48 nuts per palm per annum by Integrated Nutrient Management. If this intervention is replicated in at least 20% of the coconut farming area of coastal districts of the State in a time span of 5 years, an additional production of about 52 crore coconuts could be achieved even with an annual increment of 20 nuts per palm. The surplus net returns after deducting additional expenses per annum for INM would be about Rs.190 crore from the coconut plantation of coastal districts of the State.
- ✱ Elamkunnappuzha experiments showed a daily increment to the tune of 1.5 L milk per treated cow (from 7.5 L/day to 9 L/day). This intervention, if applied to at least 20% of the cattle population in Kerala in a time span of 5 years, the surplus milk yield would be about 1,000 tonnes per day. The surplus revenue would be about Rs. 220 crore per annum from milk production alone.
- ✱ The poultry showed an increment of 2 eggs per 10 birds per day (from 3 eggs per 10 birds per day to 5 eggs per 10 birds per day) with the introduction of improved variety "Gramalakshmi". The additional egg production per day would be about 10 lakh eggs, if the intervention is applied to 20% of the population. The net revenue generated would be about Rs. 12 crore per annum from additional egg production alone.

#### EXPECTED IMPACT

- ⇒ By following the four identified interventions, at an adoption rate of 25% in the coastal belt of the State, a surplus production of about 60,000 t fish, 52 crore coconuts, 2.7 lakh tonnes of milk and 200 lakh eggs could be obtained contributing to the State an additional returns of Rs. 842 crore per annum.

#### MAJOR PUBLICATIONS

- ✱ Books: 4  
CMFRI Special Publication Nos. 75, 81, 82, 87
- ✱ Research Papers: 5
- ✱ Popular Articles: 4
- ✱ Video Film: 1
- ✱ Extension folder: 1



Video Film



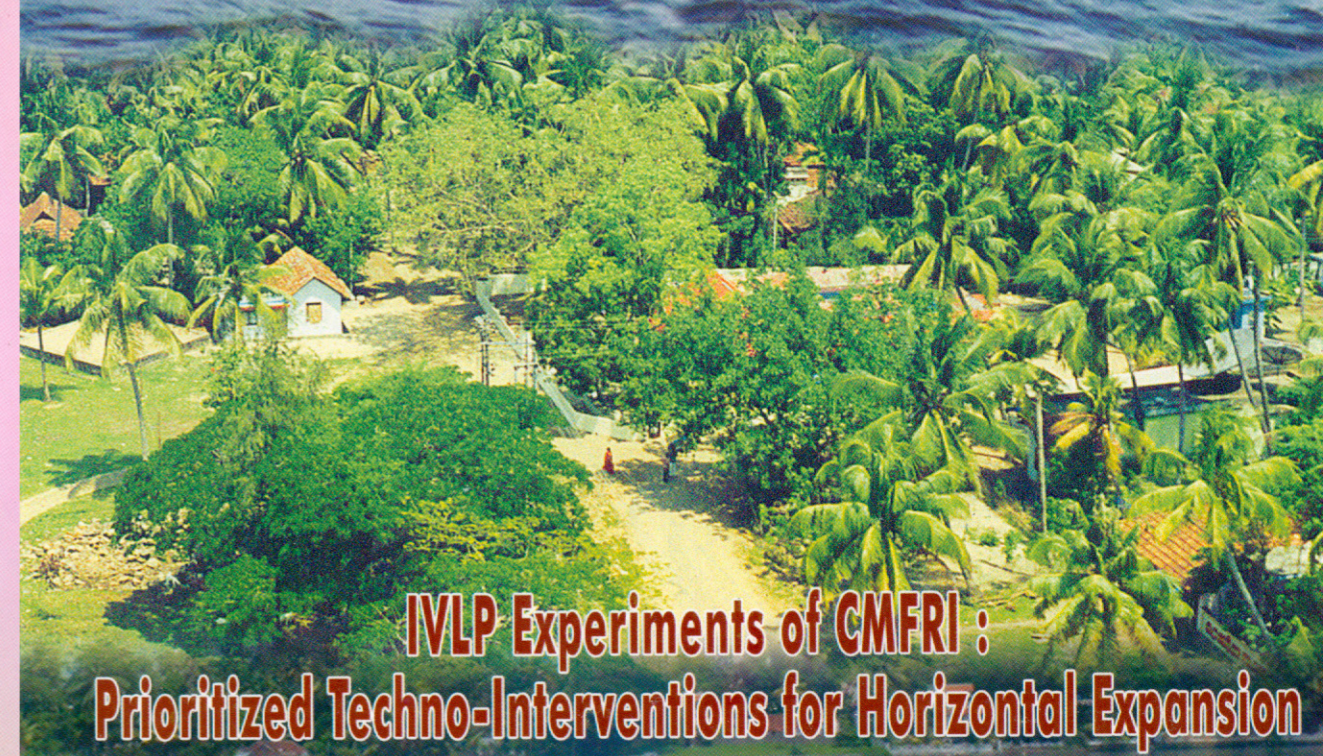
Special Publications of IVLP

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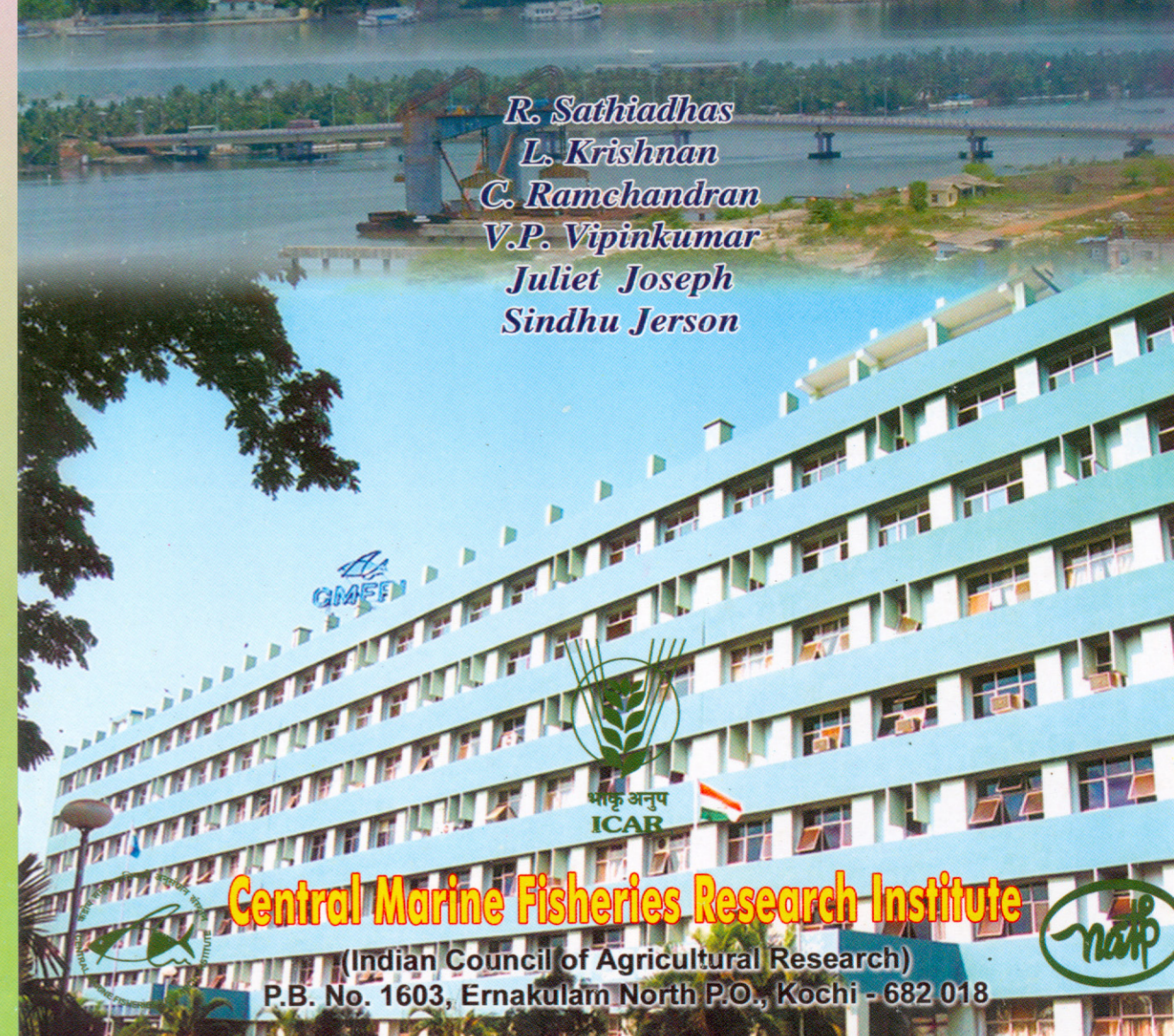
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# NATIONAL AGRICULTURAL TECHNOLOGY PROJECT



## IVLP Experiments of CMFRI : Prioritized Techno-Interventions for Horizontal Expansion

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## Benefits

- ☉ Production increment of 1.3 t/ha (from 5,700 kg/ha to 7,000 kg/ha)
- ☉ Net profit for treatment was Rs. 4.43 lakh/ha as against Rs. 2.54 lakh/ha by farmers' practice

## II. Agriculture Based Intervention-INM in Coconut Plantation

Almost all the agricultural interventions produced better results. Kerala depends on other States for its requirement of vegetables and other agricultural products. There is enormous demand for vegetables in the urban Ernakulam market and hence there is immense scope for enhancing vegetable production along the embankments of ponds. However, the most outstanding intervention having far reaching impact on coastal agro-ecosystem is Integrated Nutrient Management (INM) Practices in coconut plantation, which needs to be accorded top priority.



Non-Treated Coconut Trees

- ❖ Most of the people in the coastal belt depend on earnings from fisheries and coconuts for their livelihood
- ❖ Fertilizer application and appropriate management practices were lacking in most cases
- ❖ Introduction of INM based on soil test data
- ❖ Recommended nutrient dosage per palm was 1kg lime, 2kg urea, 2kg super phosphate, 2 kg murate of potash, 1kg magnesium sulphate and 0.5 kg sunhemp seeds per annum

### Performance indicators

- ★ Number of bunches per palm increased from 7 to 9
- ★ Number of nuts produced per bunch increased from 6 to 10
- ★ The number of nuts per palm increased by forty-eight (from 42 to 90) per annum
- ★ Nut weight showed an increment of 475g
- ★ Net returns were Rs. 0.5 lakh/ha for treatment as against 0.15 lakh for farmers' practice



INM Treated Coconut Trees

## III. Livestock Based Interventions

### A) Dairy farming

#### Constraints

- ★ Absence of scientific practices like prophylactic measures and feed supplementation

➤ **Livestock** - Centre for Advanced Studies in Poultry Science (CASPS), College of Veterinary and Animal Sciences (CVAS) of KAU, District Animal Husbandry Office and Village Veterinary Clinic of Government of Kerala-marketing outlets

➤ **Agriculture** - KVK of CMFRI, Agricultural Technology Information Centre (ATIC) of KAU, Banana Research Station, Kannara of KAU, Krishi Bhavans of Government of Kerala, Department of Agriculture, Government of Kerala, Laboratories and Nurseries of various institutions and fertilizer firms

All the interventions were functionally linked with the stakeholders mainly through a pair of key informants, frequent visit of scientific personnel and a group of progressive farmers. The linkages developed in this programme enabled the stakeholders to sustain and continue their efforts.

## TECHNOLOGIES FOR HORIZONTAL SPREAD

- ⇒ Altogether 31 techno-interventions were assessed and refined in farmers' fields (13 fisheries, 5 livestock and 13 agriculture)
- ⇒ Number of farm families participated in TAR experiments of CMFRI were 687 with the average family size of 5
- ⇒ The total population covered under this programme is 3,435
- ⇒ Selected and prioritized techniques having far reaching impact in the coastal agro-ecosystem pertaining to fisheries, agriculture and livestock are discussed below

### 1. Fishery Based Interventions

- ❖ Although shrimp farming proved to be very profitable on account of its high market demand, there are areas unsuitable for shrimp farming where they are cultured due to sheer greediness and ignorance
  - ❖ Instead of utilising such areas for shrimp culture, other species like finfish and crab which could fetch better and optimum returns could be highly advisable in monoculture and polyculture production systems
- The common problems encountered in all types of fish culture practices (Farmers' experience) are:

- ☆ Improper pond preparation
- ☆ Lack of quality seed
- ☆ Unscientific stocking density
- ☆ Multi-species culture
- ☆ Poor water exchange
- ☆ Inadequate financial support
- ☆ Lack of knowledge about improved culture systems

#### A) Monoculture of grey mullet (*Mugil cephalus*)

##### Interventions

- ☆ Eradication of predators prior to stocking
- ☆ Stocking at a standardised rate of 15,000 seed/ha
- ☆ Fabricated sluices introduced for better water exchange
- ☆ Fish feed with wheat bran, rice bran and oil cakes recommended



Dr. Mario Pedini, World Bank Expert, visits Fish Farming Site

##### Benefits

- ☆ Increase in yield (55%) from 2,625 to 4,050 kg/ha
- ☆ Net profit was Rs. 2.76 lakh/ha as against Rs. 1.18 lakh/ha in the farmers' practice

#### B) Monoculture of milkfish (*Chanos chanos*)

##### Interventions

- ☒ Eradication of predators prior to stocking
- ☒ Standardised stocking rate of 15,000/ha



Harvesting of Milkfish

##### Benefits

- ☒ Production increment of 1.75 t/ha (from 3,750 to 5,500 kg/ha)
- ☒ Net profit of Rs. 2.23 lakh/ha against Rs. 0.85 lakh/ha by farmers' practice

#### C) Polyculture of finfish (milkfish and grey mullet)

##### Interventions

- ☉ Fabricated sluices for better water exchange
- ☉ Natural entry of fish restricted
- ☉ Eradication using mahua oil cake



Visit of Dr. E.G. Silas, Chairman NATP Review Team to the Finfish Farm

## BRIEF PROFILE

Institution Village Linkage Programme (IVLP) for Technology Assessment and Refinement (TAR) is one of the major extension programmes of Indian Council of Agricultural Research (ICAR) under National Agricultural Technology Project (NATP) implemented for introducing improvements in the existing production systems through better scientific management practices. IVLP for TAR in the Coastal Agro-Ecosystem is carried out by Central Marine Fisheries Research Institute (CMFRI) in Elamkunnappuzha Village of Ernakulam district in Kerala. The coastal agro-ecosystem analysis and the extension model are replicable to other coastal agro-ecosystems with similar features. The impact of this intervention has been highly appreciated and acclaimed and is now popularly known as "Elamkunnappuzha model of development".

## OBJECTIVES

- ❖ To assess the needs and identify the coastal agro-ecology and production system perspectives of various technologies of the village
- ❖ To introduce improvements in the existing production systems through better scientific management practices to enhance productivity without endangering the stability and sustainability of the environment
- ❖ To improve the innovative well defined farm production systems with multiple options for the purpose of refining the technologies in the context of sustaining higher productivity and obtaining profitability
- ❖ To give specific considerations in the introduction of income and employment generating activities for the weaker sections of the society and women work force to promote the distributive justice and to maintain parity and equity in the village economy
- ❖ To examine the impact of refined production technologies in the coastal agro-ecosystem
- ❖ To transfer the proven refined technologies to the Extension System for their further propagation and implementation

## PARTICIPATORY RURAL APPRAISAL (PRA)

- ☐ Ensures greater farmer-scientist linkage
- ☐ Accessibility to technologies generated by research institutes
- ☐ Assess primary production pattern and its potentials
- ☐ Focus on integrated whole village development
- ☐ Rural people themselves do much of the investigation, planning and evaluation
- ☐ Techno-interventions through community participation



Participatory Rural Appraisal (PRA)

## MICRO FARMING-SITUATIONS

- ☉ Tide-fed brackish water system
- ☉ Open sea-based coastal agro-ecosystem
- ☉ Homestead animal husbandry and poultry farming system

- ☉ Rainfed agri-horticulture system
- ☉ Low-lying seasonal paddy (*pokkali*) fields

## TRAINING PROGRAMMES

- ☉ 15 field level training programmes (6 fisheries, 4 livestock, 5 agriculture)
- ☉ 318 females in a total of 576 trainees
- ☉ Field exposure to institutions and progressive farms
- ☉ Supply of leaflets and training notes in Malayalam
- ☉ Formation of Self Help Groups (SHGs)

## LINKAGES

- **Fisheries** - Central Institute of Fisheries Technology (CIFT), Fisheries Research Station, Puthuvypu of Kerala Agricultural University (KAU), Department of Fisheries, Government of Kerala, ADAK, Government of Kerala and input suppliers - shrimp hatcheries - fish/crab collectors - auctioneers - net makers



Training Programmes under IVLP