

resource handbook

*Planning and Monitoring
collective local
resource mangement in the
Kalivelli Watershed*



Foundation for Ecological Research, Advocacy and Learning

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Foundation for Ecological Research, Advocacy and Learning

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Foundation for Ecological Research Advocacy and Learning, Pondicherry

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Table of Contents

Part 1

List of Abbreviations	2
Executive Summary	3
Why do monitoring, assessment, and evaluation?	4
Monitoring and Planning - Activities and Tools	12
Baseline Information Collation	13
Resource Use and Opportunities	16
Basic Hydrology and the impacts of rehabilitation work	20
Effective functioning of Community Based Organisations	23
Decision Support Systems and the project	23

Part 2

Adavallikuttan	29
Alankuppam	32
Aruvadai	35
Endiyur	38
Karattai	41
Karsanur	44
Kayilmedu	47
Kuttappakkam(Kil)	50
Puduppattu(Kil)	53
Kunjimangalam	56
Kunimedu	59
Kovadi	62
Manur	65
Molasur	68
Nalmukkal	71
Kilappakkam	74
Omandur	77
Kodippakkam(Ten)	80
Siruvalur(Ten)	83
Terkunam	86
Agaram (Vada)	89
Nerkunam (Vada)	92
Vangaram	95

PART - I

List of Abbreviations

CBO	- Community Based Organisation
DSS	- Decision Support System
FERAL	- Foundation for Ecological Research, Advocacy and Learning
GIS	- Geographic Information Systems
GPS	- Global Positioning Systems
ICEF	- India Canada Environment Facility
IGP	- Income Generation Programme
MITS	- Minor Irrigation Tank Systems
PRA	- Participatory Rural Appraisals
PWD	- Public Works Department
RF	- Revolving Fund
RS	- Remote Sensing
SHG	- Self Help Group
WPG	- Women Puttadaar Groups
WUA	- Water Users Association

Executive Summary

Initiated in 1999, the ICEF project on tank rehabilitation in the Kalivelli watershed, saw several activities being taken up to achieve the ultimate goal of improved and sustainable livelihoods. Several targets have been exceeded. Yet an assessment is needed of the assumptions we started the project with, strategies that were followed and the cost effectiveness of these. The monitoring and assessment exercises conducted by FERAL have addressed several of these issues using a number of methods and technologies. These have covered the range from simple questionnaire surveys, database modules, Geographical Information Systems to participatory appraisal methods. Several innovative methods have been developed for effective project management and adopting an adaptive management approach to local resource development and productivity enhancement.

This handbook focuses on the various tools utilised and information analysed during the course of the project by the Monitoring and Planning team. A large database has been generated for the region and participatory methods for planning, monitoring and assessment have been designed and applied on field. The first section of the handbook presents this information and the methods used in the context of the major activities of the project. The second section presents a village wise compendium of maps, statistics and achievements of the different CBOs initiated in the last five years in these villages. The aim of the handbook is to provide village communities with the required baseline information, maps and monitoring tools easily accessible at any point in time. This comprehensive overview can be utilised by them for their future planning needs and monitoring of activities.

Why do monitoring, assessment, and evaluation?

These are good questions. And they are questions that are often asked by implementing agencies who are annoyed by the time, effort, and expense that would be better employed getting more "real work done". This is especially true when the "real work" is on activities that everyone knows are good things to do. The annoyance factor is increased when those assessments and evaluations include pointy-headed academic questions and fancy analysis that 'no one is going to use'¹.

The "real work"- that is the deliverable activities such as Grameen banks, tree planting and tank desilting - are however not the ultimate goals of a project. In fact these applied activities are usually two or three steps removed from the ultimate goals of the project. In the case of the ICEF project being discussed in this handbook one of the ultimate goals was the sustainable improvement in the local welfare in the project villages. One primary objective to achieve this goal was through increased agricultural output. The instrumental objective that we believed would lead to increased agricultural output was increased irrigation. This finally led us to the activities or applied deliverables of supply channel clearing, distribution channel repair, bund repair, jungle clearing and tank bed desilting.

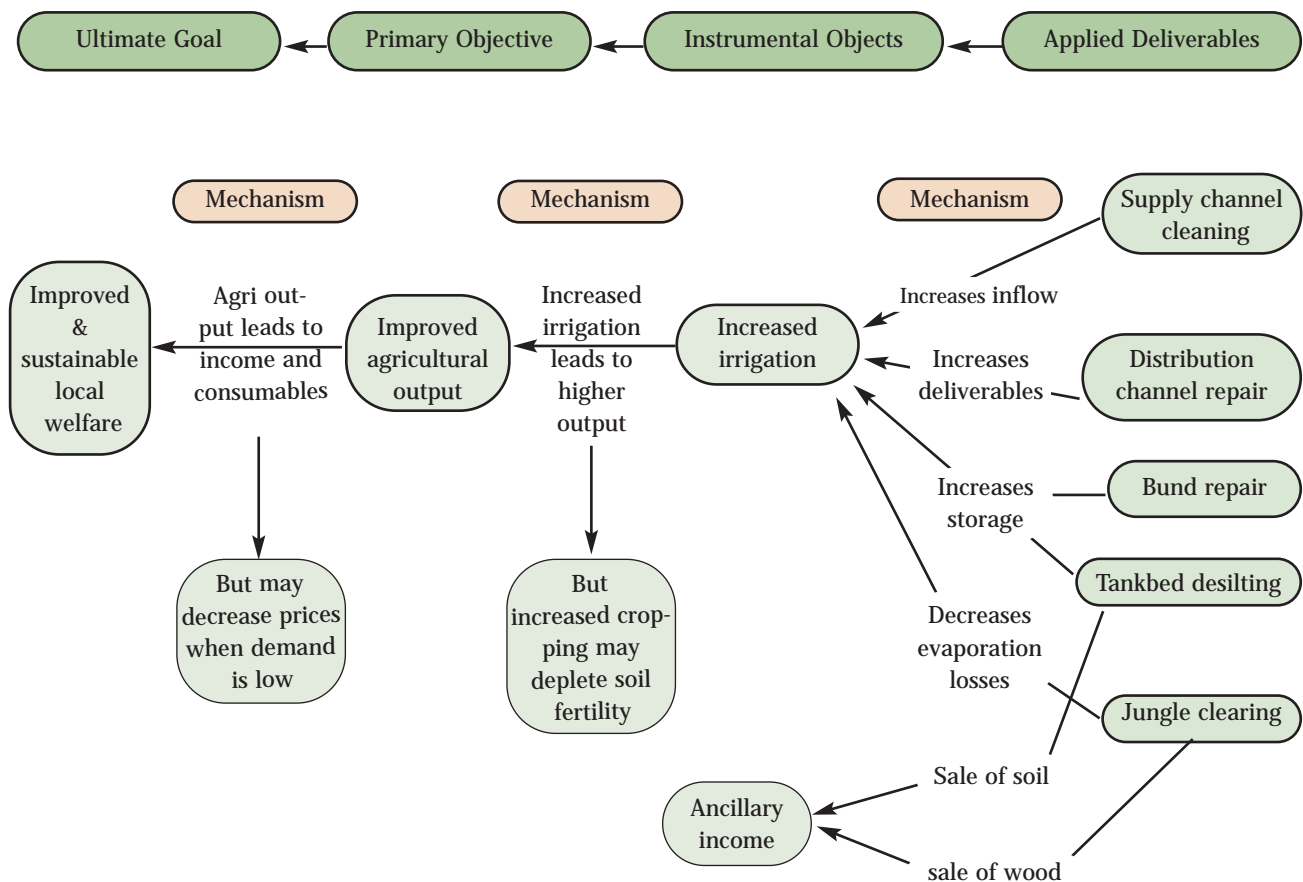
To the implementing agency that chain of logic is usually painfully clear and obviously true. So once again, "Why do monitoring, assessment, and evaluation?"

The answer is six fold. First, it is always a good idea to make certain that the applied activities are actually occurring. Second, it is necessary to determine the extent to which the applied deliverables actually make their way back up the chain to the ultimate objective. Third, it is wise to determine the cost sensibilities of a given activity. Fourth, there are occasionally unintended consequences of otherwise good were activities. Fifth, 'what everybody knows' is occasionally quite wrong. Finally, monitoring and evaluation provide insights into potential innovations in the system.

Applied deliverables

In the case of the applied deliverables for the ICEF project, many targets were exceeded. Thirty one tanks were rehabilitated instead of twenty three. Seventy-eight Self Help Groups formed in 43 villages that raised over 112 lakhs of internal funding and external financial assistance. So it was a really good idea to keep track of these, it makes every thing look pretty good. But it is also important to try to understand why and how these targets were exceeded, so

Figure 1: Goals, Objectives and deliverables on the ICEF project.



1. These issues were raised by Anne Mott of the US Forest Service at the Community Based Collaborative Research Consortium meeting in Cicso, Colorado, USA June 7-8, 2004.

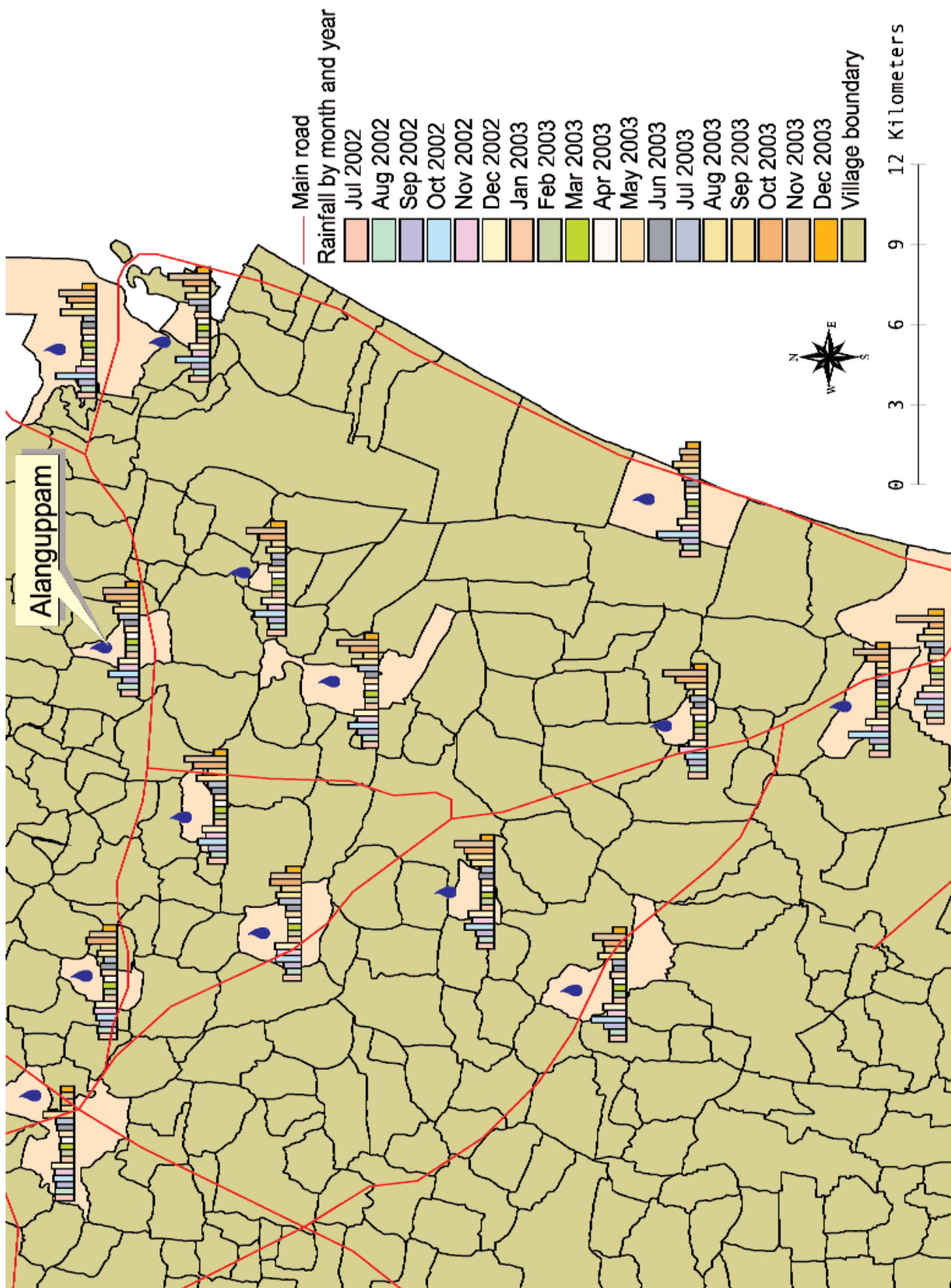
2. The reason most organizations choose to focus on a set of activities is because they believe they will work.

that information can be passed on to other projects in other places and times. When barriers to success are identified, it is important to identify the bridges to overcome those barriers. The point of evaluation and assessment is to improve the process - not to blame people for failures.

Causal Mechanisms

Increasing irrigated acreage has been hailed as a boon to agriculture for centuries. And for centuries, people have pointed out that when those increases have happened on

marginal lands, the increase in production has been insufficient to justify the cost of adding those lands into production. Such critics have included the likes of 17th century economist David Ricardo, environmental activist Baba Amte and former IAS officer Anil Shah. The marginal lands phenomenon only appears to be moderately true in this project where the bottom 20% of farmers are producing rice yields well below the value of the water and other inputs used on these lands.



Beyond looking at accuracy of the causal relationships, it is also important to compare the strength of these relationships. The economic importance given to rehabilitation works was in the order of desilting, bund strengthening, supply channel clearing, jungle clearing and distribution channel clearing. But when we look at the strength of these relationships in terms of providing additional acreage planted we see a different story. In the case of Alanguppam, full cropping was not possible in the command. The first activities done were channel and jungle clearing with no desilting. This was followed by a full season of irrigation in the first planting season and half the command in the second season. The next year desilting was done but there was no successful crop acreage in the following season. The following season the command rebounded with a full cropping. Thus, given that impact of activities are differential clear choices need to be made.

Economic Sensibility

Engineers are fond of telling us how many thousand million cubic feet of irrigation capacity they have created. But to the farmer a million cubic feet is merely 23 acre feet or roughly enough water to grow 7 acres of rice per year. If that farmer's land were in our project area, it would produce around 13,000 kgs of rice worth Rs 59,000³ in the first year. To a project economist, however, that fifty thousand a year has a net present value of only 1.9 lakhs, but the net cost of desilting (the cost of desilting less the sales of the silt) was 5.9 lakhs resulting in a net economic loss of 4 lakhs. There of course, may be other potential non-market benefits such as

- ▶ the increased storage providing a form of late season 'crop saving' irrigation - that two acre feet could provide over twenty acres with the last two inches of irrigation in a dry year.
- ▶ dead storage for fish production.
- ▶ a feeling of well being and a good example in the village seeing a common resource being maintained.

These are all valid and may justify the subsidy, but in a project with over ten million cubic feet cleared at an approximate cost of 148 lakh rupees, that justification is necessary.

When what everybody knows is wrong

We began this project with some certainties. The depletion in groundwater was causing increasing saline intrusion from sea water. Bore wells are a better source of drinking water than open wells. The weaker sections were suffering disproportionately from water quality issues. It turns out all were incorrect. There has not been an increasing salinity problem and the problem salinity areas are not correlated with the distance from the sea. The total coliforms in hand pumps are substantially lower than either pump based bore

wells that feed overhead tanks or open wells. And worse yet, hand pumps and pump-based bore wells had higher levels of fluorides than the open well in several locations. And it wasn't just us-this was/is conventional wisdom. The problem with the coliforms in overhead tanks is easy to fix-you just bleach the tanks when the coliform levels get unsafe. This of course requires implementation followed by monitoring, assessment and feedback.

Potential improvements and innovation in the system:

This digging around in the results and monitoring led to several innovations including:

- ▶ Fertilizer tests resulting in fertilizer mix that **increased average yield** by over 400 kgs per acres over the then existing TNDOA's 2:1:1 NPK recommendation and 150 kgs per acres over the now revised 3:1:1.
- ▶ The use of GEOPRA's remarkably led to **more rapid transition through the organization phases** for the WUA's where they were used.
- ▶ Geotracking staff time allocations showed that the amount of time spent in an area resulted in **more work done** by the groups in those areas.
- ▶ Measuring water quality identified quarries as the source of salinity in drinking water as well as the **potential for fluorosis problems** in the project area.

An endnote

Watershed and restoration projects are initiated with specific goals in mind - better land cover, increased ground water recharge, improved management practices, efficient and effective use of natural resources, etc. But to what extent are these goals achieved by project activities? Are the strategies employed by the project effective? These questions can be answered if a clear framework is laid out for monitoring and evaluation throughout the project duration. However, evaluations and monitoring often raise the spectre of examinations rather than being seen as constructive processes. Thus, for successful monitoring to take place, agencies need to be receptive to the process. Furthermore, effective monitoring requires that adequate discussion is held on the findings and follow up actions are put in to place subsequently.

3. At Rs 8 per Kg less Rs 3.5 it costs to grow the paddy; actual sale price are often lower.

The Project

In 1999, the India Canada Environment Facility, New Delhi, funded an innovative project to rehabilitate a set of minor tank irrigation systems in the Kalivelli watershed. This watershed, covering an area of 772 sq. km. across two blocks of Villupuram District, Tamil Nadu, comprises of an age-old network of 225 tanks and their channels. Most of these are in a degraded state due to changes in social and economic conditions as also policy changes. The project aimed to build sustainable community based management institutions to rehabilitate the tanks and better manage the local resources. FERAL had the role of the Monitoring and Planning Agency while implementation was carried out by Palmyra, Auroville.

Roles of FERAL

FERAL played the role of facilitator to both the Community Based Organisations (CBOs) and Palmyra for planning and monitoring project activities. This was done through planning workshops, Participatory Rural Appraisals (PRAs), micro planning exercises and independent studies which analysed progress made on various fronts. Several social

and environmental parameters were monitored to track changes and impacts of project activities. FERAL's reports helped identify areas of concern and also tried to analyse the various strategies followed by the CBOs and the various implementation teams.

The Community Based Organisations

Different CBOs were initiated in the course of the project to address specific issues. Water User Associations (WUAs) were formed with command area farmers and women Self-help groups (SHGs) with primarily landless women. Women farmers were involved through the formation of Women Puttadaar⁴ Groups (WPGs). The farmers raised resources to implement rehabilitation activities in the tank as well as initiated better water management and crop production practices. Women start with small savings and micro-credit activities, accessed government funds and took up several income generation activities. Effective involvement of women in WUAs was addressed through focussed activities and capacity building of WPG members. The five years have seen these CBOs strengthening capacities on several fronts and taking up a range of activities.

4. Puttadaar = Landholder

Background

Tanks or 'eris' are a common feature in Tamil Nadu, numbering around 30,000 to 40,000 across the state. These are irrigation structures, constructed several centuries ago to harvest surface runoff and create areas of irrigated agriculture. These tanks have degenerated over the years due to changes in the socio-economic-political conditions. The structural and irrigation capabilities of these systems have degraded over the years. Some of the contributing factors have been,

- ▶ Introduction of tube wells in the command, thereby reducing dependencies on the tank.
- ▶ Changes in social hierarchies and land ownership which contested traditional systems of access to resources and control over these.
- ▶ Changes in administrative structures whereby management was transferred out of farmers hands.
- ▶ Reduced inflows due to changed land use in the catchment area.
- ▶ Increased pressure on land leading to subdivision of holdings and more number of users.

These tanks, currently classified as Minor Irrigation Tank Systems (MITS), come under the administrative purview of the Public Works Department (PWD) when their water spread is larger than 40 hectares. The management of smaller tanks rests with the local Panchayat. This project has focussed on the rehabilitation of these tanks in conjunction with the establishment of community based organizations for their optimal use and continued maintenance. The Kalivelli watershed has some 225 minor irrigation tank systems within its boundaries. The ICEF project focuses on the rehabilitation of 31 (13%) of these. In the initial phase of the project extensive surveys were carried out (65 villages visited) to assess the response of villagers to the project and also the need and suitability of working on a given tank within the project framework. The selection of villages for project implementation has been primarily based on active participation from the concerned villages.

The project area is situated at 11° 55' and 12° 10' N, 79° 35' and 79° 55' E in the Kalivelli watershed, having a total area of 740 sq.km. (see location map on next page). The climate is tropical monsoon, with an average annual rainfall of 950 mm. Mean temperatures range from 28°C in winter to 39°C in summer. The watershed spans the Vanur and Marakkanam blocks of the Villupuram District, Tamil Nadu on the east coast of India.

The project goal was to take up activities in at least 23 of the MITS. The project strategy was to form local level institutions through which the various activities were implemented.

- ▶ Water User Associations of farmers in the command areas (ayacut) of the tank, who are not only involved in planning and implementing the rehabilitation work, but also contribute 30% to the costs of rehabilitation.
- ▶ Women Puttadaar Groups to specifically build capacities of women farmers and enable them to participate more effectively in the WUAs.
- ▶ Women Self Help Groups of primarily landless women to ensure that project benefits were distributed more equitably.

Substantial effort has gone into capacity building and training of these groups so as to help them become efficient and effective managers of their resources. A participatory approach has been integral to the project ranging from development of micro-plans, implementation of physical activities and carrying out monitoring and assessment exercises.

The Project at a Glance

REHABILITATION OF INTEGRATED TANK MANAGEMENT SYSTEMS IN THE KALIVELLI AND OUSTERI WATERSHEDS

Goal :

To improve the livelihood and long term environmental outlook for the Kalivelli and Ousteri catchment area

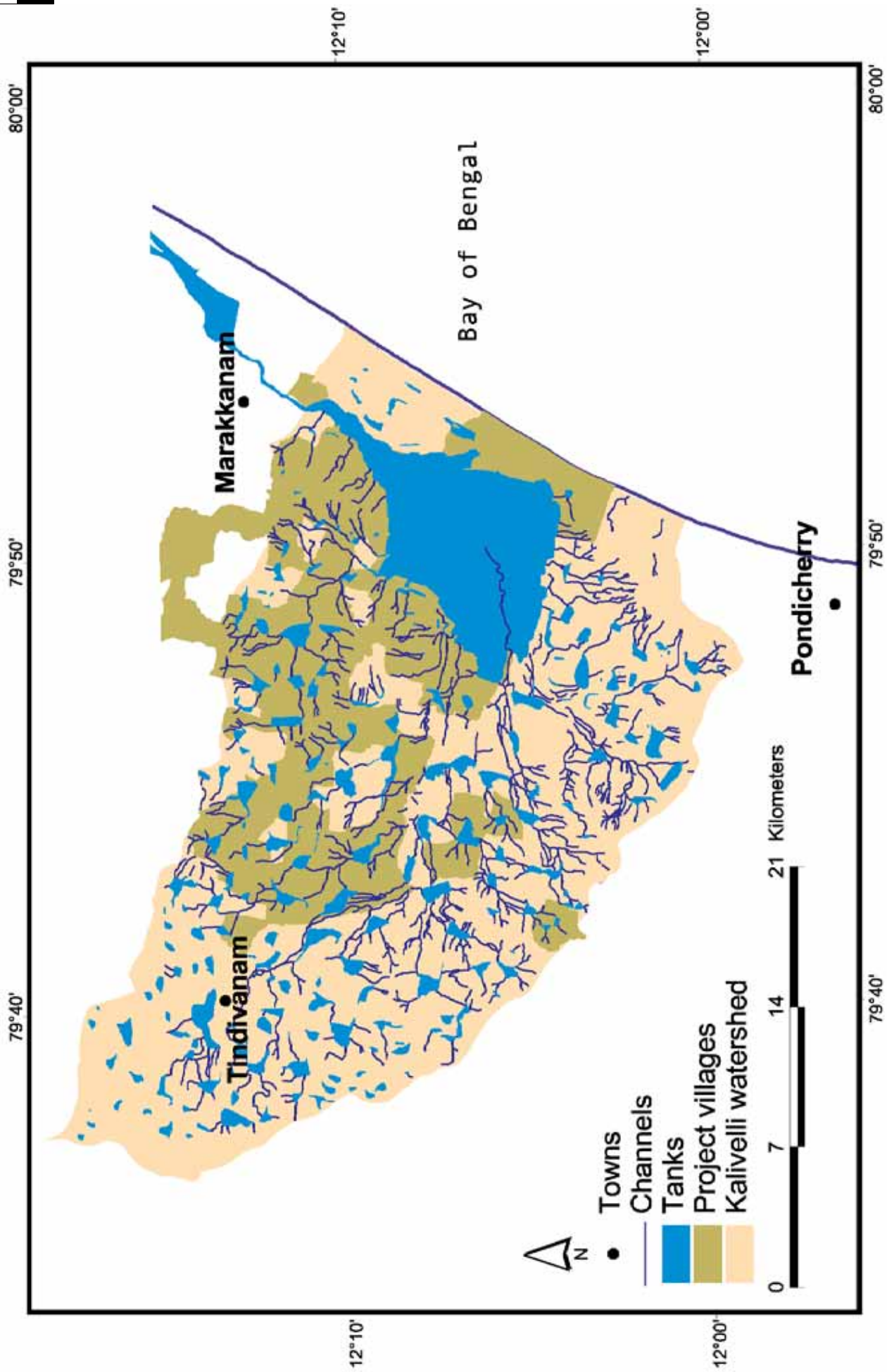
Purpose :

Set up practical and sustainable community based mechanisms to manage irrigation tanks, their associated catchments and related natural resources.

Objectives :

Set up institutional, local, equitable and democratic structures for the management of natural resources in the 23 MITS and their catchments,

- ▶ Build capacities of local groups and associations to plan, implement and monitor activities on their watersheds and to maximise biomass and income generation from them on a sustainable basis.
- ▶ Rehabilitate 23 MITS by implementing structural repairs and undertaking extensive desilting operations on them with the active participation of local communities.
- ▶ Plan and monitor all the above activities so as to maximize the efficiency of interventions and document the various processes that would serve to influence policy in favour of the experiences gained.



Expected Outcomes:

- ▶ Optimal, integrated and sustainable utilisation of tank water of 23 tanks
- ▶ Soil erosion arrested and optimal runoff facilitated in the catchment area of the 23 tanks
- ▶ Local level institutions managing the tank system in a sustainable, equitable and gender sensitive manner
- ▶ Policy change initiated with respect to participatory, farmers management of tank irrigation systems.

Fact Sheet (all figures updated as of 31 March 2004)

Funding Agency : India Canada Environment Facility,
New Delhi

Project Implementing Agency : Palmyra, Auroville,
Tamil Nadu

Monitoring and Planning Agency : FERAL,
Pondicherry

Project period : July 1999 to June 2004

Total project cost : Rs.9.59 crore

Implementation Budget : Rs. 8,68,92,452/-

Monitoring Budget : Rs.90,07,548/-

CBOs Formed:

WUAs - 32 associations with 2789 members in 27 villages

WPGs - 19 groups with 355 members in 12 villages

SHGs - 78 groups with 1451 members in 39 villages

Total number of villages covered by project activities - 51

Number of Revenue Villages				
		WUA		
WPG	SHG	Absent	Present	Total
Absent	Absent		2	2
	Present	24	13	37
Present	Absent		6	6
	Present		6	6
Total		24	27	51

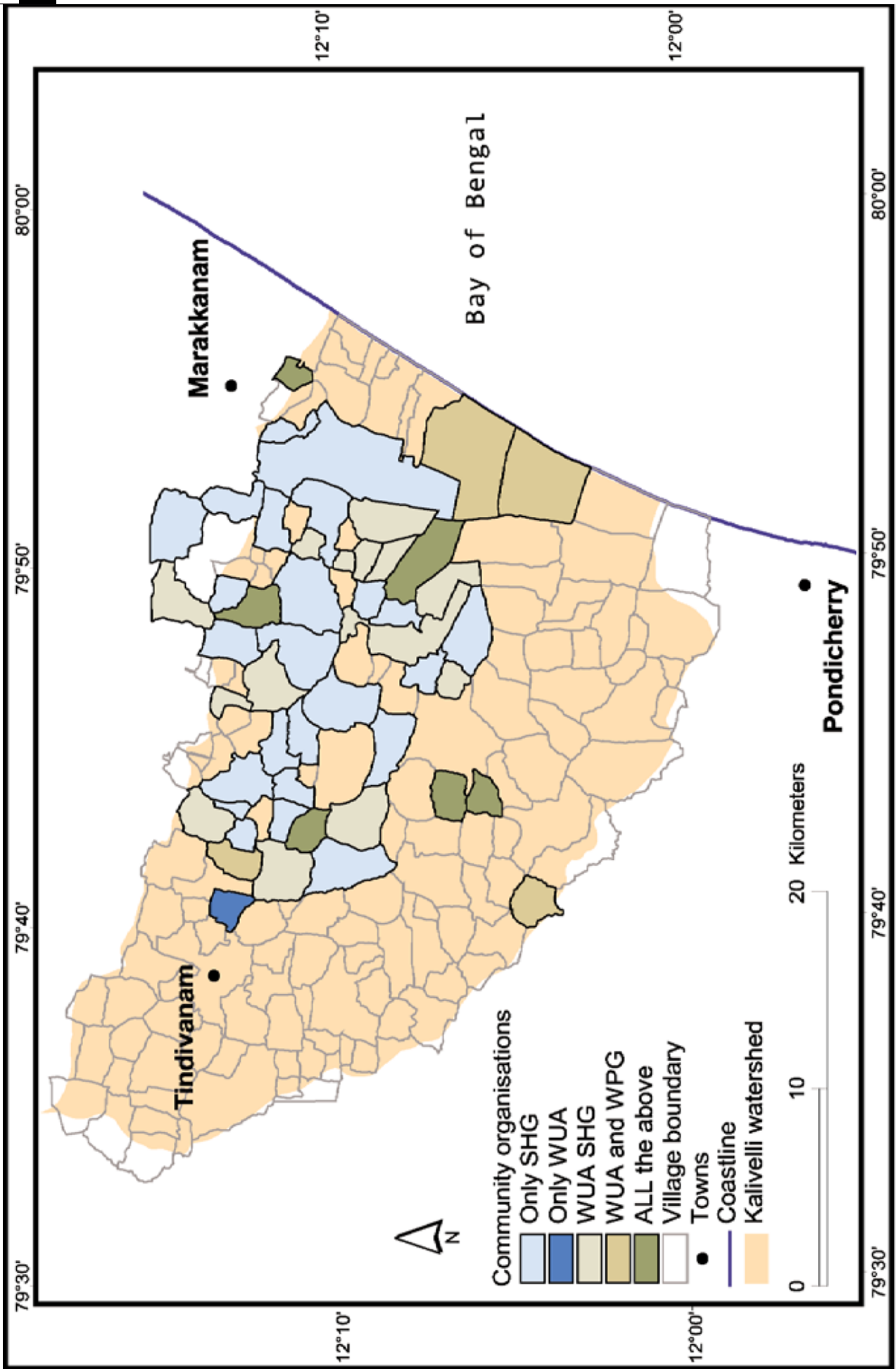
Activities

24 tanks and 4 ponds with a total command area of 1564.63 ha. and 122.84 ha. respectively have been worked on along with 2 large channels ('maduvu'). The total expenditure on physical works has been Rs.55,85,859 (30%) as farmers contribution and Rs.1,30,33,671 (70%) from project funds. A total of 297256 m³ of soil excavated, 19920 m of bund length strengthened, 8885 m of supply channels cleared, encroachments removed in two villages and storage capacities increased by 10.01 mcft.

The women groups (SHGs and WPGs) have a total of Rs.38.89 lakh of savings which is rotated amongst themselves through internal micro-credit. In addition financial assistance from the Tamil Nadu Corporation for Development of Women (TNCDW), District Rural Development Agency (DRDA) and Tamil Nadu Adi-Dravida Corporation (THADCO) has been tapped - Rs.19.5 lakh as Revolving Fund⁵ and Rs.55.06 lakh as Economic Assistance. Entrepreneurial activities taken up range from agriculture and animal husbandry to artisanal products. These groups have also been involved in joint activities with the WUAs such as planting on the tank bunds and fisheries.

Baseline information and maps have been collated and ported to GIS for the Vanur and Marakkanam Blocks. Specific surveys were conducted with 101 farmers to track agricultural practices followed by appropriate technology demonstrations set up on 62 plots. Periodic assessments were carried out with all CBOs through surveys, perusal of records maintained and participatory exercises. Detailed study of natural resource management systems was carried out in 16 villages. Environmental parameters were tracked each season - soil (1034 samples), water (1323 samples) and meteorological information collected at 15 stations. All tank features and activities carried out were mapped with a GPS. A simple database was set up for project activity tracking and management.

5. Revolving Fund involves a loan component of Rs.15,000/- and a subsidy component of Rs.10,000/-. Members utilise these for various activities. On repayment, the fund is loaned out again to the members. Thus it is a revolving amount available till such time as the group dissolves.



Monitoring and Planning - Activities and Tools

The monitoring and planning component of the project required that FERAL undertook work in five main areas. These were

1. Collection and collation of all relevant information from secondary sources for planning and assessing project activities.
2. Environmental monitoring which included creation of a database for soil and water quality and meteorological information across the project area and its monitoring over a period of five years. Vegetation cover and drainage patterns were mapped using remote sensing and GIS.
3. Participatory planning and monitoring with community based organisations which included microplanning exercises using a combination of PRA and GIS methodology. Identification of indicators was also done by the primary stake holders for monitoring their performance on various fronts. Staff movement and performance were monitored using a simple database driven *done-not done* application linked to a GIS.
4. Conducting a number of independent surveys of the CBOs, which included surveys for agriculture, perceptions and needs of SHGs and WUAs and resource use and management around Kalivelli.
5. The fifth major activity was on the hydrological front, where we set up staff gauges to facilitate measurement of water levels in the tanks and flumes to calculate outflows. Areas irrigated during each season were physically mapped using GPS units. Silt traps were also set up at the mouths of many tanks, to calculate sedimentation rates.

The following sections give details of the different activities undertaken in these areas, their key findings and the tools used in the course of our work. The primary task of any monitoring activity is to have sufficient information to make informed decisions and ensure proper implementation. This information coming in from various sources and at different times, needs to be compiled and collated so that it can be easily accessed by project managers and staff. The strength of our information management system has been the extensive use of databases, Geographical Information Systems (GIS) and Remote Sensing (RS). This helped in easy retrieval and query building for a range of information - secondary as well as primary, regular updates of project activities and tracking of environmental parameters.

Baseline Information Collation

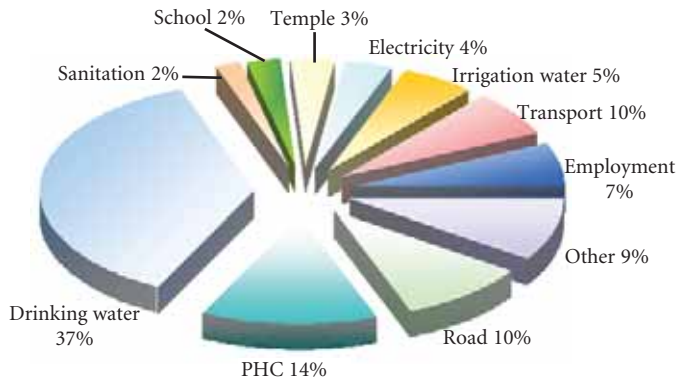
Secondary data

The project has made extensive use of secondary data for planning its activities in the initial phases. Using the revenue village as the base, we compiled all data onto a database and linked it to a GIS platform. All village maps were digitised and village level information attached to these. Sources of data were the census, cropping pattern and land use⁶ from the district statistics department, district census handbook, wasteland and watershed maps and tank information from the PWD. Analysis on these data was carried out to identify areas of interest for project activities and provide a baseline on specific parameters.

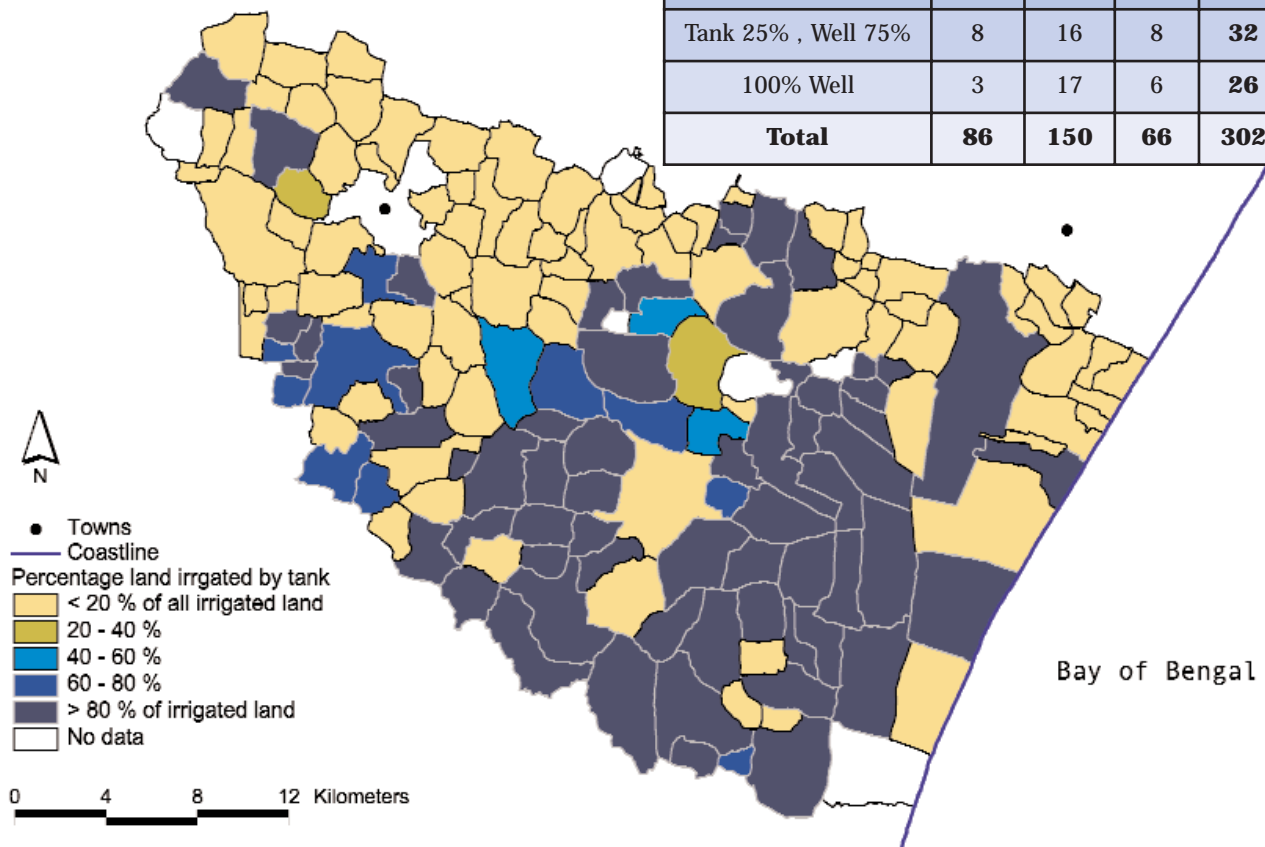
Primary Surveys

Primary surveys used standard social survey techniques as well as PRA techniques. These were carried out at different stages of the project for specific needs. An exhaustive survey was carried out initially on current tank status by the entire project team and helped establish contact in the villages as well as identify areas for work. Specific surveys were designed for tracking agricultural practices, finding out the needs and perceptions of women group members and farmers opinions of the rehabilitation work done. Other surveys done looked at the success of income generation activities initiated by the women groups and basic functioning of the different groups.

- ▶ Secondary data sources
- ▶ Databases
- ▶ Questionnaire surveys
- ▶ PRA
- ▶ Soil collection and laboratory analysis
- ▶ Water collection and laboratory analysis
- ▶ GIS and remote sensing



	Head	Midle	Tail	Total
100% Tank	57	105	36	199
Tank 75% , Well 25%	7	4	7	18
Tank 50% , Well 50%	10	8	9	27
Tank 25% , Well 75%	8	16	8	32
100% Well	3	17	6	26
Total	86	150	66	302

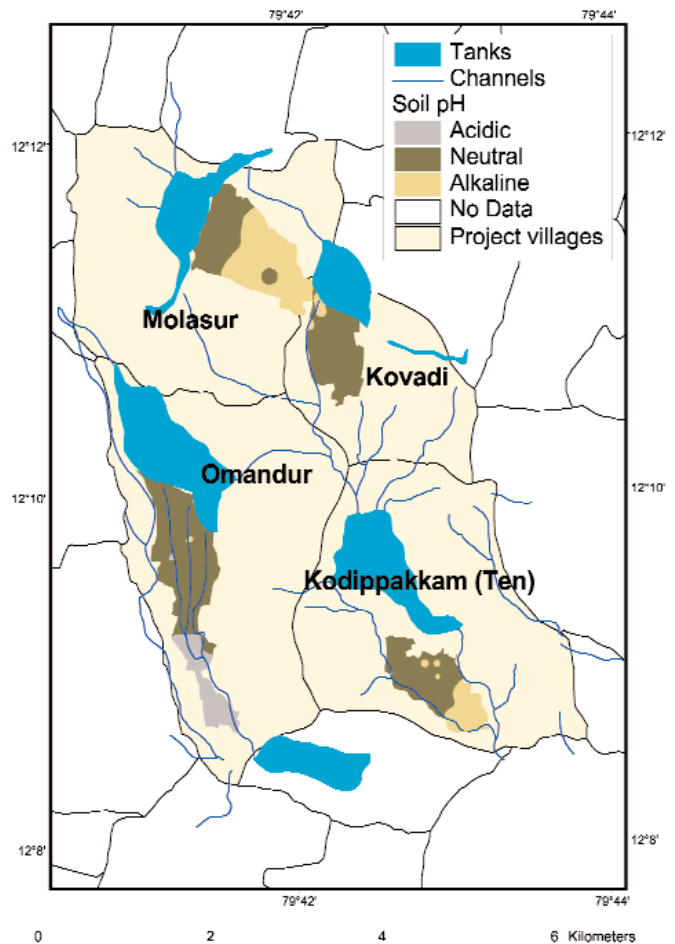
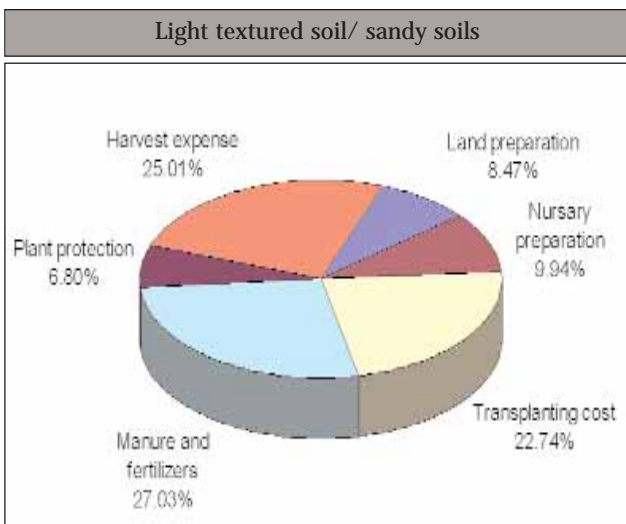
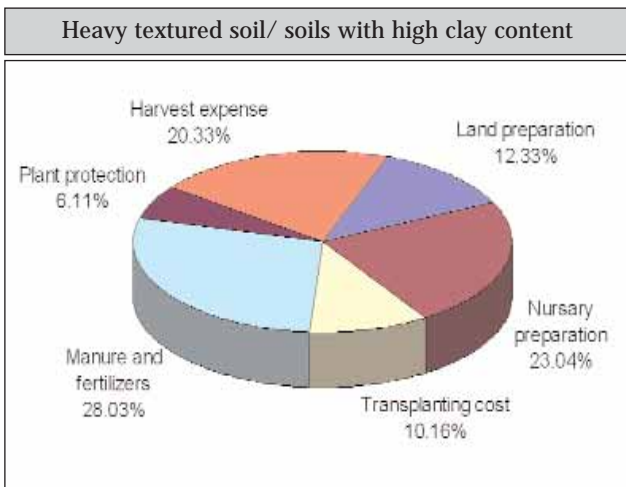


6. The 9 fold classification as developed by the revenue department classifies village area into the following categories - Forest land, Barren & uncultivable land, Land put to non-agricultural use, Cultivable wasteland, Permanent pasture and other grazing land, Land under miscellaneous tree crops, Current fallow land, Other fallow, Net area sown.

Soil Quality Assessment

The importance of soil quality and its proper management in crop choice, judicious water use and enhanced agricultural productivity cannot be neglected. The initial phase of the project saw extensive soil quality assessment throughout the project area. Major nutrients were tested for - Nitrogen, Phosphorous, Potassium, Organic Matter. A key finding has been that soils throughout the project area are deficient in Nitrogen, an essential nutrient that determines productivity. Subsequently, sixty-five farmer fields from two villages were monitored for soil conditions, before and after cropping and the fertilizer being applied. Soil fertility improvement practices followed by farmers however had little to do with the quality of their soils. Yet, around 30% of their investment in crop production was spent on fertility management. Intensive soil sampling was also carried out in the command areas of all tanks for both micro and macro nutrients.

Sampling for general soil quality was done across 62 villages with 263 samples being analysed. Of these, 49.43% samples were from paddy fields and 21.67% from fields growing groundnut, the two major crops in the area. Nitrogen availability ranged from 19.3 to 385 kg/ha. with only xx% being in the medium category and all the rest in the low availability category of less than 280 kg/ha. Phosphorous ranged from 0.44 to 63 kg/ha. with xx % of samples in the high availability category of more than 22kg/ha. Potassium fluctuated between 2 to 910 kg/ha with samples being distributed in all three availability categories; low, medium and high. The detailed farmer surveys and soil analysis of these fields showed that while fertiliser application followed standard application practices, this did not take into account actual field conditions. Thus, substantial investment on fertility management did not result in high yields. The average yield for the project area was 1880 kg of paddy per acre as against a national average of 2900 kg. Additional testing specific to command areas was carried out for micronutrients. Of the 566 samples, copper was not deficient, zinc deficient in 59% of samples and others were within acceptable levels.

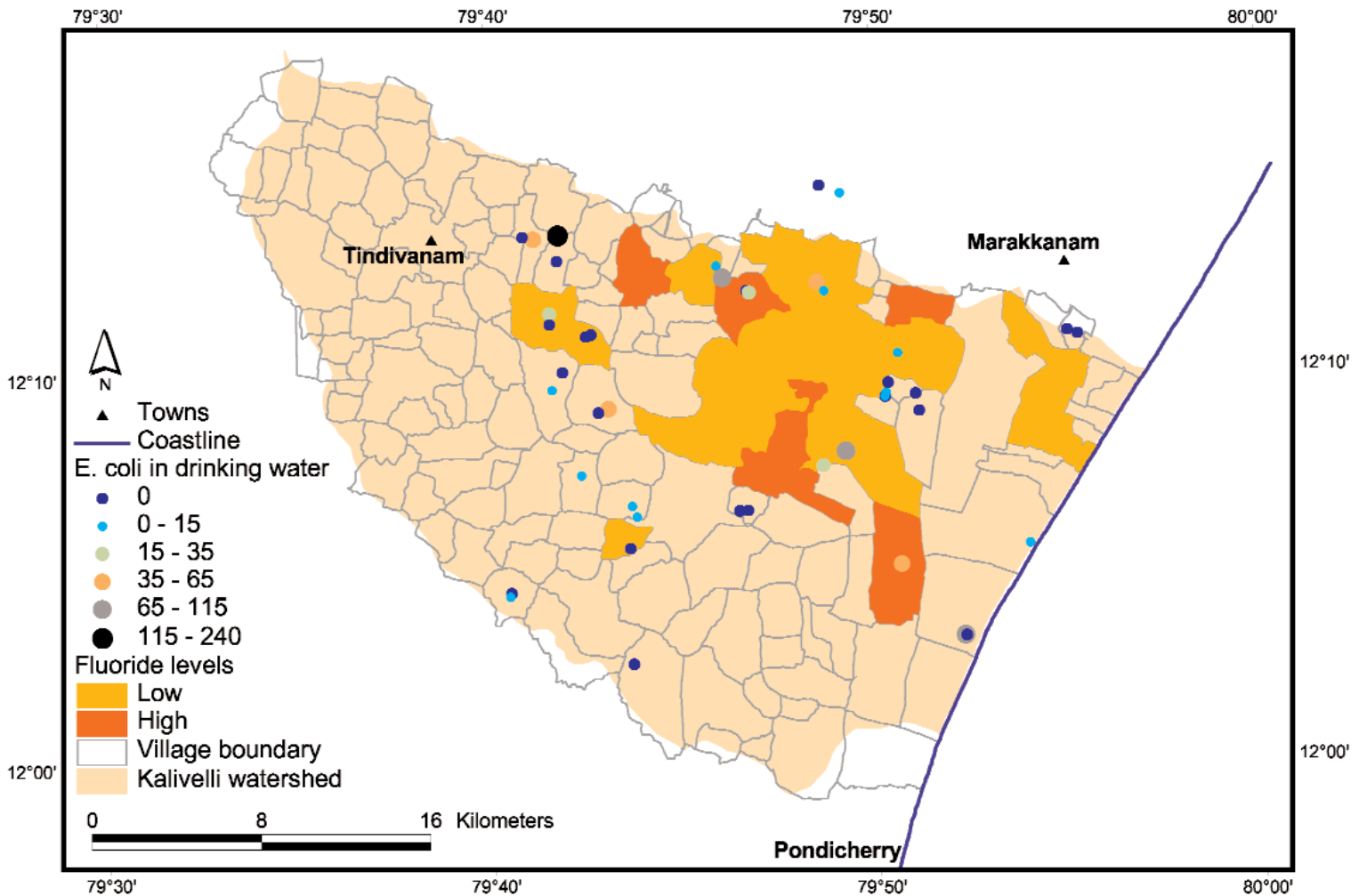


Water Quality Assessment

High salinity levels in ground water over the project area has been a major concern. Thus physico-chemical characteristics of ground water in the project area was studied to establish the current status and trends in water quality in the region. Over a period of four years, 1323 samples were analysed for 13 parameters as prescribed by the Indian Standards Institute. Results indicate that the salinity problem is not limited to the coast but extends further inland, suggesting that some areas with high salinity levels could be due to over exploitation of ground water or prevailing bedrock. The range in salinity levels was large and 25% of the samples had high salinity levels. Also drinking water quality was generally poorer than irrigation water and high fluoride levels was found in 36 villages which is of particular concern.

► Systematic and detailed data collation and analysis can highlight problems not given enough attention. On the flip side, assumptions made may be challenged.

Water samples were collected from open and bore wells as well as hand pumps over 7 rounds in pre and post monsoon seasons. The results showed a high amount of violations when compared with ISI standards. A violation is described as a non-conformity with acceptable levels for water quality. The main findings pertain to high levels of fluoride and electric conductivity in samples. Fluoride violations in drinking water represent a serious health risk. In addition, 50% of the wells tested for E.coli had unacceptable levels present. The belief that salinity intrusion is occurring is widespread and the high EC levels suggest high levels of salts in the water. This would generally be considered to be from the sea but violations of chlorides and sodium were few. The key source of conductivity would thus be metal salts which is borne out by regular violations in calcium, magnesium and flouride. Additionally, high salinity areas were also found substantial distances away from the coast as well as low salinity along the coast. Thus, evidence for salinity intrusion is limited at best in the project area.



- ▶ Questionnaire surveys
- ▶ Demonstration plots
- ▶ PRA
- ▶ GPS Mapping and GIS analysis
- ▶ Interviews

The project tried to address several issues revolving around optimal resource use and the trade offs between equity and efficiency. For example as benefits other than tank water should be accessible to a wider section of the village community and also managed sensibly. Other resources should be tapped and channelled towards an overall improvement in livelihood activities.

All these issues were inextricably linked with the activities taken up by the WUAs, WPGs and SHGs formed in the area. Within this general framework, we looked at some issues in detail.

Agriculture Extension

At present paddy is the major crop followed by groundnut in the ayacut through out the project area. A detailed survey of farming practices in these two crops was carried out. The results show that farmer's investment in fertilizer and pest protection are high but these are not based on concurrent field situation. They generally follow past management

Resource Use and Opportunities

Irrigation management activities generally focus on ensuring irrigation. However, benefits cannot be fully realised if general productivity remains low. While need for proper fertility management is common knowledge, its application leaves a lot to be desired. Initial surveys showed that fertility management was poor and average productivity of paddy fields low.

A data mining technique (recursive partitioning) was used to understand the complex relationship of different fertilizer application and yields. The results identified fields with higher nitrogen availability and application with higher yields. These fields also had moderate phosphate availability and intermediate levels of application. Potassium application had only a minor impact on yields.

practices. An experimental plot along with farmers was setup in Kaylamedu to demonstrate better farming practices, nutrient and water management for paddy. Results from this showed a strong increase in yield with availability and application of higher levels of nitrogen. It also showed that phosphorous was being over applied in some low nutrient conditions and was associated with lower yields.

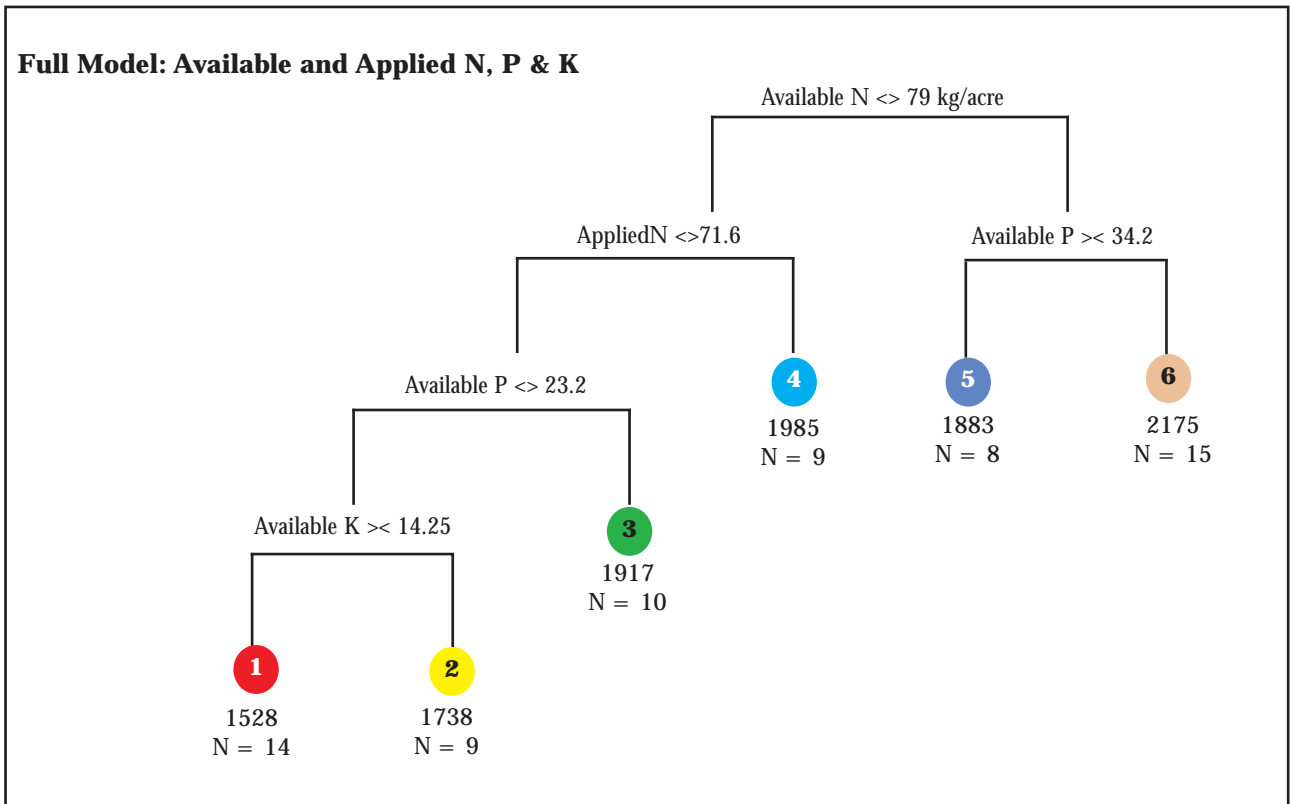
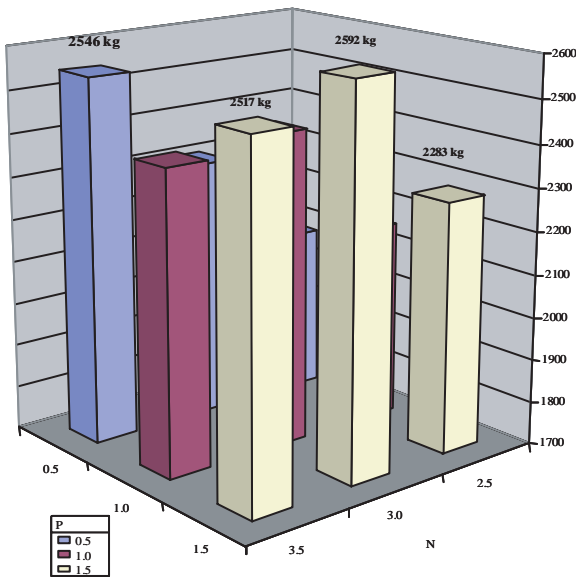


Figure 10: Pruned Regression Tree Model for both Available and Applied N, P, & K: The pruned tree represents subsets of the data that lead to significant increase in the model fit (here a linear regression of the dummy split variable on the rice yields in the subset). The pruned tree removes marginally significant splits, the un-pruned tree leaves them in. In this tree the highest yield subgroup (group 6) were fields with available N greater that 79 kg/acre and available P less than 34.2 kg/acre. The lowest yield subgroup (group 1) were fields with available N less than 79 kg/acre applied N less than 71.6 kg/acre, available P < 23 kg/acre, and applied K greater than 14 kg/acre.

Average Rice Yields in Kilograms by Nitrogen and Phosphorus



The Tamil Nadu Department of Agriculture fertiliser application recommendation is 2N:1P:1K which was revised to 3:1:1 during the project period. Field trials in 62 plots in 12 villages were conducted with different ratios of fertiliser application to find 'optimal mixes' that maximised profit and yield. Maximum yield of 2592kg per acre were obtained with 3N:1.5P:1K i.e. 8 bags of paddy more than the average seen in the project area.

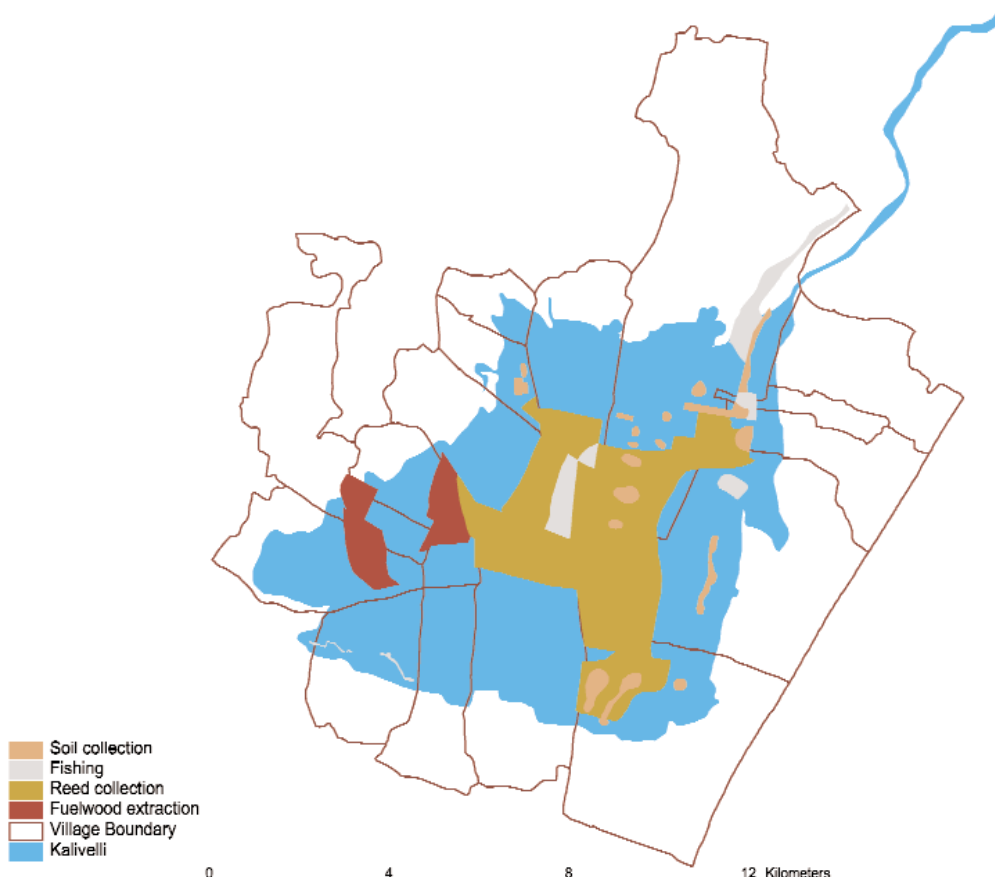
Data mining techniques helped find optimal fertiliser mixes which were confirmed by field trails. More importantly, this field trail showed that a monitoring and feedback process can increase yields by 25% over standard recommendation.

It further suggests that extension work needs to be locale specific and build local capacities for the same.

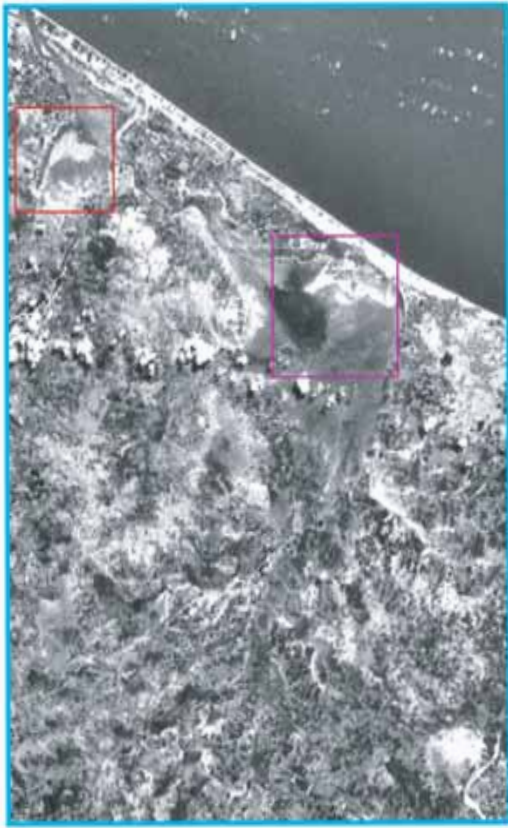
Resource use in the Kalivelli wetlands

The highlight of the Kalivelli watershed is the Kalivelli wetland, one of the largest wetlands in peninsular India. It is also an important wintering habitat for thousands of migratory birds. The 16 villages around the tank were surveyed for resource use and management practices. They are primarily dependent on agriculture and have large livestock populations. The tank forms the main grazing ground, in the summer months when the waters recede. We estimated approx. 17,000 heads of cattle and another 15,000 goats. The dry parts of the tank also serve as seasonal agricultural land, wherein encroachments are common. Reed collection occurs on a large scale in 10 villages during the months of February to May. Fishing provided a major source of income mainly in the months of October to January. At the mouth of the estuary is a large salt industry. The numbers of shrimp farms in the area are constantly on the rise.

Resource access, amounts extracted and used is not restricted in any formal sense other than informal boundaries being respected. In the case of reeds "outsiders" are not allowed to harvest in a few villages. Resource utilisation in the lake thus ranges from low impact activities such as basket fishing to large scale modifications in and around the bed for shrimp farming and salt pans. However, there is very little documentation either on the bird populations, habitat quality or the influence of human settlements in the region. One of the recommendations of the study is an immediate systematic study to assess the various factors influencing the habitat status of the Kalivelli wetlands. Only then can the ecological goods and services provided by the wetlands be ascertained and management issues for the area addressed.



Changes in the Kalivelli-Yedayanthittu Wetland Complex 1979-2001



The satellite imagery presented here shows a somewhat clear picture that the wetland has been reduced in size. It also clearly shows that encroachments are a major phenomenon in the northern section of the wetland. The environmental impacts of these land use changes is unclear.

Opportunities harnessed for IGPs

The women SHGs and Puttadaar groups have identified and carried out a range of income generation activities. The activities span the spectrum of agriculture associated, animal husbandry, small scale enterprises and handicrafts. Some of these activities (eg. agarbathi, garment knitting) requiring specific training and marketing skills have had varied successes. Others have focussed on locally available resources and known skills (and sometimes acquired)- fisheries, brick kilns, keeth (coconut thatch) knitting and lease of land for agriculture. Women have also successfully ventured into 'non-traditional' activities - renting out paddy threshing machines, selling salt on a bullock cart or setting up a piggery. The capacities built and confidence gained by the women in taking up these activities has been enormous. The main gains expressed by them other than the economic benefits are, the ability to move around and meet different people, better access to credit and relief from crippling debt situations which enables them to better educate their children, invest in agriculture or household enterprises and the overall change in attitude of men in their villages.

Kind of Activities	
Agriculture	36.08 %
Cattle rearing	22.68 %
Business	10.31 %
Tailoring	4.12 %
Keeth knitting	3.09 %
Charcoal making	2.06 %
Bought cart	1.03 %
Cart repaired	1.03 %
NA	19.59 %

Percentage of income generation activities taken up by SHG members from financial assistance received from govt. schemes

Before, we used to borrow from moneylenders for agricultural expenses. Mortgaging jewels and vessels was usual. Now, we have started credit groups and borrow at lower interests. We save and moreover, the interest that we have to pay, comes back to us. There is no need for mortgaging now. Previously, we were mere prisoners at home. Now, we have got the opportunity to meet and interact with big officials from the bank and other agencies. We also participate in several training programs. There has been a significant transformation amongst us, socially.

- Women's Voices

▶ Adaptive management approaches result in substantial difference to overall productivity.

▶ Training and capacity building not only improves resource utilisation and management, but also impacts social capabilities and capital.



- ▶ Meteorological monitoring
- ▶ GPS mapping
- ▶ Water availability in tanks (staff guage)
- ▶ Water discharge (trapezoid notch)
- ▶ Silt traps to measure sedimentation rates
- ▶ GPS mapping
- ▶ Satellite image analysis
- ▶ Modelling and GIS

Basic Hydrology and the impacts of rehabilitation work

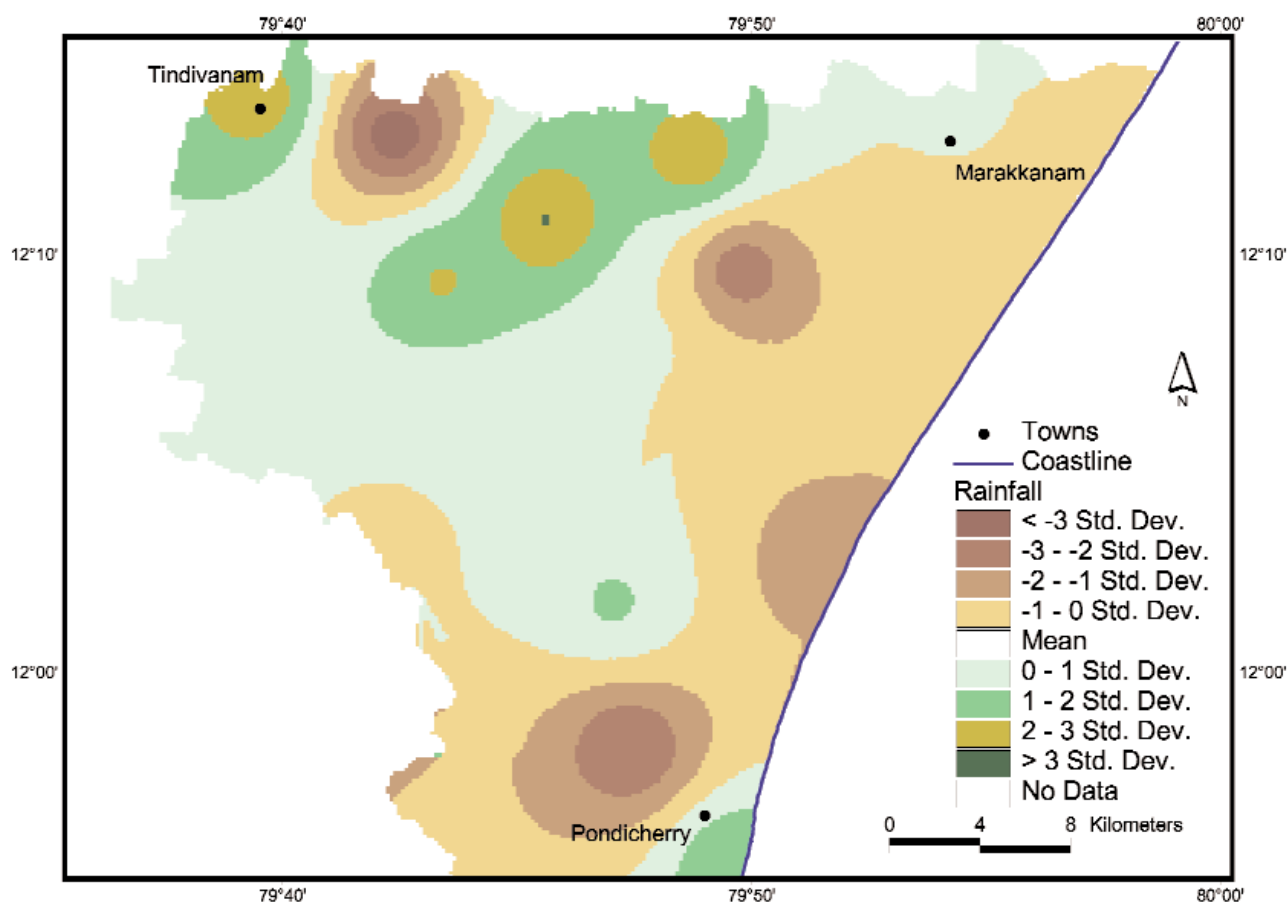
Mapping

Starting with collation of published maps, analysis of satellite imageries was carried out to identify catchment areas and their characteristics. This can be important baseline information to determine changes in the catchments of the MITs over the years. Maps produced included drainage patterns, vegetation cover and elevation. These showed that much of the catchment area around the MITs was badly denuded. The information was utilised to help prepare a watershed development project in the region, which is currently being implemented by Palmyra.

Meteorological data

Areas such as the Kalivelli watershed receive most of their rainfall in less than a fortnight of rainy days. Given that our monsoon consists of convectional rain caused by low pressure in the Bay of Bengal, rainfall can be highly variable between micro-catchments. We tried to capture some of this variance by setting up 15 meteorological stations each 5km apart across the project area. A comparison between the different stations showed that there was a high variance between the rainfall received. This explained how neighbouring villages could have very different water levels at the end of the monsoon.

Project implementation revolved around substantial work being carried out to rehabilitate and increase the efficiencies of the tank systems. Thus, monitoring issues arising from the harvesting and distribution of water were a major thrust of FERAL's component. We took up four basic areas of monitoring. On the mapping front, we collected field survey data, collated and digitised many baseline maps and analysed a range of satellite imageries to generate what is clearly the largest geo-spatial data base of the Kalivelli region. This served as a basis for a range of thematic maps which have been presented below. In terms of meteorological data, we collected various atmospheric parameters through volunteers (including school children), village animators and other project staff. FERAL measured silt inflows and also water harvested in tanks using simple devices. Silt traps were laid at the mouths of various inlet channels and a calibrated staff guage was placed near the sluices of all tanks. Finally, we monitored cropping patterns and areas irrigated in the command areas of tanks. This was done using GPS units and historical data was collected using PRA based mapping techniques. The sections below briefly describe these activities and provide examples of the outputs which formed part of our monitoring support for the project.

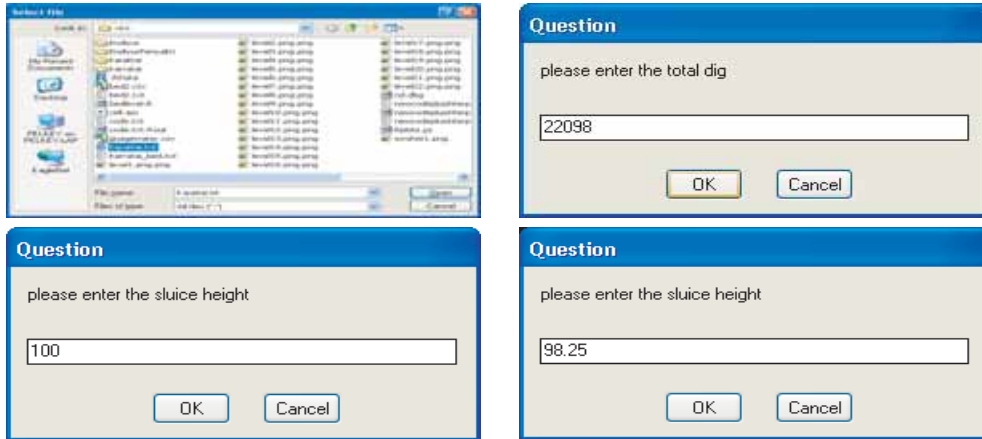


Water harvesting

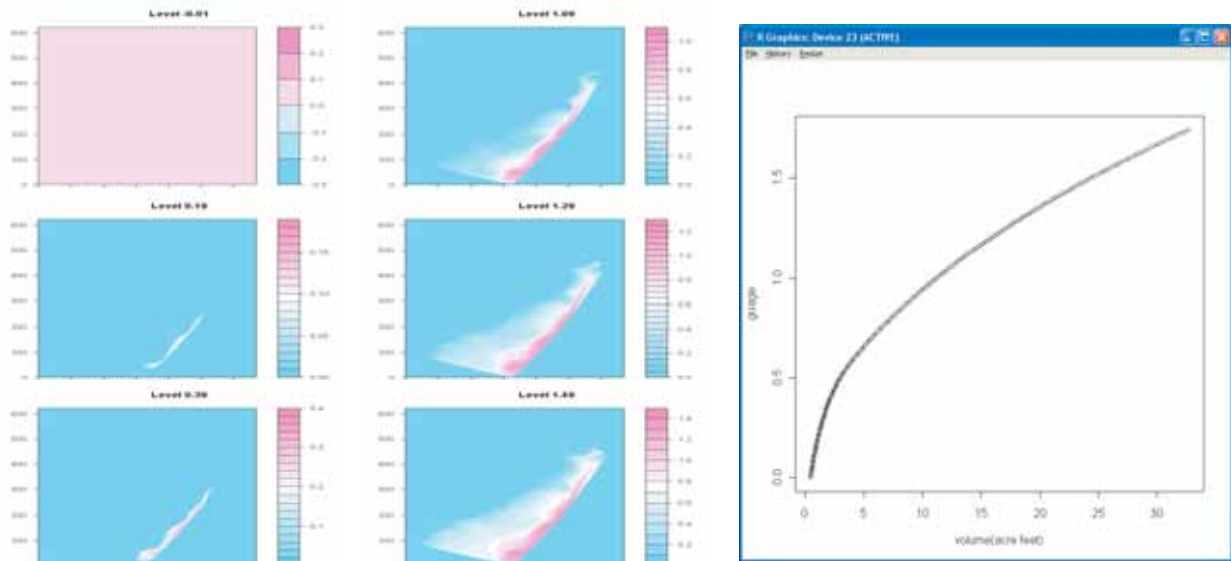
Physical interventions taken up by the project concentrated on three major areas, namely; restoration of drainage channels, water control structures (bunds, sluices and weirs) and distribution channels and boxes. To facilitate farmers to know the level of water in their tanks, staff gauges were installed at the mouths of sluices in all tanks. FERAL took

this a step further and using available data, simulated days of water availability given heights of water on scale bars. This was done using a combination of GIS and surface modelling. While we need to increase storage capacity, improved flows and repairs of other structures did seem to play an important role in increased water harvesting.

 **The Easy User Interface**



The Pretty Output and Useful Information



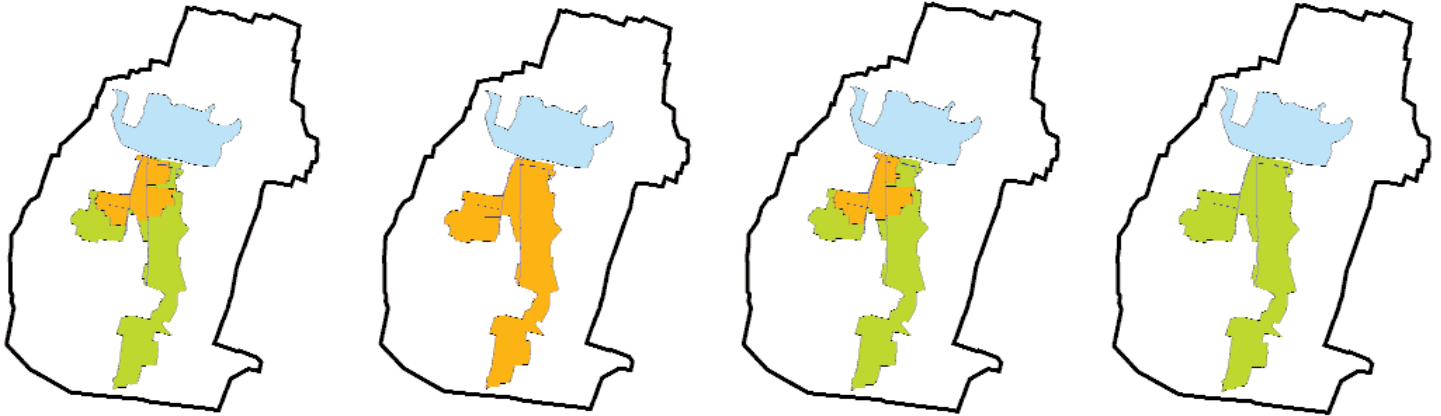
Gauge	Cubic Meters	Acre Feet	Million Cubic Feet
1.74	40272.40	32.65	1.422
1.64	35842.94	29.06	1.266
1.54	31677.18	25.68	1.119
1.44	27800.55	22.54	0.982
1.34	24207.76	19.63	0.855
1.24	20867.45	16.92	0.737
1.14	17760.10	14.40	0.627
1.04	14924.56	12.10	0.527
0.94	12364.45	10.02	0.437
0.84	10011.34	8.12	0.354
0.74	7861.84	6.37	0.278
0.64	5937.72	4.81	0.210
0.54	4279.14	3.47	0.151
0.44	3063.73	2.48	0.108
0.34	2231.41	1.81	0.079
0.24	1596.69	1.29	0.056
0.14	1101.35	0.89	0.039
0.04	718.24	0.58	0.025
0	590.09	0.48	0.021

► Periodic assessment helps understand relation of benefits derived from different activities and their relation to the overall project goals.

► Technological applications can be used appropriately to substantially improve decision making and planning in participatory resource management efforts.

Water use for irrigation

We tried to measure both the out-flows of water in 25 villages and the areas irrigated in the various command areas. The former involved setting up of flumes near the sluice gates of the tanks. These were calibrated and measured twice a day⁷. GPS units were put into use to map cropped area each season. This allowed us to monitor differences in cropped area across the years.



Total Ayacut Extent - 150 ac

Before TR – Season 1 (2000)
Cropped area - 41 ac
27.33 % of the Ayacut

AfterTR – Season 1 (2001 - 2002)
Cropped area - 150 ac
100 % of the Ayacut

AfterTR – Season 2 (2001 - 2002)
Cropped area - 39 ac
26 % of the Ayacut

AfterTR – Season 1 (2002 - 2003)
Cropped area - Nil
Because of Monsoon Failure



7. Experiments for this were carried out under an independent Department of Science and Technology funded programme.

Effective functioning of Community Based Organisations

While formation of CBOs is not an issue, ensuring that they grow and function as effective and efficient bodies requires substantial amounts of capacity building and mentoring. One also needs to constantly keep track of where they stand and identify their changing needs or in other words enable adaptive resource management to occur effectively. This requires not only the project managers inputs but also needs active involvement of the communities themselves. The goals of the CBOs initiated in this project were different - rehabilitation of the MITS for the farmers while micro-credit and economic activities for the women. Over this period we have utilised several techniques to track the strengths, weaknesses and functional capacities developed by these groups.

The main focus for the SHGs was to generate sufficient financial reserves to help them become self-reliant and improve their capacities and skills. The assessment focussed on the extent to which these objectives had been met. The success of these groups has been measured across various dimensions including organizational difficulties, financial success and perceptions regarding implementation of income generating activities. The key financial indicators of this success were total savings, savings rate, total loans, and percent loan repayment. The key social indicators were number of meetings, turnout, conflict management and involvement in village level activities. The key output indicator was the number of income generating activities taken up by these groups.

The WUAs were more difficult to assess as their period of activity fluctuated in accordance to the level of physical activities in the tank. Further more, focus was on mobilising financial resources as compared to developing their organisational capacities. As the WUAs matured, focus shifted more to aspects of future maintenance, efficient water distribution and the co-ordinated functioning required between the members. The benefits enjoyed after initial rehabilitation activities also motivated farmers in participating more effectively in their Associations.

Participatory Assessment

During the last phase of the project, a participatory assessment of the functioning and potential sustainability of the CBOs was conducted. The different stakeholders were involved in both identifying the parameters to be assessed and also the assessment itself. An evaluation committee comprising of project staff, farmers and women ranked the groups. This exercise helped in raising awareness of several functional issues as well as identified areas requiring focus from project managers. The objective of this exercise was twofold. One, to develop an understanding of the need for a process of self-assessment and two, to get the farmers' and women's perceptions of what they considered to be a 'well functioning organisation'. A final and longer term objective was to initiate the discussions and debate around the sus-

- ▶ Register checking
- ▶ Attending meetings as observers
- ▶ Questionnaire surveys
- ▶ Participatory assessment
- ▶ Group discussions
- ▶ Structured interviews

tainability of these organisations and the roles that they could play.

The assessment of the SHGs showed that the groups gave primary importance to the level of mutual understanding and linkages developed with the various government institutions which are extending support to their activities. This is also reflected in the several village development and entrepreneurial activities taken up by them. The WUA results showed the level of maturity reached on basic organisational issues and their focus for future management.

*Average scores across categories - WUA
(20 Associations)*

Parameter Categories	Average Score
Financial	2.69
Institutional	3.12
Record Keeping	2.38
Water Management	3.05
Linkages	2.29
Functional	3.04
Gender Issues	2.96

*Average scores across categories - SHG
(44 groups)*

Parameter Categories	Average Score
Financial	3.94
Institutional	4.01
Functional	3.79
Linkages	2.83
IGP	3.2

- ▶ Participatory assessments provide support to institutional building and strengthening through the direct involvement of communities.

Community management of local resources is seen as a key to improved social and environmental conditions. However, identifying the characteristics which ensure the sustainability of the CBOs, their performance as democratic and equitable institutions and as managers and implementers of programmes is not so straight forward. Participatory assessments are a step towards members of CBOs internalising the process of monitoring themselves and thereby improve their functioning and planning. These exercises, done periodically, can help CBOs focus on their goals and chart out their course of future action.

Assessment moved from the initial observer and questionnaire methods to the use of participatory techniques. A two step process was followed where WUA and SHG members identified parameters and gave importance rankings on a scale of 1 to 5. Subsequently a committee was formed of members and project staff which evaluated WUAs and SHGs separately.

General observations

- ▶ Issues of co-ordinated functioning, management of financial resources and organisational strengthening were common across groups.
- ▶ Better water management was specific to farmers while establishing links with the local government departments for training and accessing funds for income generation activities was specific to the women groups.

- ▶ The small size and clear organisational cum activity structure provided by the Tamil Nadu Corporation for Development of Women as well as immediate benefits enjoyed ensured better participation of women.

- ▶ Focus for the WUAs, a much larger group, was initially more on mobilising financial resources for rehabilitation of tanks as compared to strengthening the organisation.

- ▶ Sharing of experiences and strategies across groups was a major by product of these exercises.

Analysis

- ▶ Score of above 70 out of 100 by 2 WUAs , 13 associations (60%) scoring between 50 and 70.

- ▶ 86% of the SHGs scored above 60 with 11 of these scoring above 80 out of 100.

- ▶ Average score on parameter categories between 2.29 and 3.12 for WUAs and 2.8 and 4 for SHGs on a scale of 1 to 5.

- ▶ Factor analysis of farmers responses resulted in grouping of parameters across four main categories: Financial, Institutional, Water and Project Management.

Decision Support Systems and the project

Decision Support System is a tool to help project managers and other stakeholders make informed decisions regarding project activities. It helps tie together different pieces of information and also in understanding the relationships between these. Thus planning of activities, target achievement or performance levels, comparisons of before - after scenarios and impact assessment become part of an integrated system. However, such systems are dependent on quality and regularity of data as well as the ability of project staff to see it as a means of enhancing performance rather than for the purpose of individual assessment

The use of GIS and relational databases for organising and displaying information was one of the unique features of the ICEF project. FERAL used its existing expertise in GIS and field methods to develop a spatial decision support system which covered all major aspects of monitoring and planning. Thus all data collected was digitised, and geo-coded, be it performance of staff or CBOs or satellite imageries for land cover. We used simple database front ends and spreadsheets for data entry and queries. Reports from the system were largely in the form of maps and tables.

Mapping

Among the several maps prepared for planning and analysis were

- ▶ Village level maps for micro planning which included information from PRA exercises, satellite imageries, watershed maps, cadastral maps and field surveys using GPS units and levels.
- ▶ Baseline and change maps of water quality and soil using soil and water quality surveys/analysis combined with GPS readings of the sites.

- ▶ Register checking
- ▶ Attending meetings as observers
- ▶ Questionnaire surveys
- ▶ Participatory assessment
- ▶ Group discussions
- ▶ Structured interviews

- ▶ Vegetation maps of the project area utilising remote sensing data, a combination of LISS and PAN was used to obtain higher resolutions than possible with LISS alone.
- ▶ 3-D elevation models of tanks based on existing field data along with a model that predicted storage (in acre feet) based on readings from staff gauges placed at the sluice gates.
- ▶ Cropped area maps which were based on field surveys during successive cropping seasons which demonstrated changes in cropped area prior to and after implementation activities.

Project Management

A constant monitoring to track activities of the project was set up through a system of a digital form to be filled by the staff once a week. The information which included activities planned, achieved and benchmarks of project progress, was stored in a relational database. The analysis of the data provided a powerful tool to follow up on targets and run review and planning exercises to assess the level of achievement and to redirect effort according to the spatial distribution or perceived needs by the staff. This in combination with results of CBO performance helped identify areas of concern. Once analysed these could be compared with the targets set out at the six monthly participatory planning sessions. This data was also transferred onto a GIS platform to get a visual representation of the spread of effort across the project area.

WEEKLY REPORTS - [Tank Rehabilitation : Form]

File Edit View Insert Format Records Tools Window Help

Tank Rehabilitation

Name:

Date:

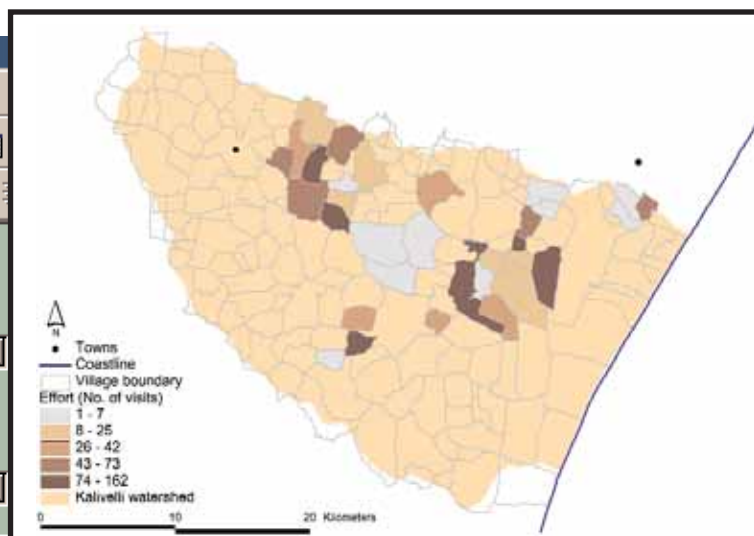
Location:

Activities Started

<input checked="" type="checkbox"/> Physical Survey, Initial	<input checked="" type="checkbox"/> Actual Work
<input checked="" type="checkbox"/> Physical Survey, Detailed	<input checked="" type="checkbox"/> S_W Conservation, Identify Plots
<input checked="" type="checkbox"/> Estimates, Primary	<input checked="" type="checkbox"/> S_W Conservation, Plantation
<input checked="" type="checkbox"/> Estimates, Detailed	<input checked="" type="checkbox"/> S_W Conservation, Nursery Raising

Activities Ongoing

<input checked="" type="checkbox"/> Actual Work	<input checked="" type="checkbox"/> S_W Conservation, Field Bunding
<input checked="" type="checkbox"/> S_W Conservation, Check Dams	<input checked="" type="checkbox"/> S_W Conservation, Nursery Raising
<input checked="" type="checkbox"/> S_W Conservation, Nursery Raising	<input checked="" type="checkbox"/> Post Implementation Survey

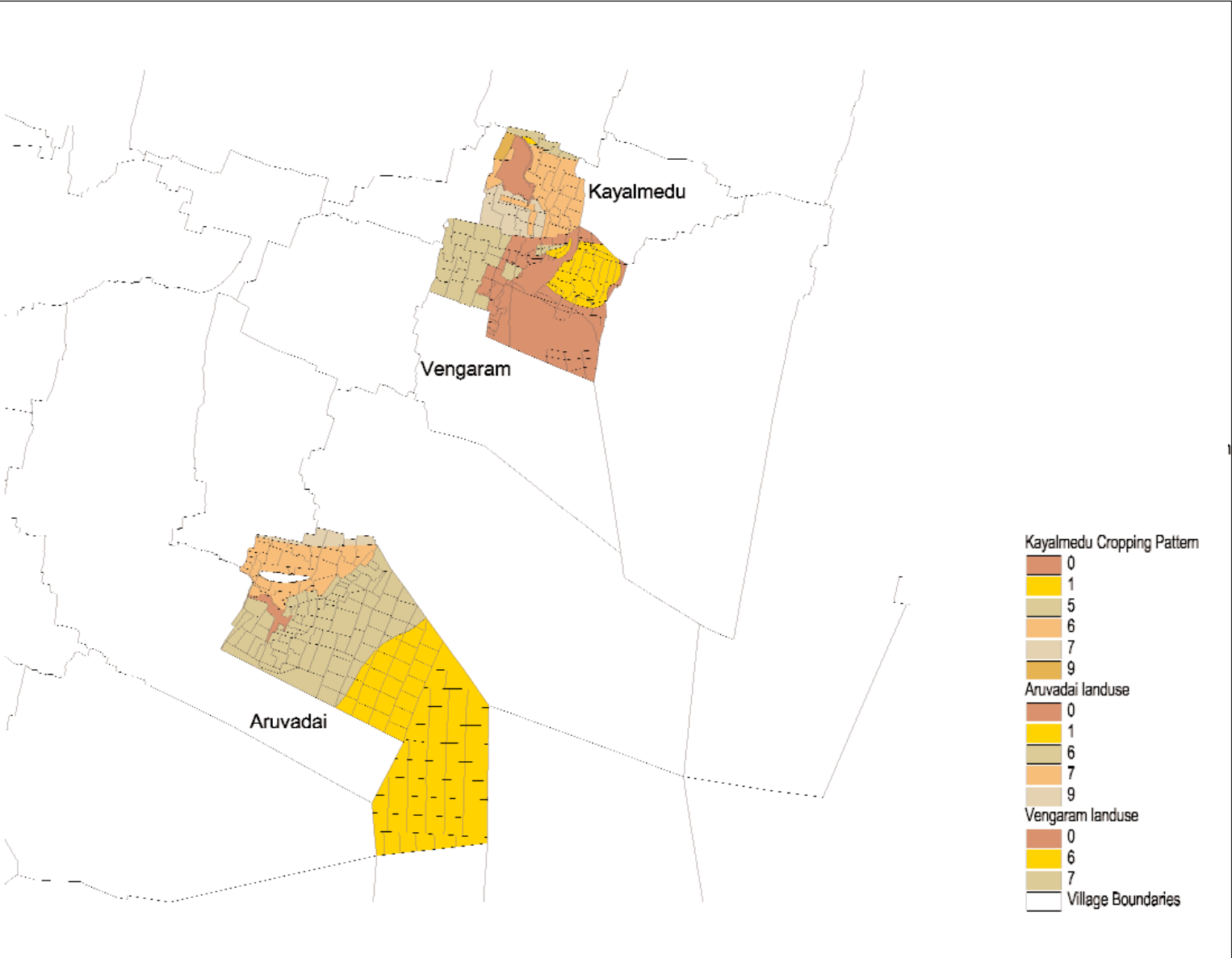


▶ Participatory assessments provide support to institutional building and strengthening through the direct involvement of communities.

The use of GIS technology also helps in the pooling of information from different sources (type, spatial and temporal) thereby increasing the power of analysis and understanding of a system. This combination of participatory methods and information technology is one of the major innovations of FERAL on this project. This has been put together as a training manual titled "Field Methods in Participatory GIS" and is an important component of our capacity building efforts for other organisations.

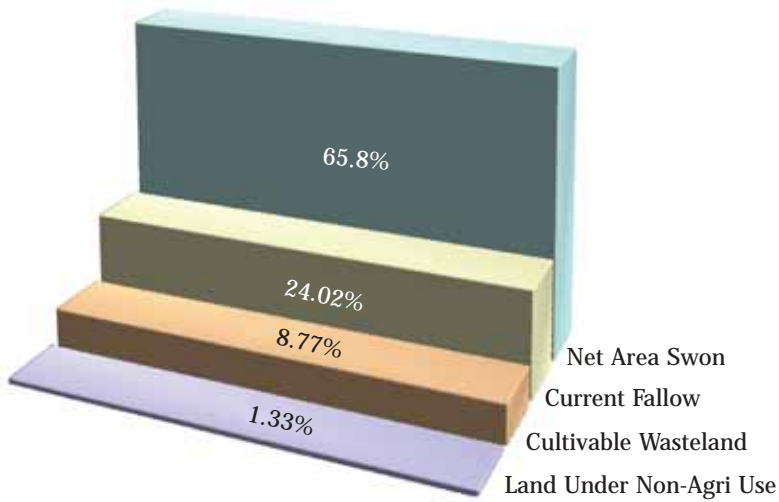
PRA - GIS Hybrids and Micro Planning

Participatory Rural Appraisals (PRAs) are seen as people-centred method for planning and data collection efforts. The key strengths of PRAs come from its low-tech and people-centered core. GIS is a "data centered" approach and is perceived as a high-end technology used and understood only by highly qualified or 'scientific' persons. The key strengths of GIS are that it can combine a wide variety of data into an analytic system that provide readily understandable and aesthetically pleasing outputs. The issue therefore is to take the timely and locally relevant PRA data and integrate it into a technically and economically feasible GIS.

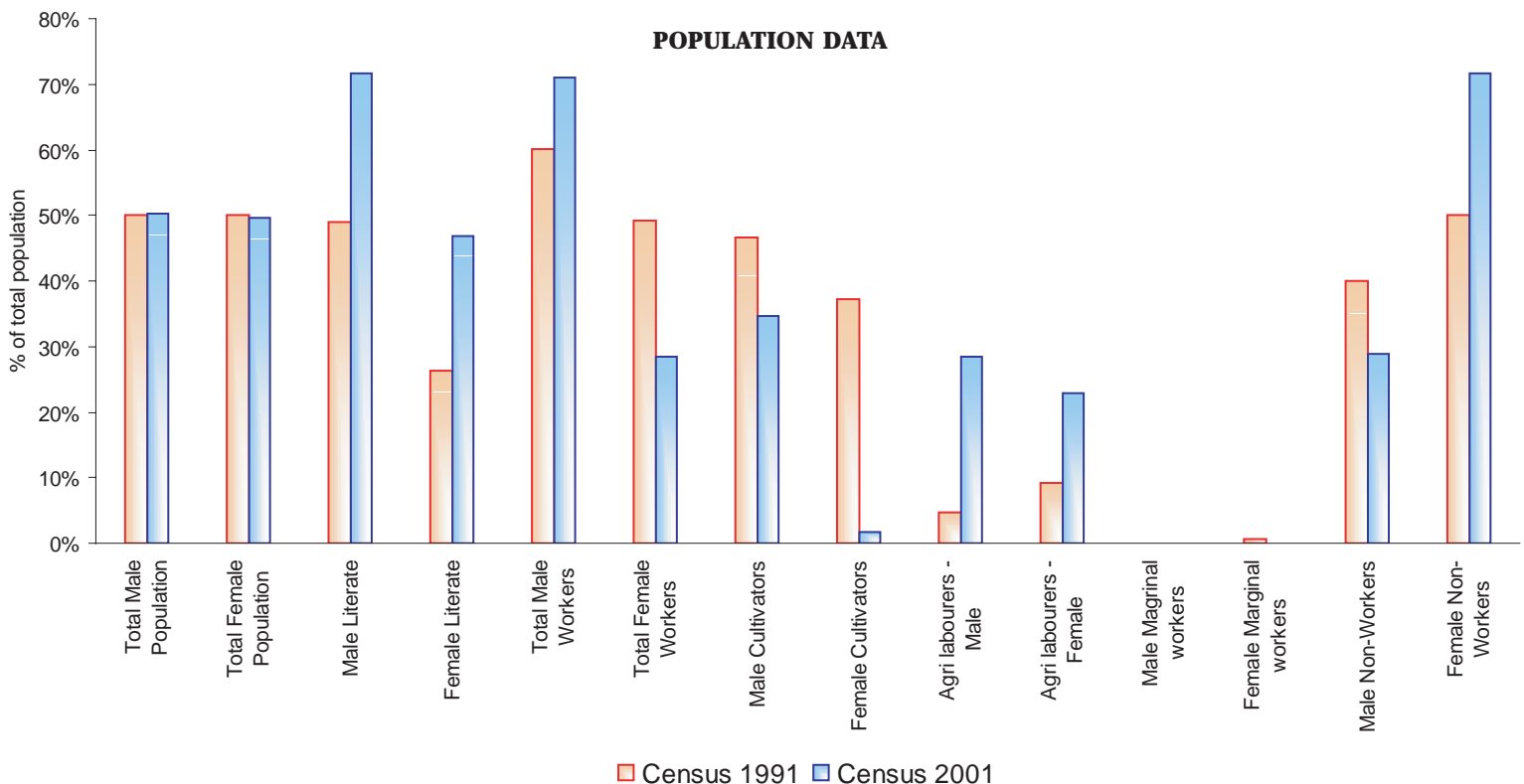


PART - II

Adavallikuttan



Though an Association was formed early on, rehabilitation activities started only much later. The Association has seen many ups and downs through this period. Contribution has been mobilised mainly through the common fund and basic activities of desilting and bund strengthening have been carried out.



WUA

Water Users' Association

Institutional	
Date of formation	03/10/2000
No of members	77
Total No of EC members	11
No women EC members	2
Total size of command	137.81

30%

Fund mobilization (in Rs)	
Individual Farmer's fund	4560.00
Village Common Fund	77540.00
30% contribution	92100.00
70% contribution	214900.00
Total funds raised	307000.00

Physical work 2003-04	
Desilting	6500m ³
Bund strengthening	870m
Jungle clearance	-
Supply channel	-
Distribution channel	-
Sectioning	870m
Construction	-
Increase in water capacity	0.23mcf

Farmer Profile	
> 1 acre	22
1 - 2.5 acres	36
> 2.5 acres	19

WSHG

Womens' Self Help Groups

Institutional	
Group name	Vizhipunarvo
No of members	20

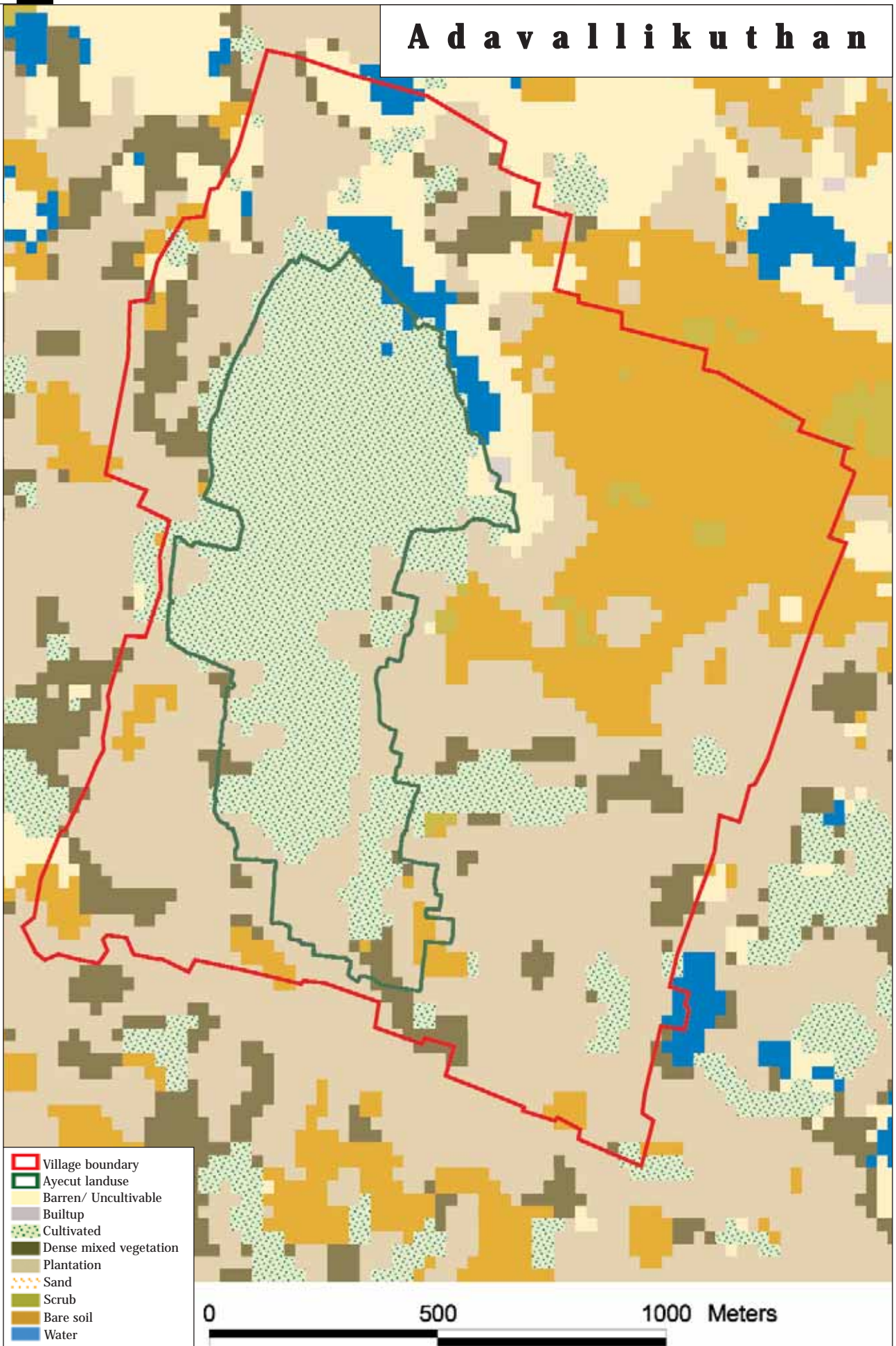
Financial (in Rs)	
Savings	32400.00
Loans	32550.00

Social activities	
Organised eye camp Kitchen garden and herbal medicine	

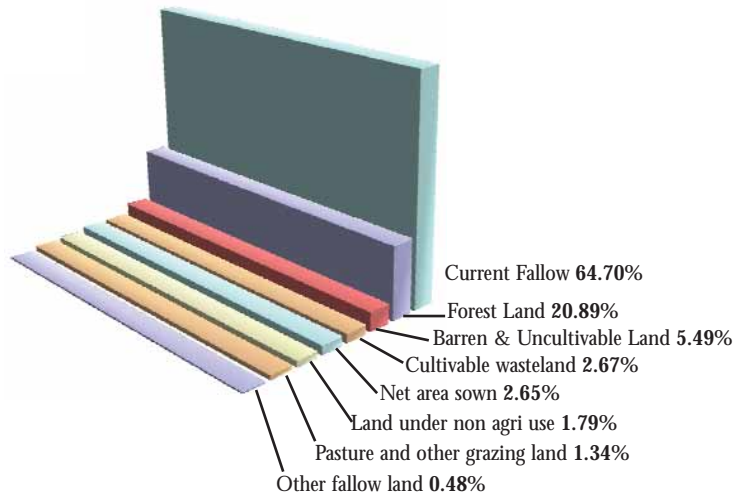
IGP	
	RF
Jointly	Goat
individual	Cattle



A d a v a l l i k u t h a n

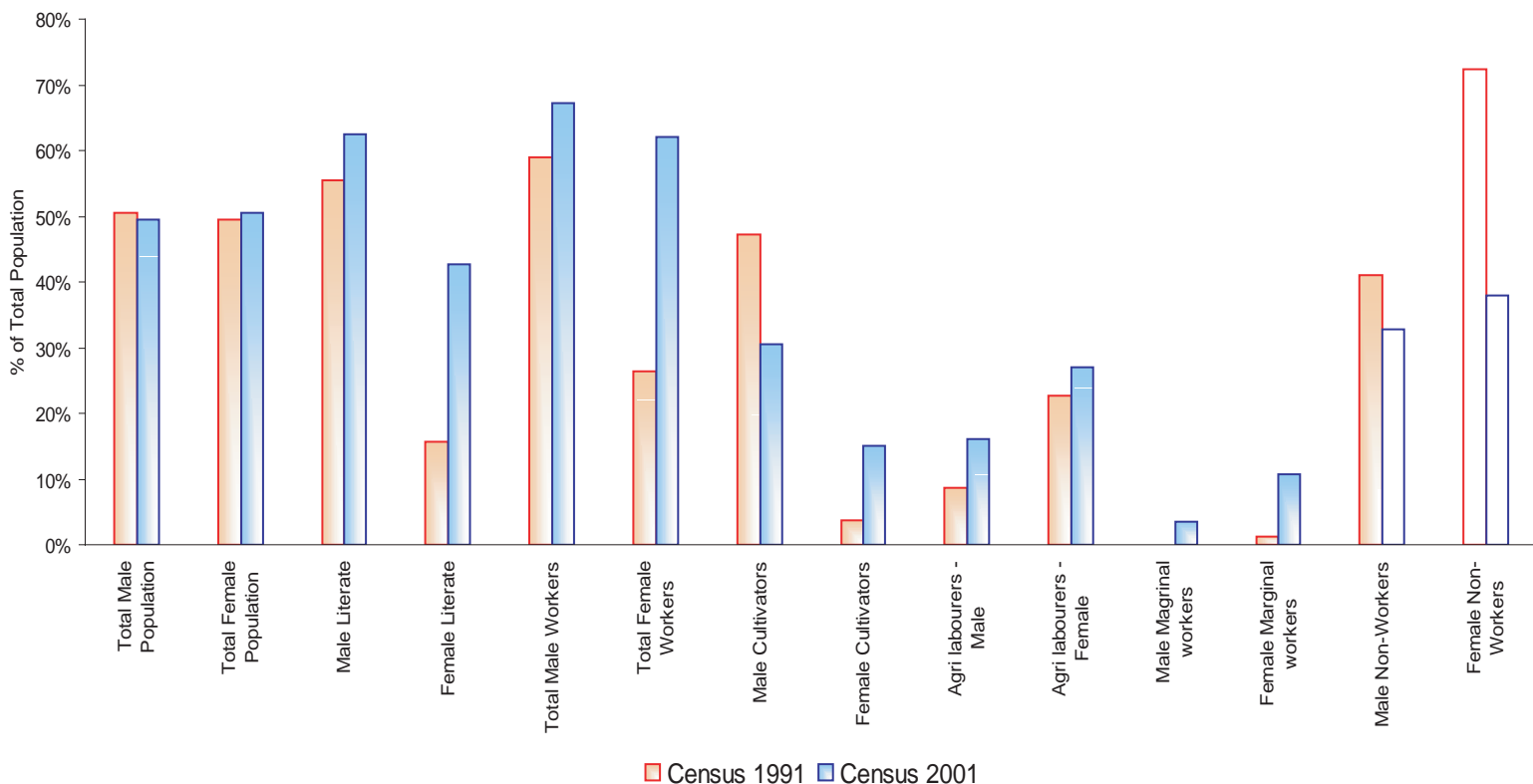


Alankuppam



Initial mobilisation efforts in the village were not successful as another agency was offering to work at only 10% contributions. This however did not take off even after a year. Subsequent work in a neighbouring village plus surveys conducted by FERAL helped re-initiate contact and interest in the project. Attendance at training programmes also helped swing the farmers' opinion. There has been substantial improvement after rehabilitation work and the entire command area now receives water for irrigation. The Association has also taken up fish culture within the tank which brings in revenue to the Association. The SHGs in the village have participated in plantation on the tank bunds. As SHG members, the women who were earlier ignored at village level meetings, are now being asked to participate along with the men in activities. The micro-credit initiative has helped the women ensure education for their children as well as reduce the burden of agricultural expenses.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	07/05/2001
No of members	133
Total No of EC members	11
No women EC members	2
Total size of command	254.01

Fund mobilization (in Rs)	
Individual Farmer's fund	63760.00
Village Common Fund	316240.00
30% contribution	380000.00
70% contribution	886666.67
Total funds raised	1266666.67

30%

Physical work 2003-04

	2001-02	2002-03	2003-04
Desilting	-	12150	3000m ³
Bund strengthening	-	1480m	-
Jungle clearance	22700m ²	2500m ²	-
Supply channel	10651m ³	1950m ³	-
Distribution channel	-	2300	-
Sectioning in m	2610m	2260m	-
Construction	-	Steps, sluice repair	
Increase in water capacity	-	0.16	0.11

Farmer Profile

> 1 acre	26
1 - 2.5 acres	90
> 2.5 acres	17

WSHG

Womens' Self Help Groups

Institutional		
Number of groups: 2		
Group name	Thendral	Kavikul
No of members	20	20
Date of formation	13/08/2001	25/08/2001

Financial (in Rs)

Savings	60505.00
Loans	32530.00

Social activities

Organised eye camp
Kitchen garden and herbal medicine
Plantation on tank bund

IGP

	RF
Jointly	Goat
individual	Cattle

WPG

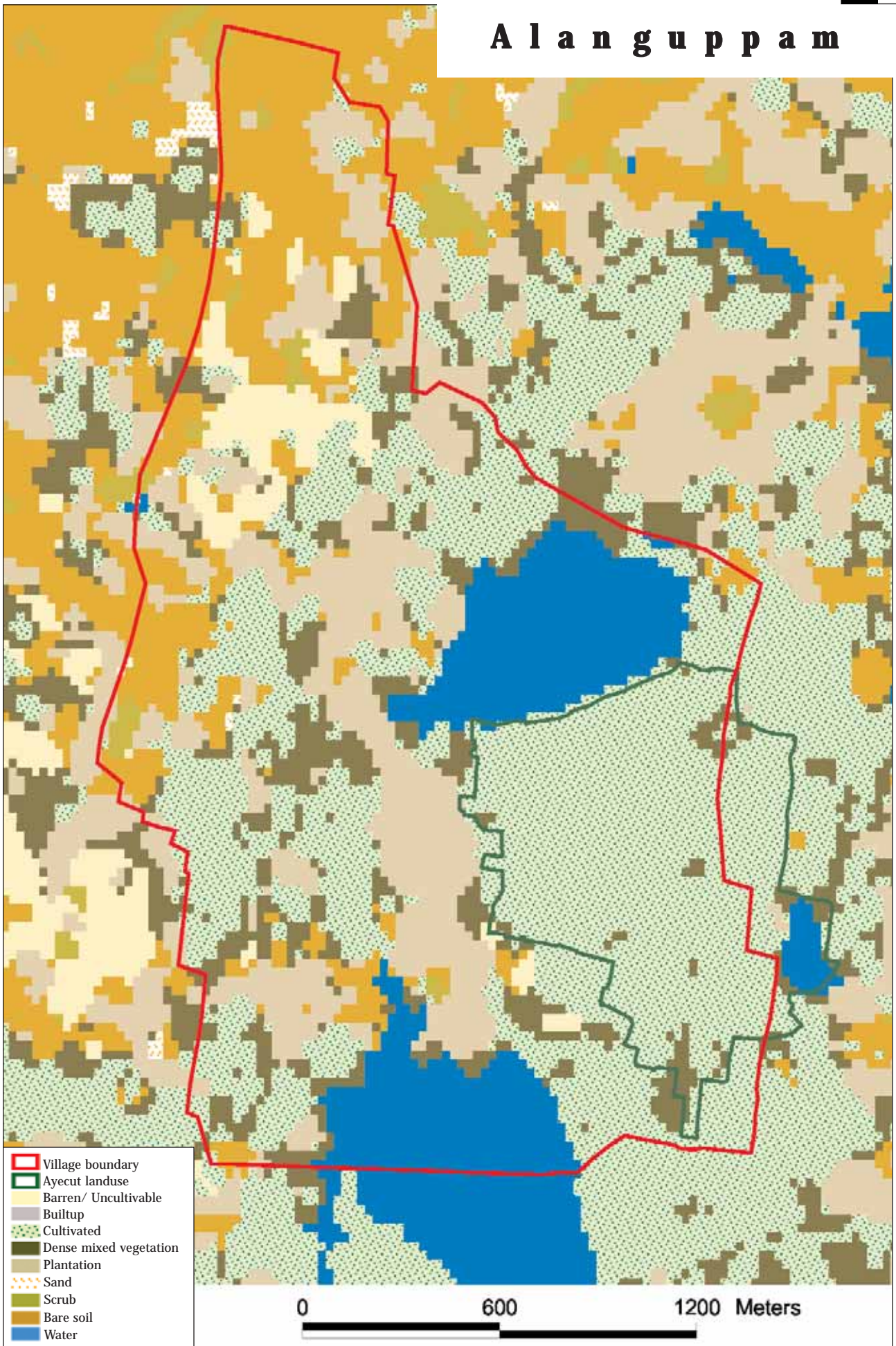
Women Puttadaar Groups

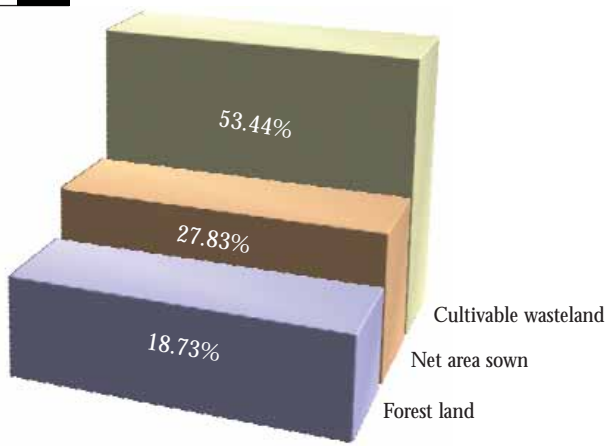
Institutional	
Group Name	Palaru
N° of members	15
No. of EC	1
No. of WP	3
Date of formation	23/09/2003
Savings loan	6000
Loan	2750

IGP

Panchakaviyam foliar spray

A l a n g u p p a m



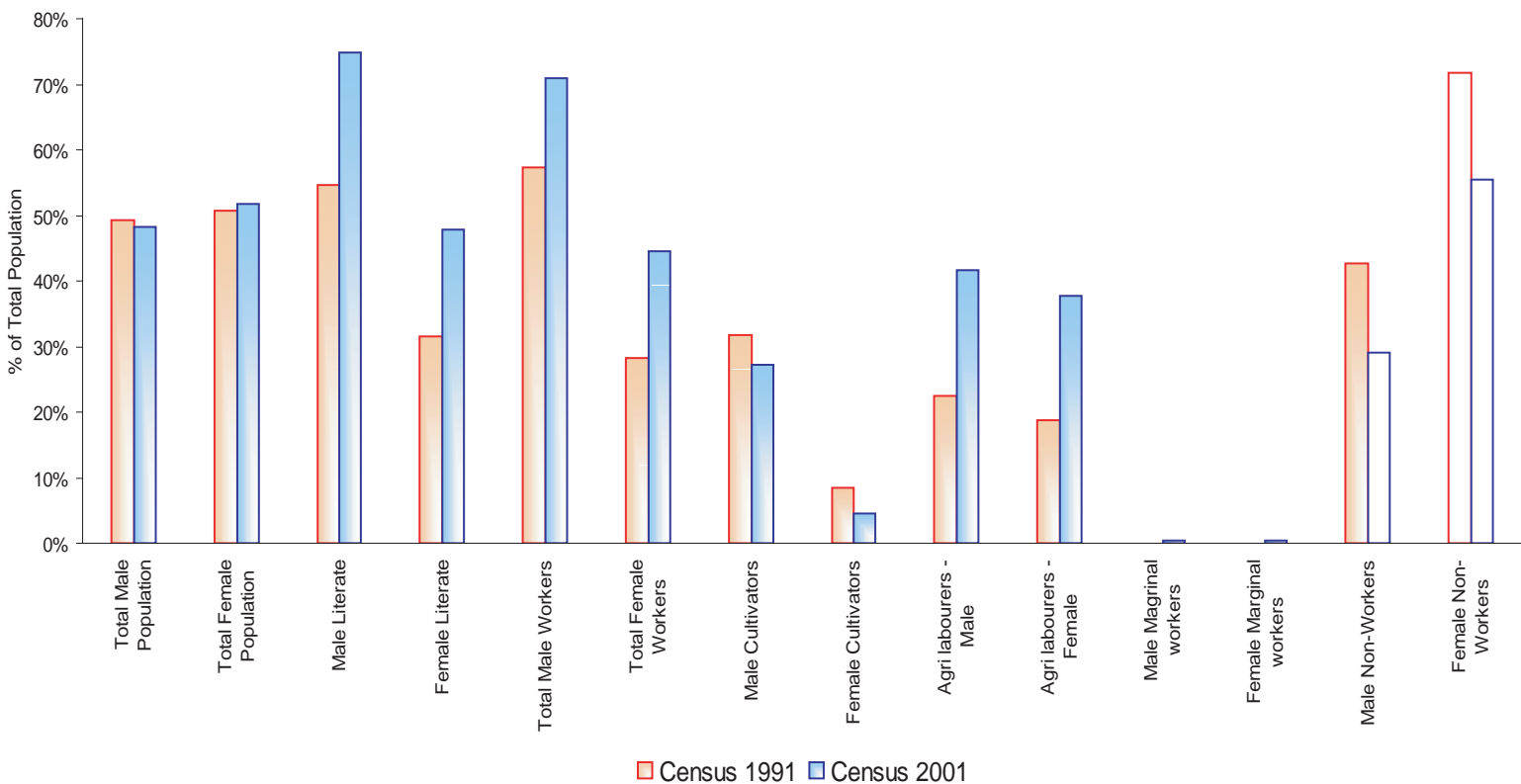


Aruvadai



Mobilisation efforts took about a year in this village mainly due to the fact that the larger and more influential farmers were non-resident in the village. Thus, the project team had to go to the neighbouring large towns to meet and convince these farmers. The local farmers were easier to approach as they were aware of the ongoing work in the project area. The women groups in the village have also been a driving force in the mobilisation efforts. They have also brought in street lights to some parts of the village, organised village cleanup drives and taken up several income generation activities. These illiterate women have also ensured that they are now at least able to read and write their names.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	23/07/2001
No of members	109
Total No of EC members	13
No women EC members	2
Total size of command	250

Fund mobilization (in Rs)	
Individual Farmer's fund	50403.00
Village Common Fund	185207.00
30% contribution	235610.00
70% contribution	549756.67
Total funds raised	785366.67

30%

Physical work 2002-03	
Desilting	16182m ³
Bund strengthening	840m
Jungle clearance	21260m ²
Supply channel	-
Distribution channel	-
Sectioning in m	840m
Construction	-
Increase in water capacity	0.45

Farmer Profile	
> 1 acre	30
1 - 2.5 acres	41
> 2.5 acres	38

WSHG

Womens' Self Help Groups

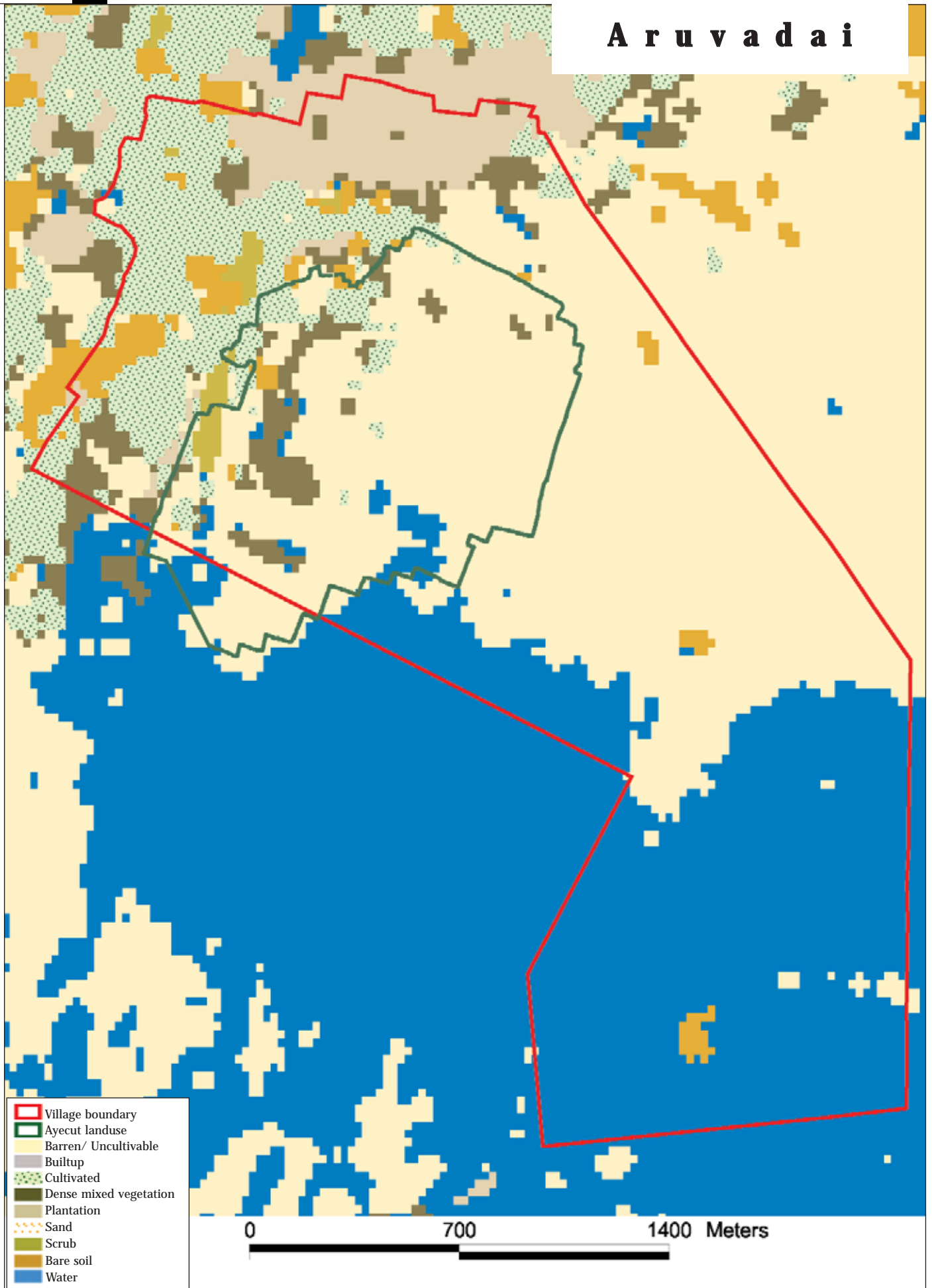
Institutional		
Number of groups: 2		
Group name	Anthimalli	Suyarajiyam
No of members	20	15
Date of formation	01/12/2002	11/09/2001

Financial (in Rs)	
Savings	84290.00
Loans	92850.00

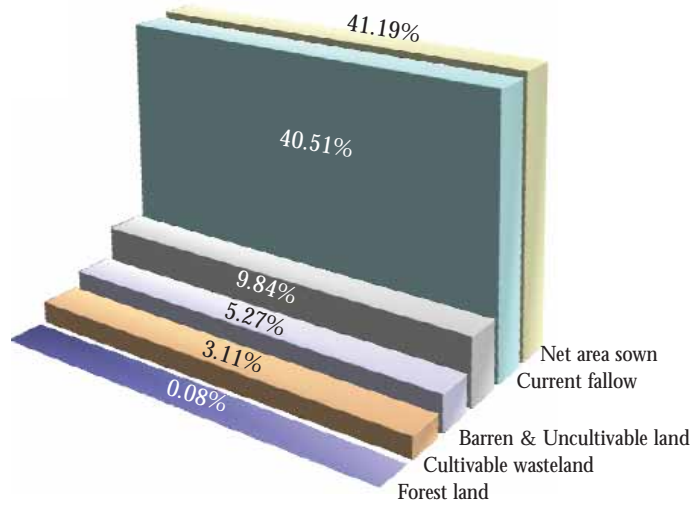
Social activities
Organised eye camp Kitchen garden and herbal medicine Plantation on tank bund

IGP	
	RF
Jointly	Agricultural inputs
individual	Idly shop Purchased cow Redemption of jewels Family expense

A r u v a d a i

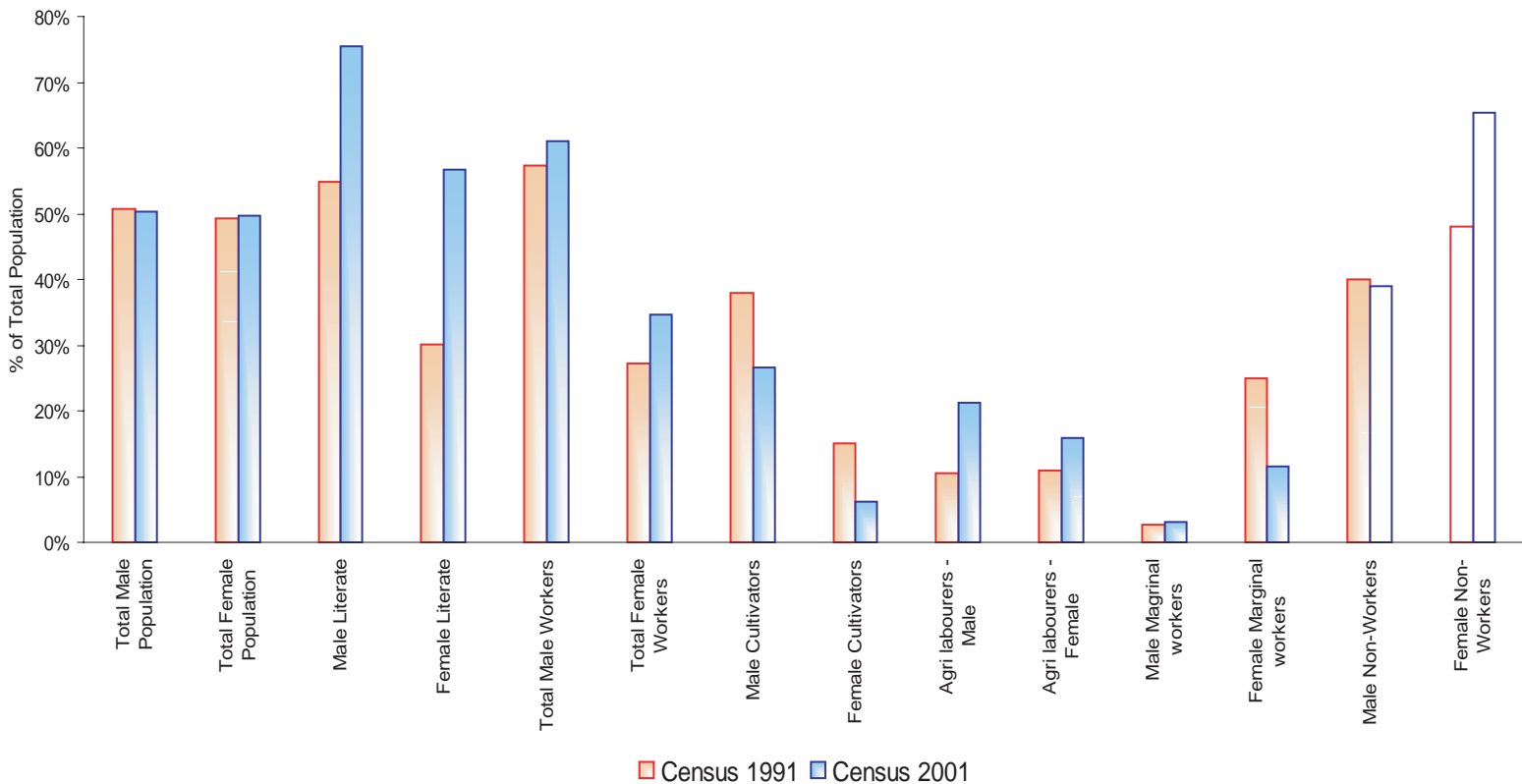


Endiyur



This semi urban village situated near Tindivanam town has two tanks - one under the PWD and the other with the Panchayat. The traditional leadership mechanisms are still strong in the village. The tanks are a source of income to the village fund through the natural resources which are sold, such as reeds. Most of people in the village are well off and several farmers have wells in the command. While initial contact met with a lukewarm response, the several exposure visits helped in convincing the farmers. The difficulty was also that the main tank had received poor inflows, it had overflowed only thrice in the last 30 years and the tail enders had not received water in this period. The tail-enders have only now begun participating in the rehabilitation efforts. Distribution channel work with hollow bricks is scheduled. The farmers from the smaller tank have also taken up several rehabilitation works. They have cleared their distribution channels to ensure water to the tail end. The WPGs have initiated several trials of alternative crops and cropping practices.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	12/09/2000
No of members	72
Total No of EC members	15
No women EC members	2
Total size of command	133.9

30%

Fund mobilization (in Rs)	
Individual Farmer's fund	33750.00
Village Common Fund	178485.00
30% contribution	212235.00
70% contribution	495215.00
Total funds raised	707450.00

Physical work		
	2001-02	2002-03
Desilting	4800m ³	3870 m ³
Bund strengthening	1150m	1150m
Jungle clearance	2900m ²	-
Supply channel	6500m ³	-
Distribution channel	-	--
Sectioning in m	2260m	1150m
Construction	-	Retaining wall
Increase in water capacity	0.26	-

Farmer Profile	
> 1 acre	35
1 - 2.5 acres	23
> 2.5 acres	14

WSHG

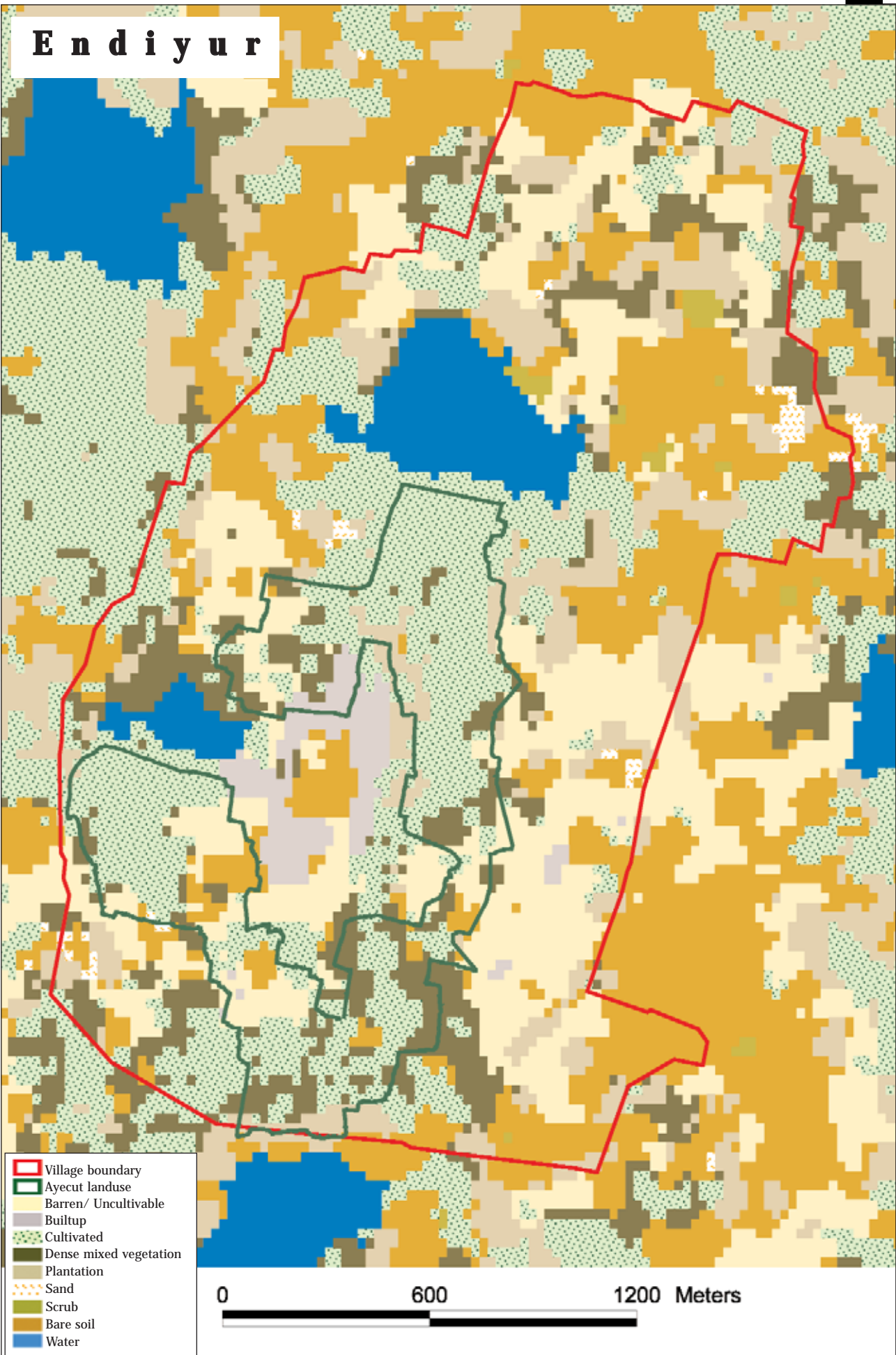
Womens' Self Help Groups

Women Puttadaar Groups		
Group Name	Godhavari	IGP
N° of members	18	Panchakaviyam foliar spray
No. of EC	2	
No. of WP	4	
Date of formation	21/11/2002	
Savings loan	6000	
Loan	2750	

Financial (in Rs)	
Savings	25800.00
Loans	24300.00

Social activities	IGP
Plantation on tank bund	Agricultural inputs Groundnut cultivation Fish Culture

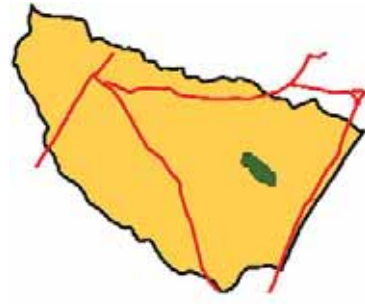
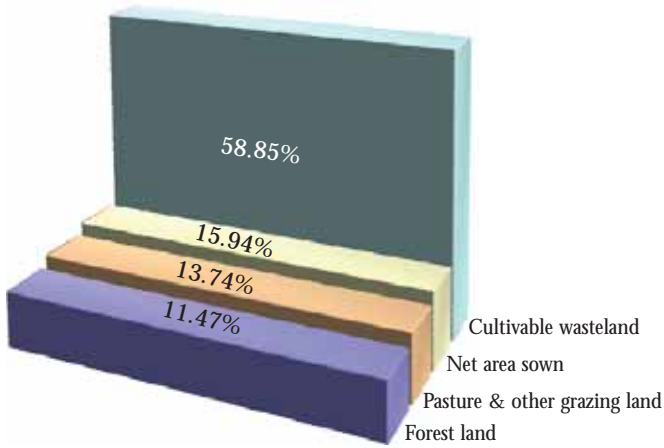
Endiyur



- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

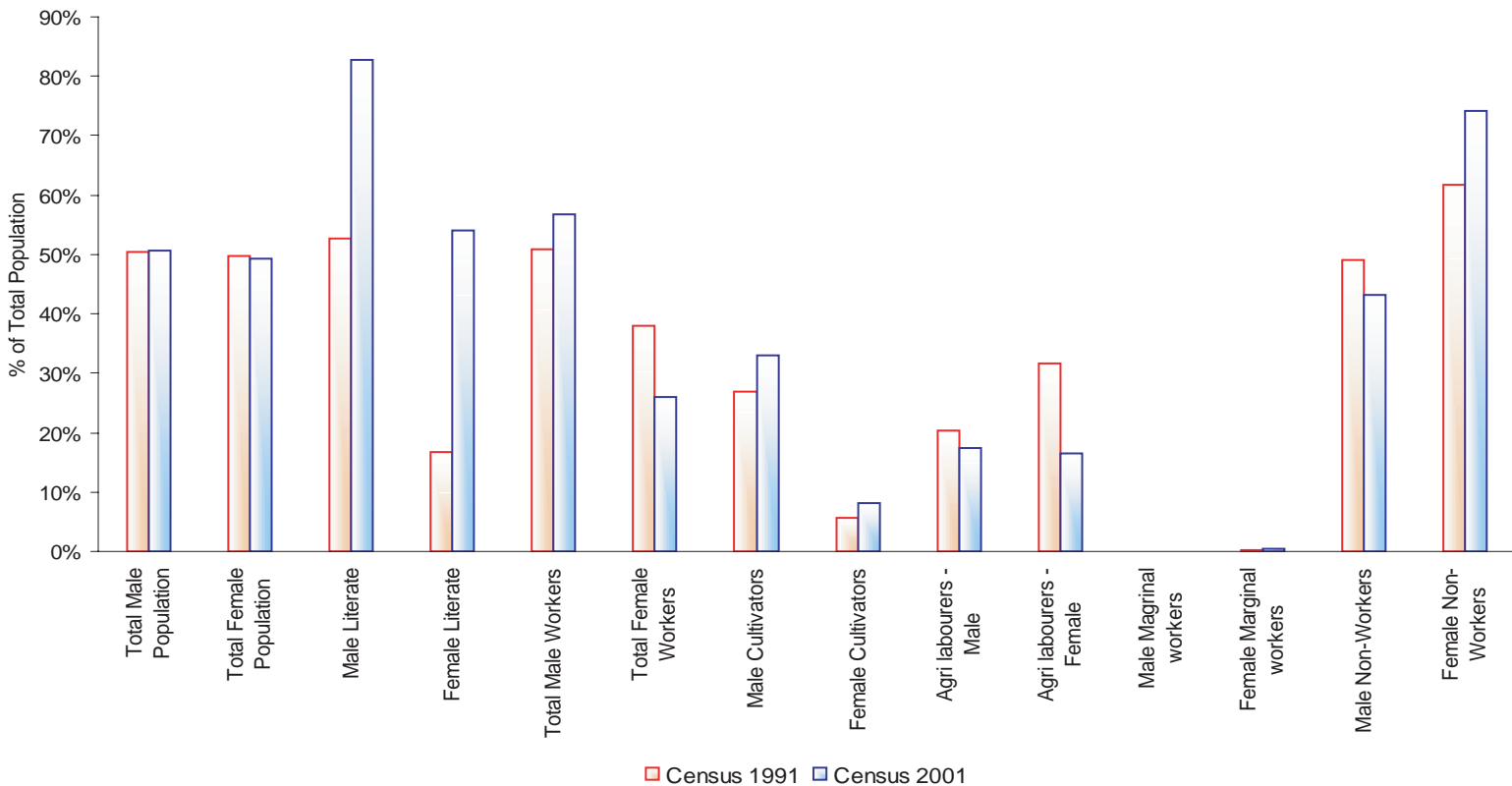
0 600 1200 Meters

Karattai



This Association has been through several ups and downs due to the presence of various factions within the village. The Association itself has been restructured twice to help it become more functional. While individual farmer contributions have been low, a substantial amount has been mobilised through the village common fund. Despite all these problems, they have taken up major activities in their tank and have also removed encroachments.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	21/03/2001
No of members	130
Total No of EC members	15
No women EC members	3
Total size of command	171.97

30%

Fund mobilization (in Rs)	
Individual Farmer's fund	14555.00
Village Common Fund	292250.00
30% contribution	306805.00
70% contribution	715878.33
Total funds raised	1022683.33

Physical work 2002-2003	
Desilting	22098m ³
Bund strengthening	1180m
Jungle clearance	15000m ²
Supply channel	1855m ³
Distribution channel	-
Sectioning in m	1180m
Construction	-
Increase in water capacity	0.58

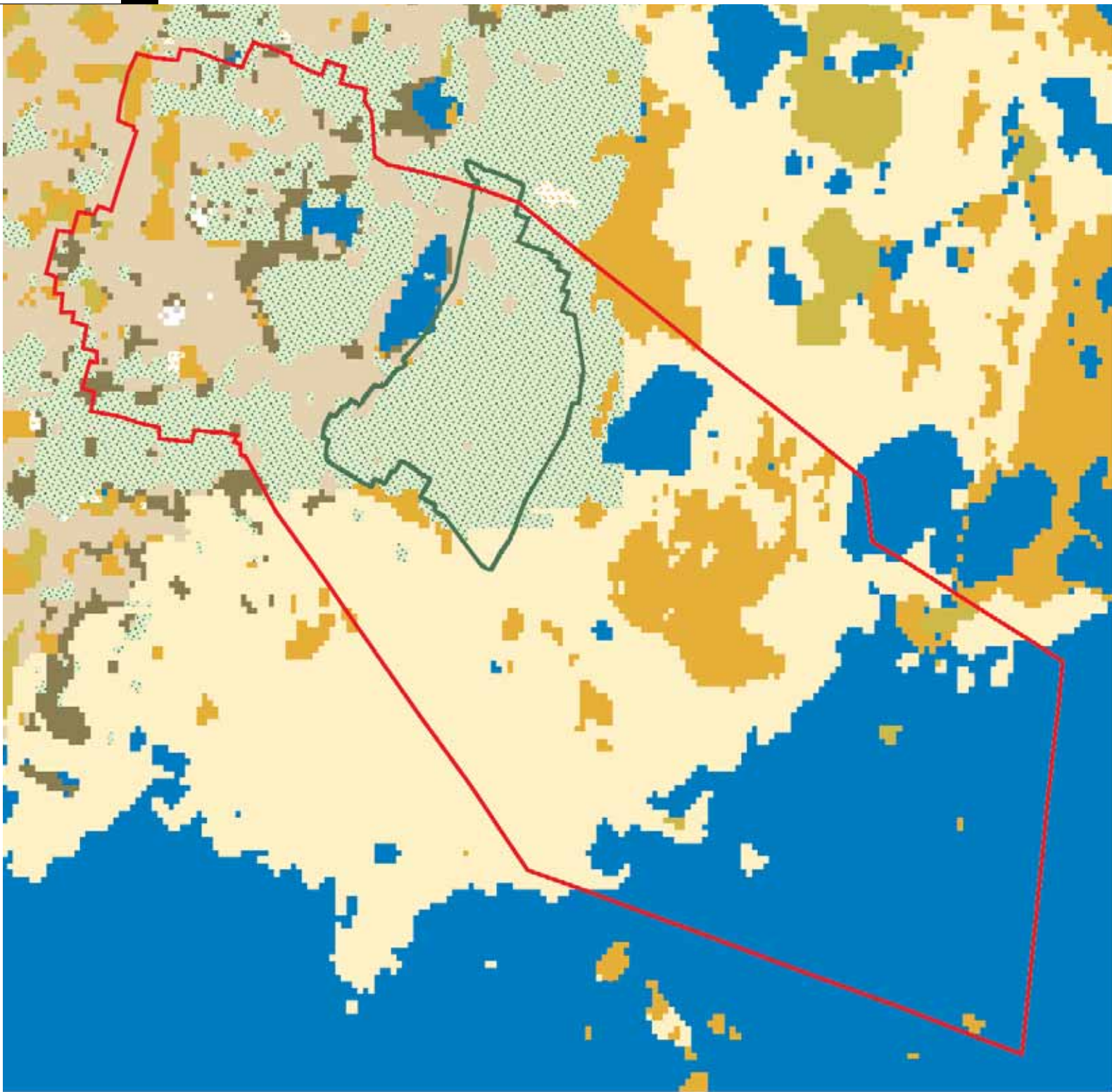
Farmer Profile	
> 1 acre	85
1 - 2.5 acres	23
> 2.5 acres	22

WPG

Women Puttadaar Groups

Institutional	
Group Name	Vaigai
N° of members	20
No. of EC	1
No. of WP	4
Date of formation	11/07/2003
Savings loan	6000
Loan	2750

Financial (in Rs)	
Savings	11500.00
Loans	5850.00

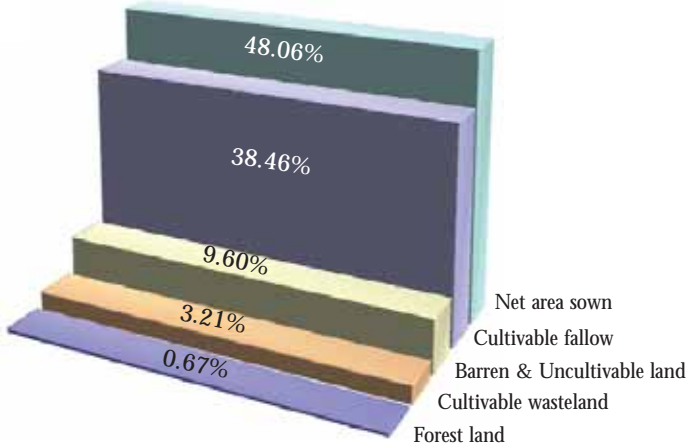


- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 1000 2000 Meters

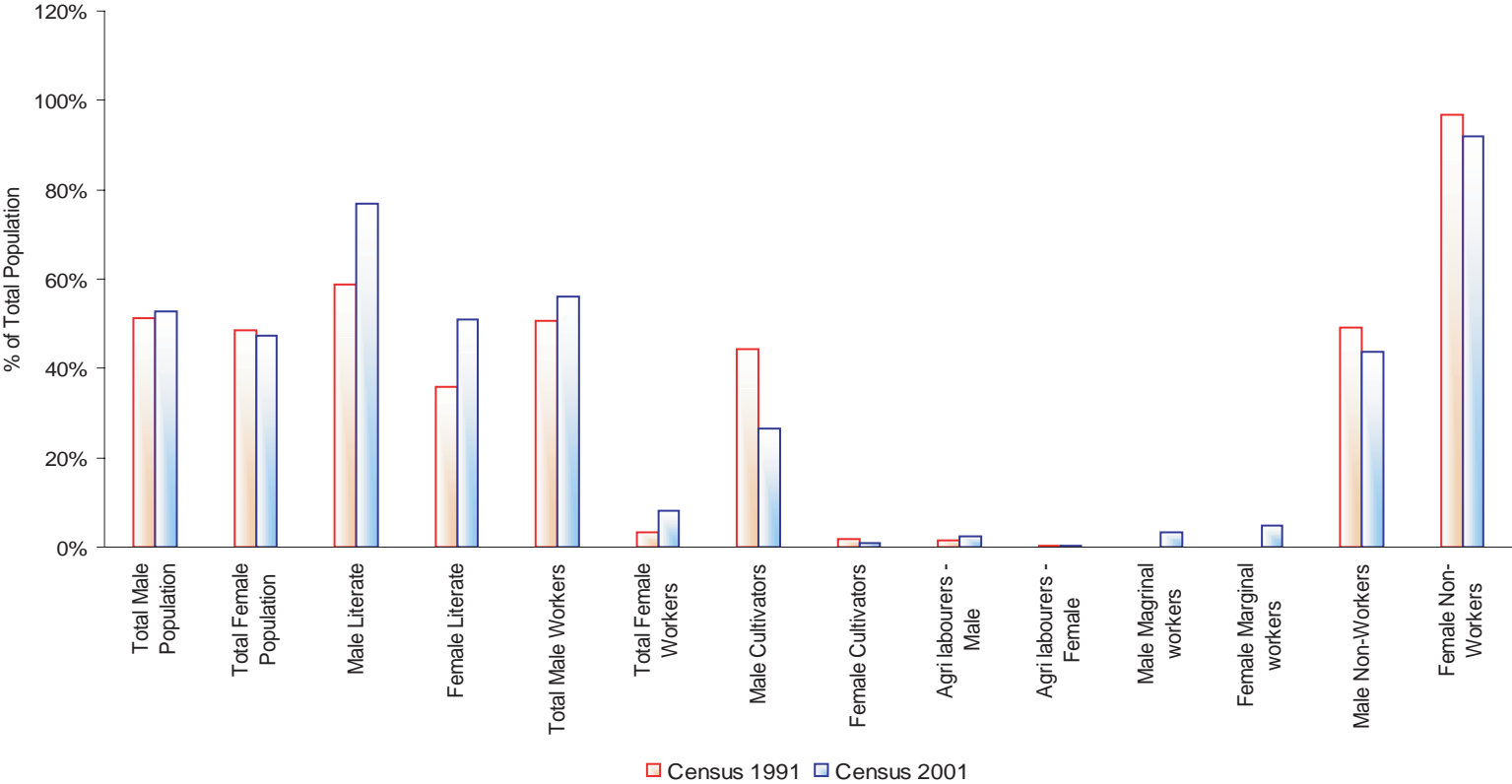
K a r a t t a i

Karasanur



One of the last Associations to be formed, the farmers approached Palmyra on their own. Their strength has been good co-operation and quick decision making amongst themselves. Mobilisation of funds was quick, mainly through the village common fund, and is the second largest amount raised. With a large tank, the major activity taken up was desilting. The WPGs are active in the village and have taken up several activities.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	07/09/2002
No of members	113
Total No of EC members	15
No women EC members	3
Total size of command	99.9

Fund mobilization (in Rs)	
Individual Farmer's fund	24320.00
Village Common Fund	500655.00
30% contribution	524975.00
70% contribution	1224941.00
Total funds raised	1749916.00

30%

Physical work 2003-2004	
Desilting	16350m ³
Bund strengthening	1400m
Jungle clearance	-
Supply channel	200m ³
Distribution channel	-
Sectioning in m	800m
Construction	Sluice wall, distribution 50m
Increase in water capacity	0.58 mcft

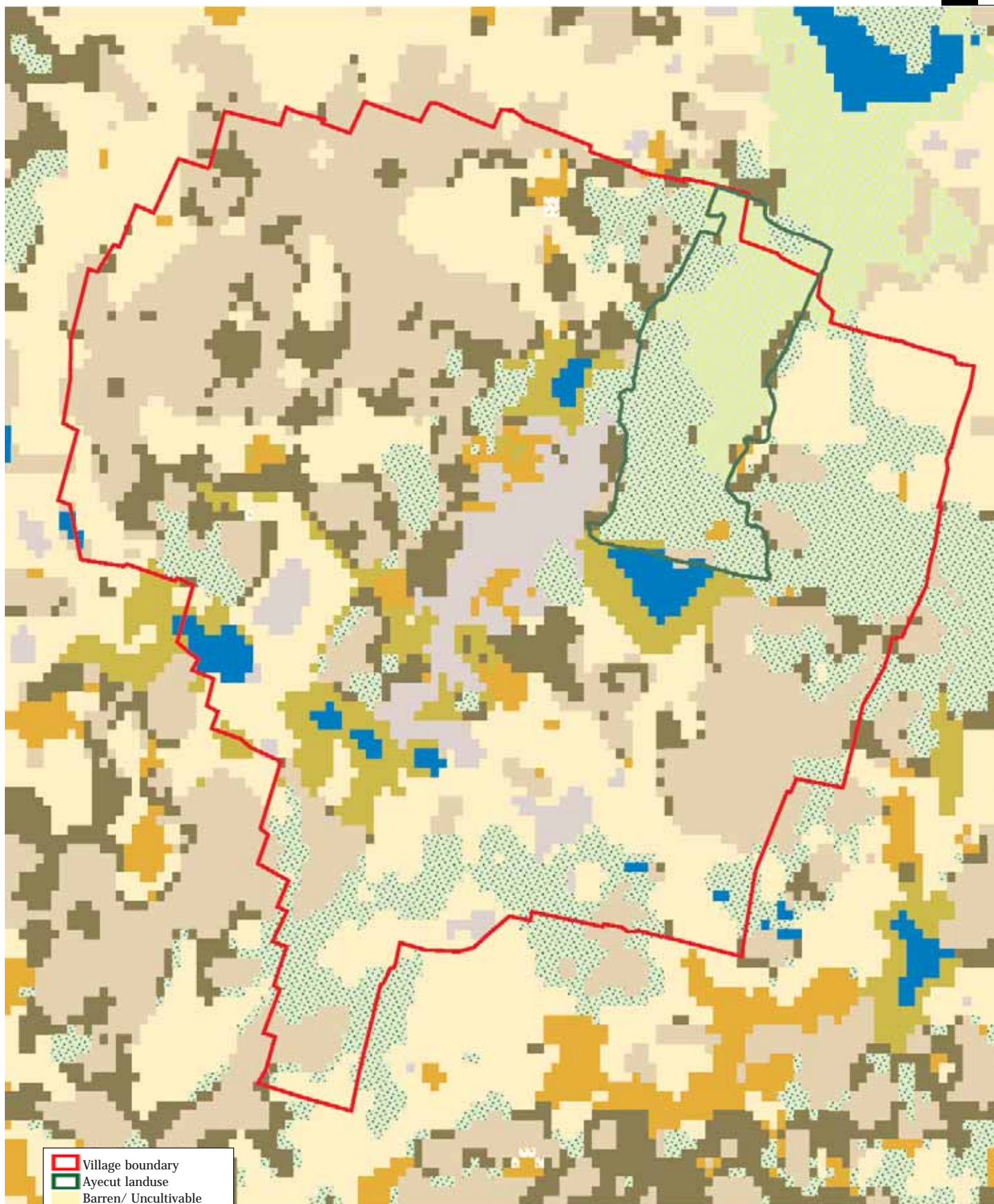
Farmer Profile	
> 1 acre	-
1 - 2.5 acres	-
> 2.5 acres	-

WSHG

Womens' Self Help Groups

Institutional		
Number of groups: 2		
Group name	Narmadhai I	Narmadhai II
No of members	20	20
No of EC Members	1	2
No of Woman Puttadaar	4	2
Date of formation	14/02/2004	14/02/2004

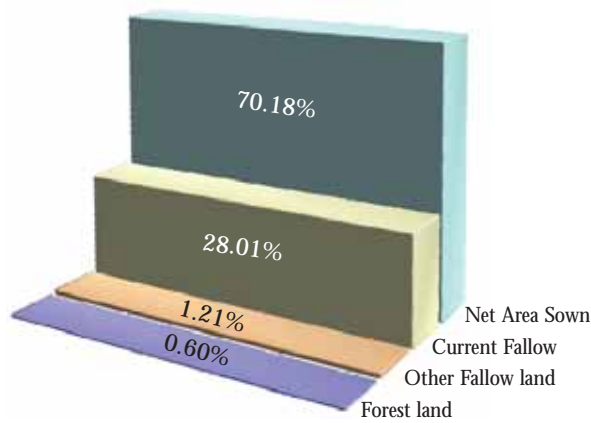
Financial (in Rs)		
	Narmadhai I	Narmadhai II
Savings	32000.00	32000.00
Loans	30500.00	32000.00



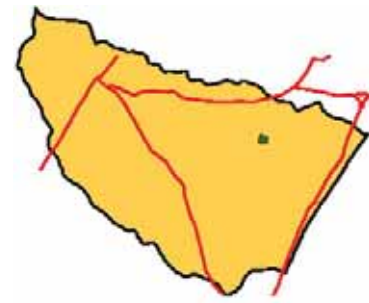
- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 700 1400 Meters

K a r a s a n u r

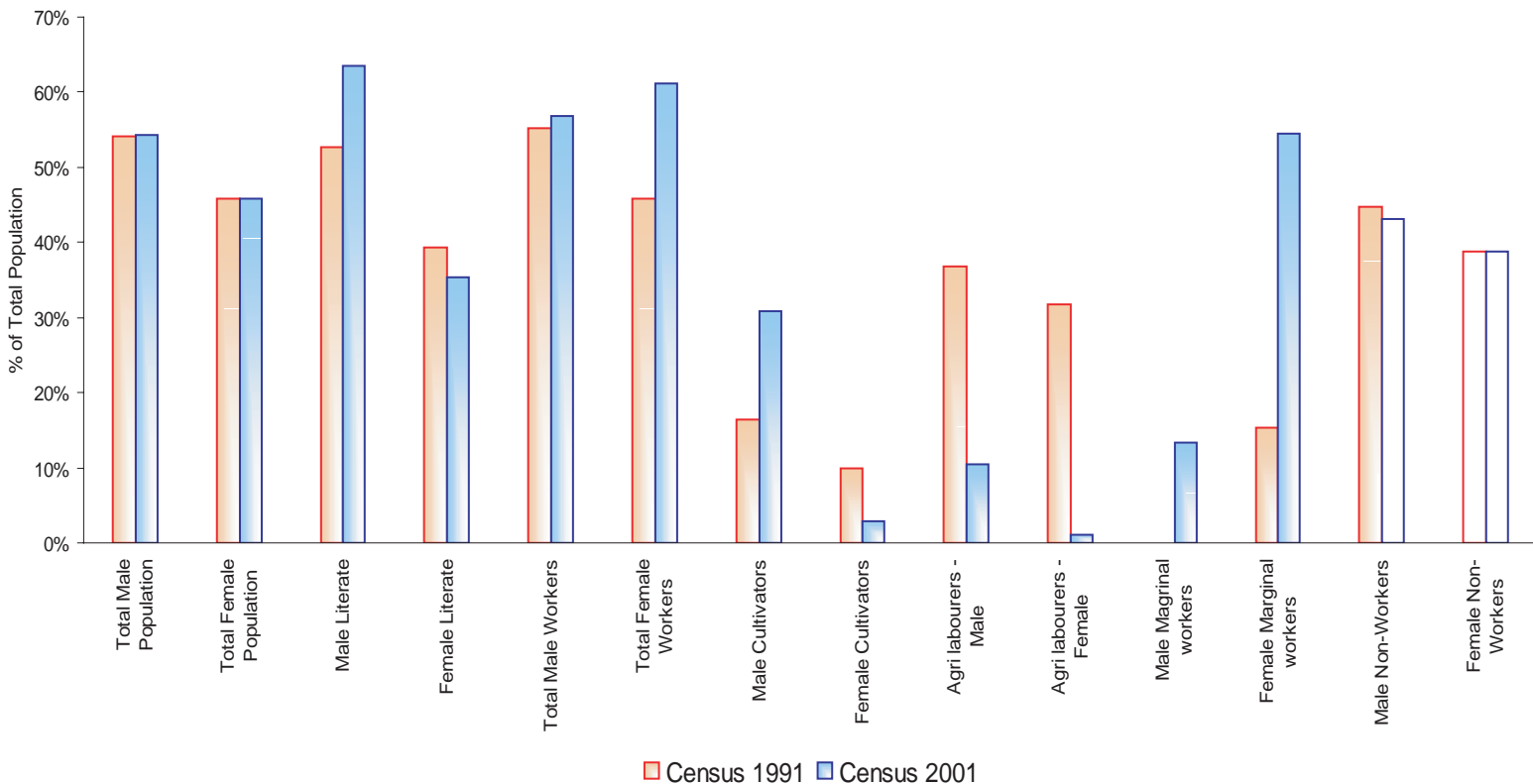


Kayilmedu



Kayalmedu is a small village located towards the interior of the project area, away from any major road. The farmers form a homogenous community of small farmers (92% owning less than 2.5 acres). They are entirely dependent on the tank with only one borewell in the command. As this was one of the early villages taken up, initial efforts put into mobilizing the farmers has been high. Thus while the Association was formed in 1999, contributions started coming in much later and work was carried out only in 2001. The several exposure visits organised, both within the ICEF project and elsewhere, played a major role in changing the farmers' viewpoint. This Association has grown to be one of the strongest with very high levels of participation and involvement of the farmers. The farmers of Kayalmedu were amongst the first to organise the cleaning of the distribution channels in the command on their own. They have also appointed a neerkatti (water manager). They have dug 2 bore wells and installed 2 oil engines to be used during low flows from the tank. The charge of Rs.20/- per hour goes into the Association's kitty. The women Self Help Groups in the village have also worked actively alongside the WUA from collecting contributions, being on site during work implementation and planting on the tank bund. The WUA in turn has supported the SHGs in constructing an overhead drinking water tank in the village and other income generation efforts. The strength of the village has been the spirit of collectivism among both the men and women.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	26/12/1999
No of members	77
Total No of EC members	11
No women EC members	2
Total size of command	83.6

Fund mobilization (in Rs)	
Individual Farmer's fund	83560.00
Village Common Fund	123689.00
30% contribution	207249.00
70% contribution	483581.00
Total funds raised	690830.00

30%

Physical work		
-	2001-2002	2003-2004
Desilting	4000m ³	2500m ³
Bund strengthening	870m	-
Jungle clearance	3500m ²	-
Supply channel	-	-
Distribution channel	500	-
Sectioning in m	870m	-
Construction	Sluice repair	-
Increase in water capacity	0.14 mcft	0.09

Farmer Profile	
> 1 acre	43
1 - 2.5 acres	28
> 2.5 acres	6

WSHG

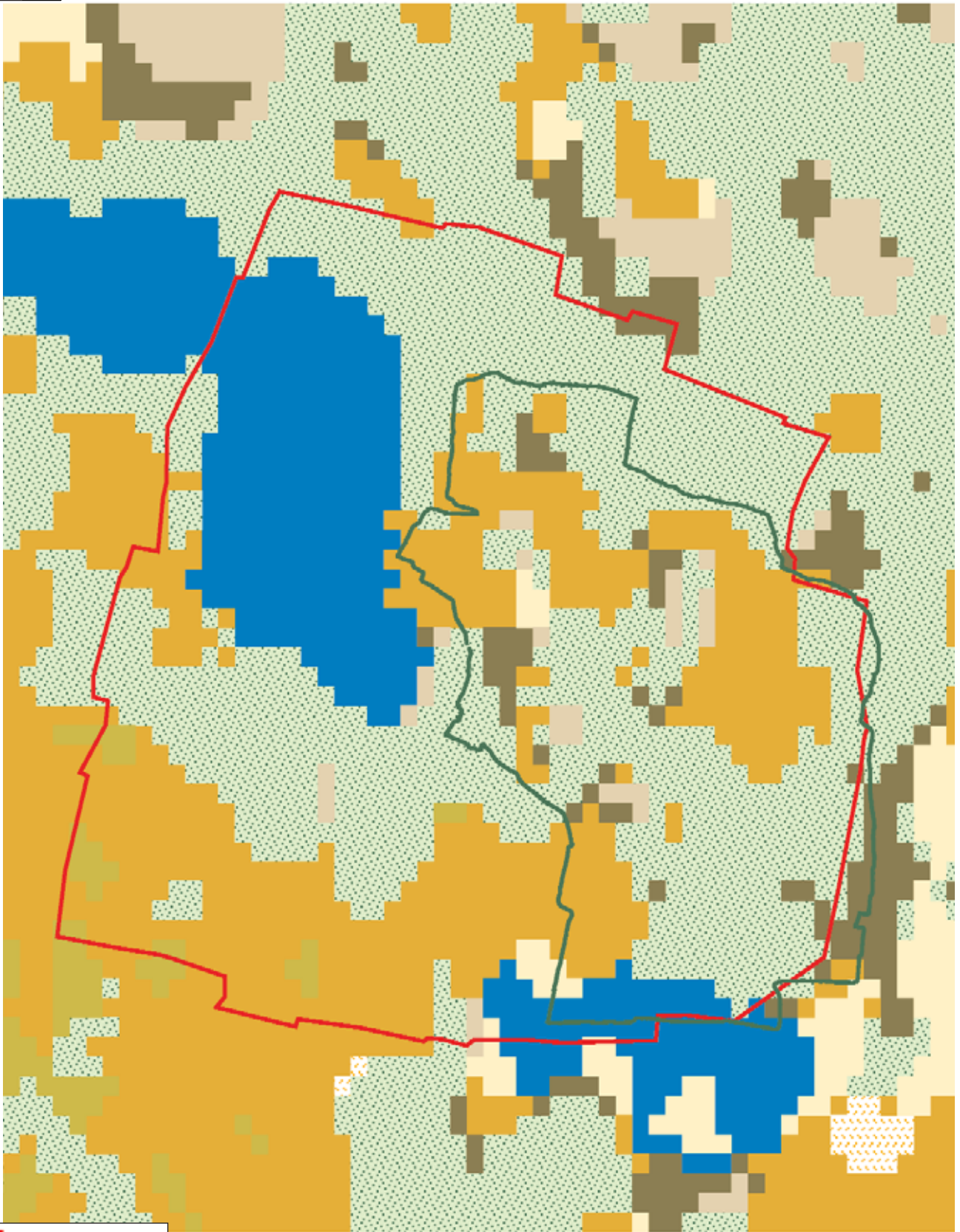
Womens' Self Help Groups

Institutional	
Group name	Avarampoo
No of members	15
Date of formation	19/072001

Financial (in Rs)	
Savings	32490.00
Loans	35870.00

Social activities
Organised eye camp Kitchen garden and herbal medicine Plantation on tank bund

IGP		
	EA	RF
Jointly	Brick making	Cattle
Individual		

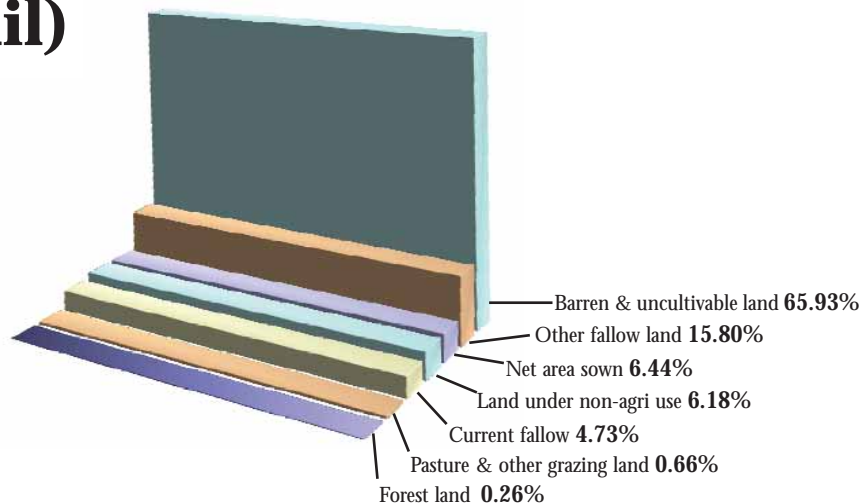


- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 400 800 Meters

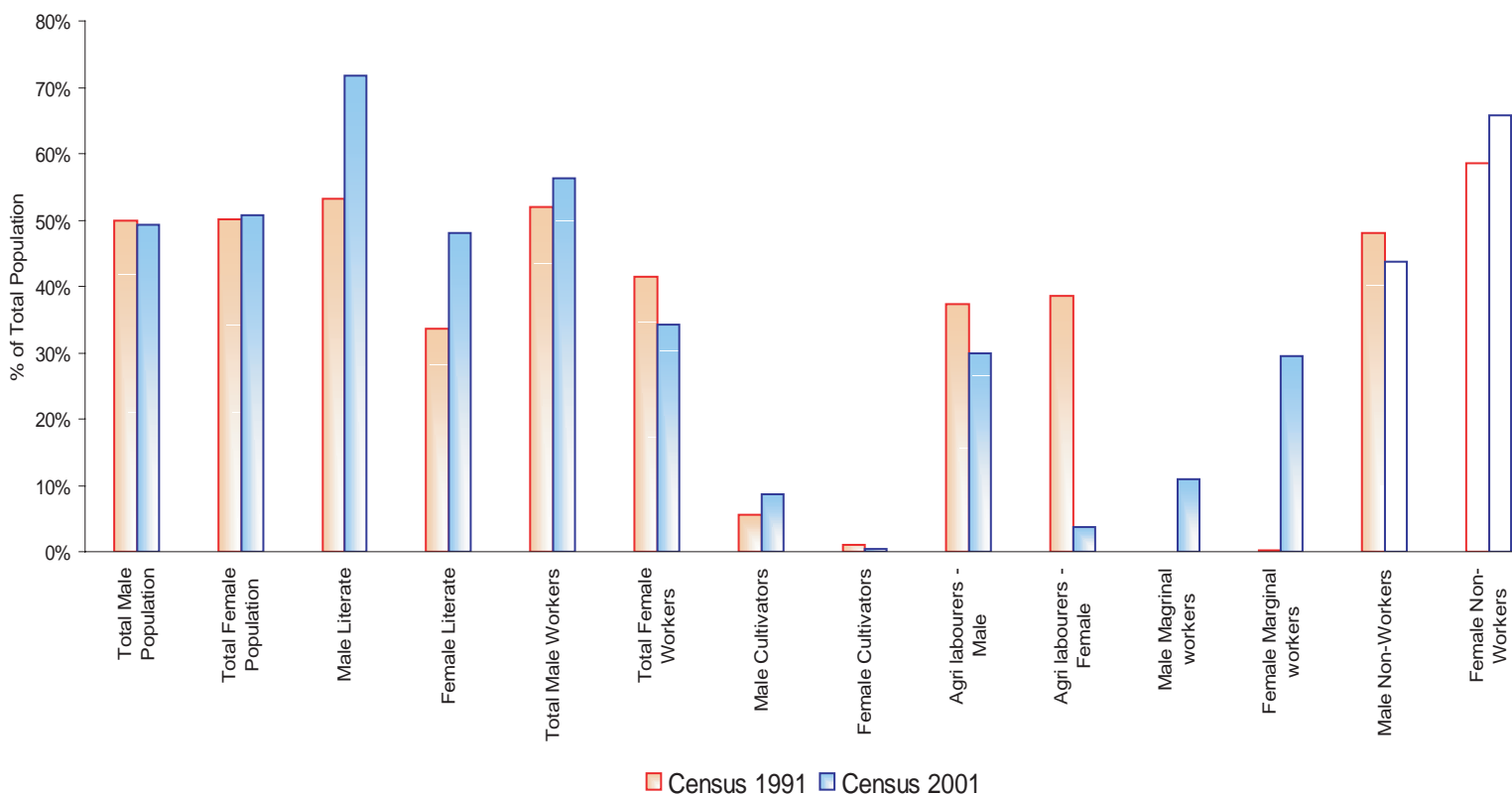
K a y i l m e d u

Kuttappakkam(Kil)



This association was formed in 2000 and the work was carried out in 2000 and 2001. Contribution collection was a problem in the village. The village traditional leaders ('nattamais') were not interested in the common fund being utilised for tank rehabilitation work. They however then agreed to help and provided the funds for a dead storage area to be created. This is being used to raise fish and the income generated goes to the Association. Contributions also started coming in from individual farmers as work progressed. Substantial work was done, including clearing of weeds which was a major problem. A local pond was also desilted, where the women SHGs are raising fish. They have also been active in plantation work on the tank bund. The micro-credit initiative has provided several members an opportunity to get out of the crippling debt situation. They have also leased land to cultivate and generate additional income within the group.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	17/05/2000
No of members	47
Total No of EC members	11
No women EC members	2
Total size of command	93.14

Fund mobilization (in Rs)	
Individual Farmer's fund	25641.00
Village Common Fund	61675.00
30% contribution	87316.00
70% contribution	203737.33
Total funds raised	291053.33

30%

Physical work		
	2000-2001	2002-2003
-		
Desilting	-	2540m ³
Bund strengthening	-	150m
Jungle clearance	10107m ²	-
Supply channel	2700m ³	-
Distribution channel	-	-
Sectioning in m	2810m	150
Construction	Sluice repair	-
Increase in water capacity	-	0.05mcft

Farmer Profile	
> 1 acre	29
1 - 2.5 acres	8
> 2.5 acres	10

WSHG

Womens' Self Help Groups

Institutional		
Number of Groups: 2		
Group name	Alaigal	Malaicharal
No of members	20	20
Date of formation	04/04/2001	03/05/2002

Financial (in Rs)		
	Alaigal	Malaicharal
Savings	2500.00	1498.00
Loans	94650.00	31650.00

Social activities	
Organised eye camp	
Kitchen garden and herbal medicine	
Plantation on tank bund	
Pond desilting	

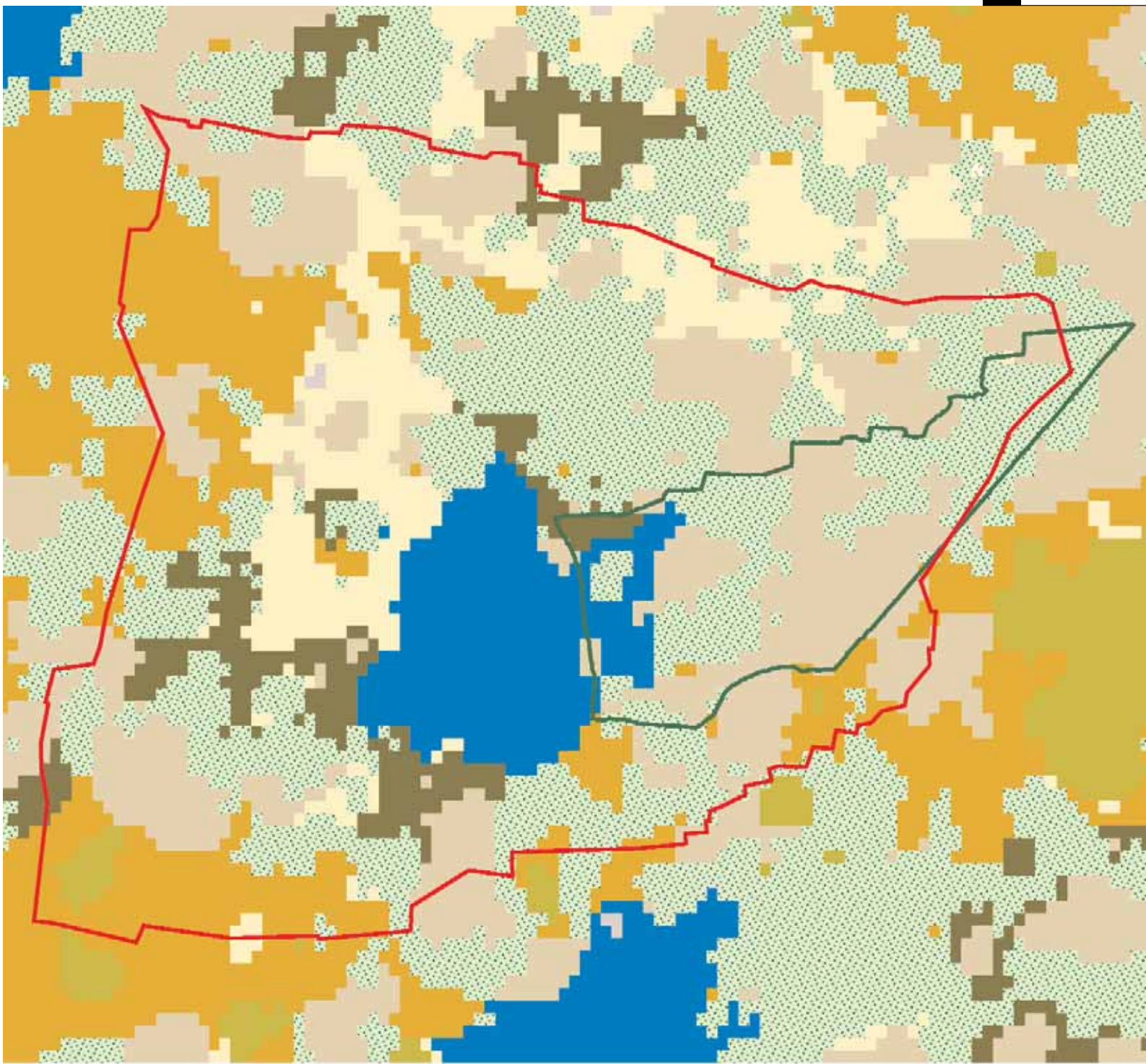
IGP	
	RF
Jointly	Buying plot
Individual	Family expense Saree business

WPG

Women Puttadaar Groups

Institutional		
Number of groups: 2		
Group name	Krishna I I	Krishna II
No of members	16	15
No of EC Members	2	1
No of Woman Puttadaar	3	5
Date of formation	18/10/2002	30/01/2003
IGP	Panchakaviyam foliar spray	

Financial (in Rs)		
	Narmadhai I	Narmadhai II
Savings	14100.00	13732.00
Loans	6800.00	20500.00

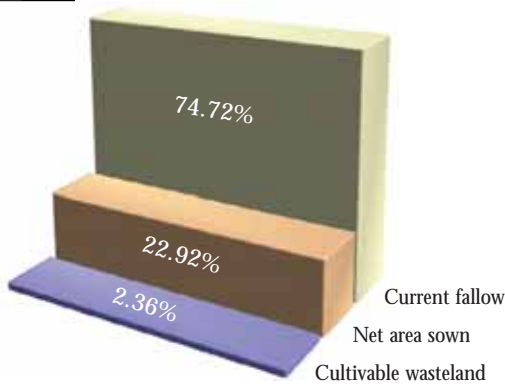


0 0.4 0.8 Kilometers

- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

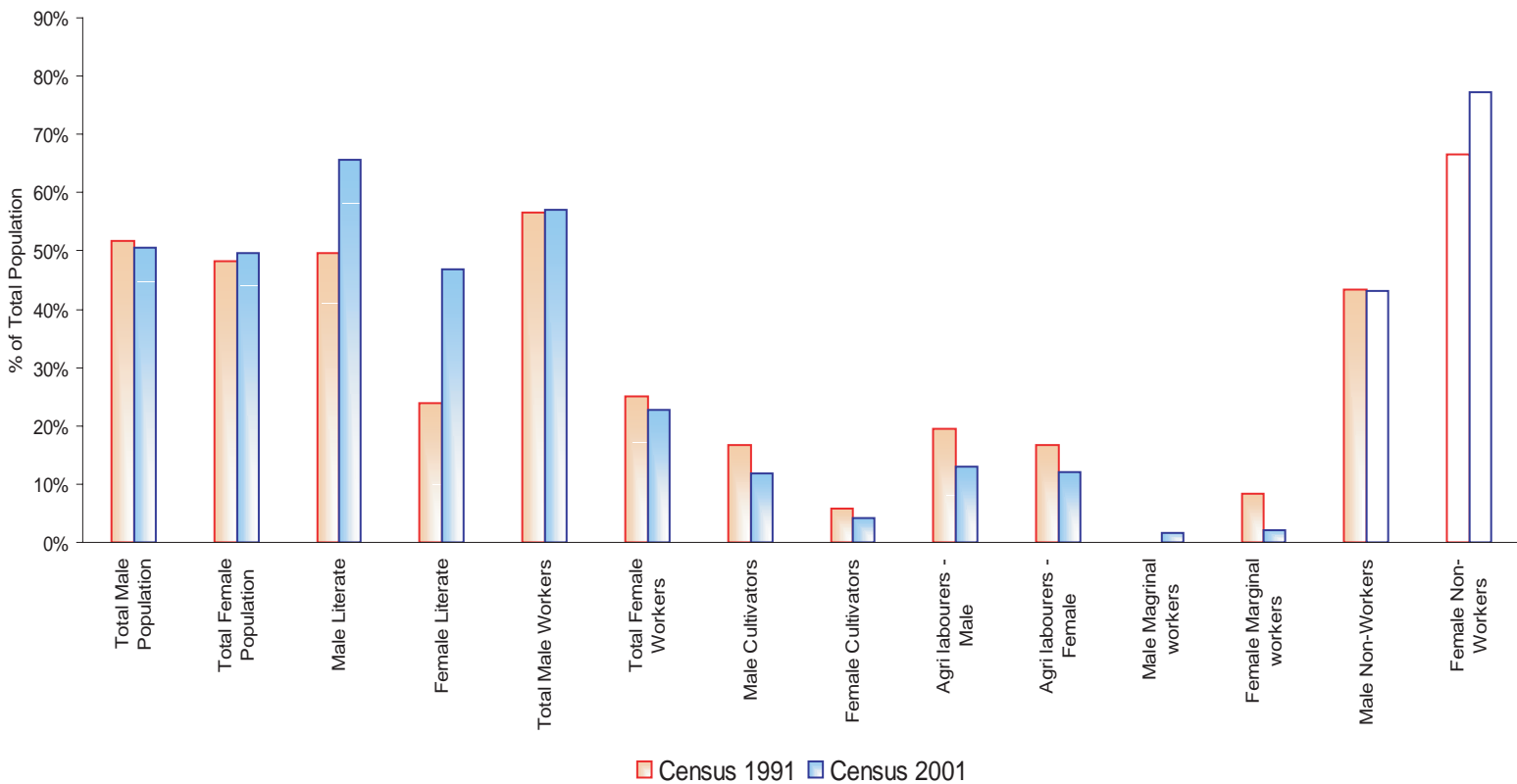
K u t t a p p a k k a m (k i l)

Puduppattu (Kil)



The command area of the tank in this village borders the Kalivelli wetlands. Thus, the first crop is mainly rainfed with additional irrigation being available from the wetland area. The water stored in the tank is utilised entirely for the second crop. The farmers approached Palmyra on their own to take up activities. Substantial work has been done on the tank, the onset of monsoons left some uncompleted. These activities and additional ones with further funds mobilised are being taken up in the coming year. The Association has also purchased an oil engine to ensure irrigation towards the end of the season. Its rental provides an additional source of income.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	04/07/2002
No of members	85
Total No of EC members	15
No women EC members	3
Total size of command	83.9

Fund mobilization (in Rs)	
Individual Farmer's fund	44150.00
Village Common Fund	298720.00
30% contribution	342870.00
70% contribution	800030.00
Total funds raised	1142900.00

30%

Physical work		
	2002-2003	2003-2004
-		
Desilting	7500m ³	6000m ³
Bund strengthening	340m	-
Jungle clearance	-	-
Supply channel	-	-
Distribution channel	-	-
Sectioning in m	340m	-
Construction	Sluice repair	-
Increase in water capacity	0.41mcft	0.21mcft

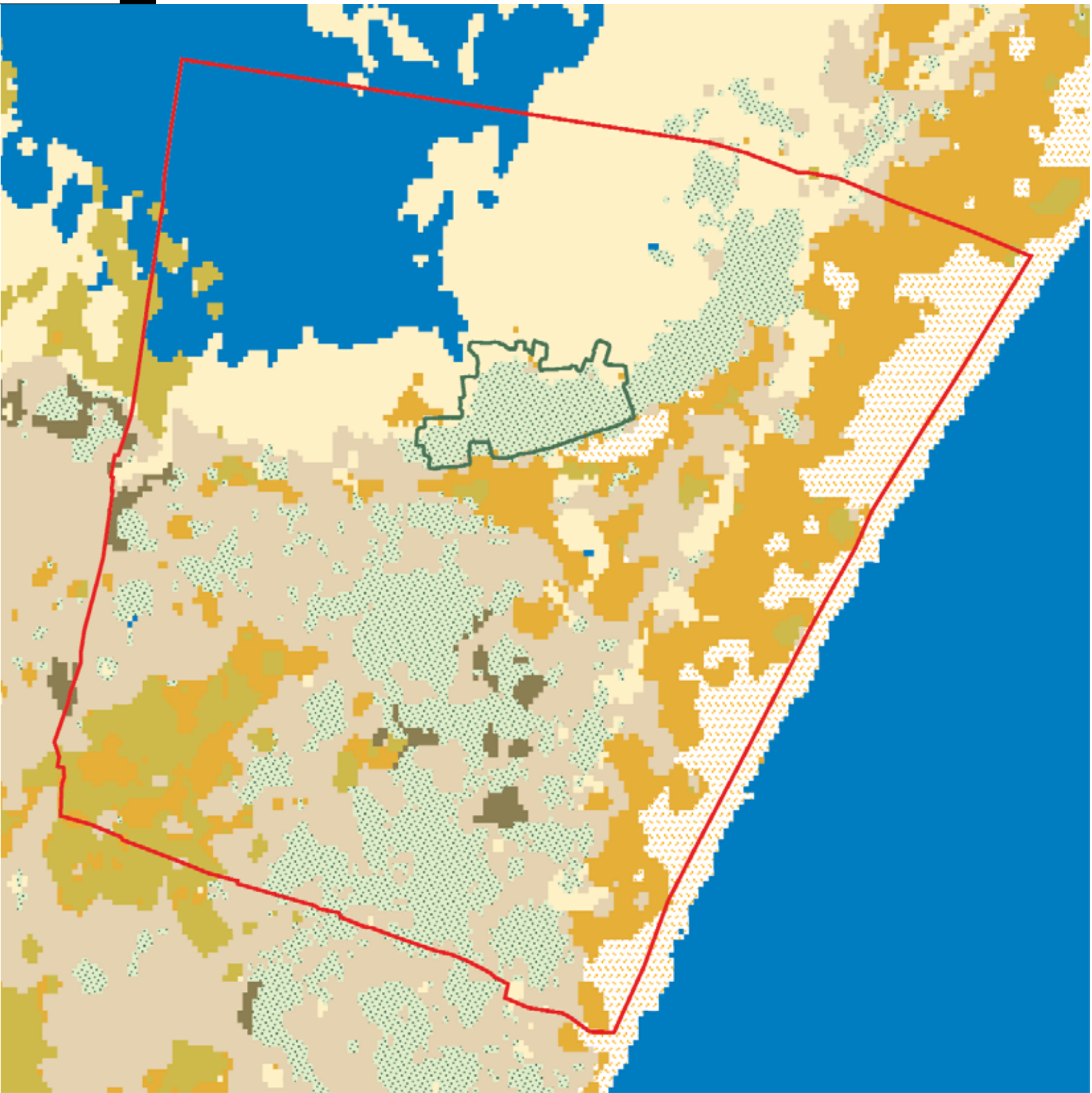
Farmer Profile	
> 1 acre	58
1 - 2.5 acres	26
> 2.5 acres	1

WPG

Women Puttadaar Groups

Institutional	
Group name	Bhavani
No of members	20
No of EC Members	2
No of Woman Puttadaar	2
Date of formation	20/01/03
IGP	Agriculture

Financial (in Rs)	
	Narmadhai I
Savings	14700.00
Loans	-

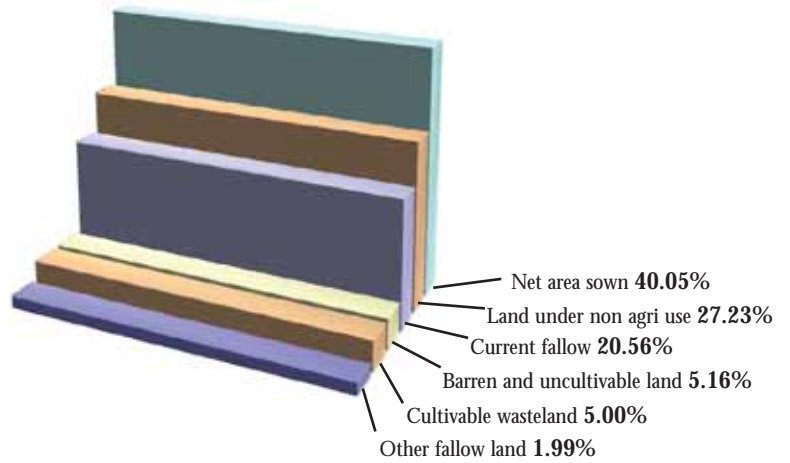


- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 1000 2000 Meters

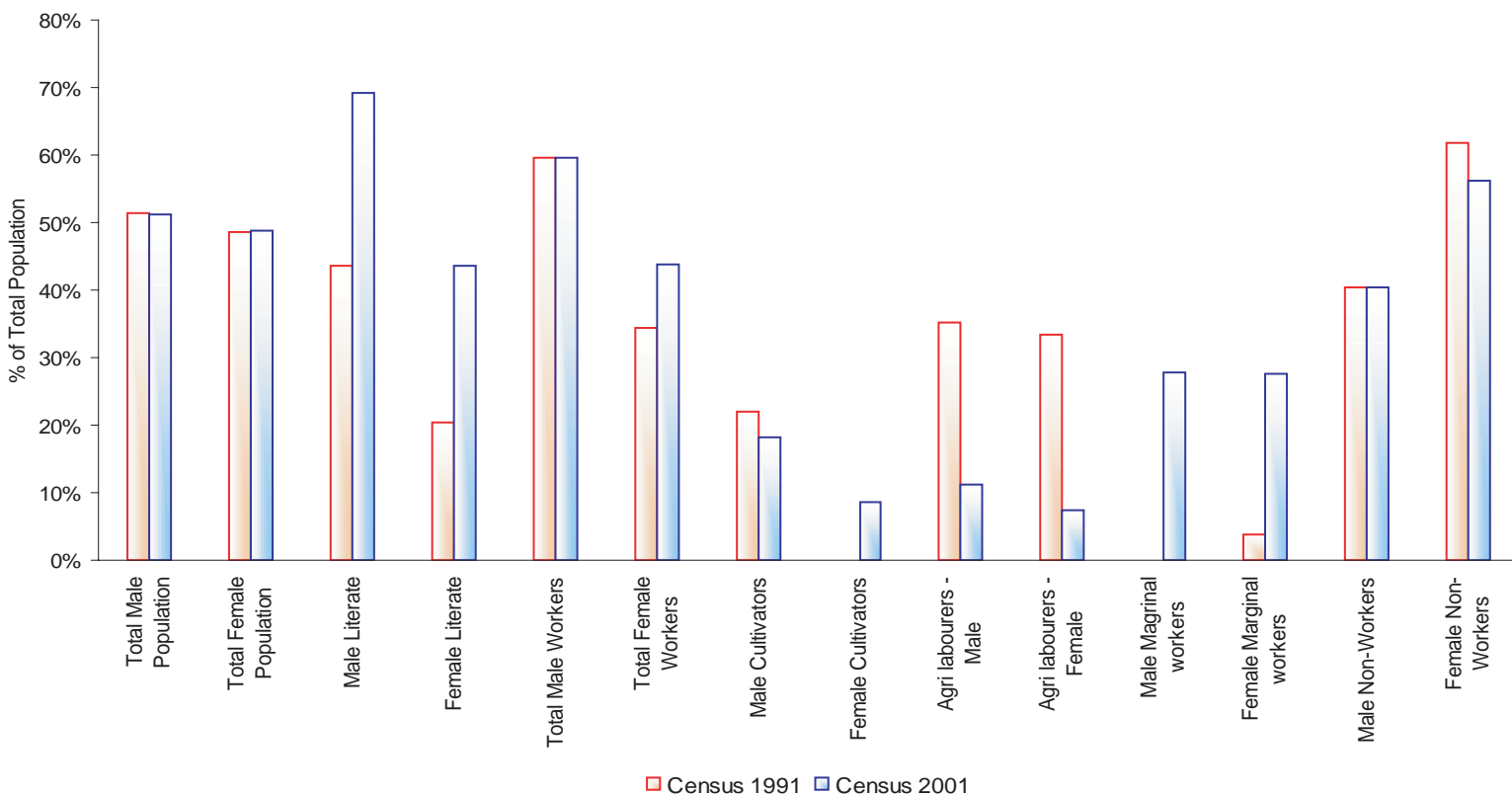
P u d u p p a t t u (k i l)

Kunjimangalam



A large village situated on the western border of the Kalivelli wetlands, the main source of irrigation is the 'Madhuvu' (channel). It is the final collection point of overflows from several tanks and then flows into the wetlands. A large area is irrigated by a large number of farmers. The farmers belong to two communities and there is a good understanding between them. A major part of their work was to clear the channel of weeds to ensure proper water inflows and storage. The SHG in the village functions effectively as sharing responsibilities is their forte. They have also taken up several village development activities such as ensuring drinking water and maintaining public toilets.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	16/04/2001
No of members	110
Total No of EC members	13
No women EC members	2
Total size of command	194.5

Fund mobilization (in Rs)	
Individual Farmer's fund	27350.00
Village Common Fund	0.00
30% contribution	27350.00
70% contribution	63816.67
Total funds raised	91166.67

30%

Physical work	
-	2003-2004
Desilting	1500m ³
Bund strengthening	-
Jungle clearance	7000m ²
Supply channel	-
Distribution channel	-
Sectioning in m	-
Construction	-
Increase in water capacity	0.052971mcft

Farmer Profile	
> 1 acre	21
1 - 2.5 acres	68
> 2.5 acres	21

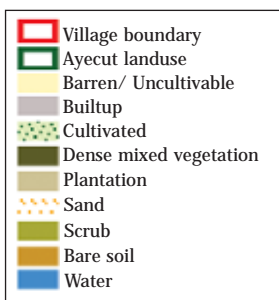
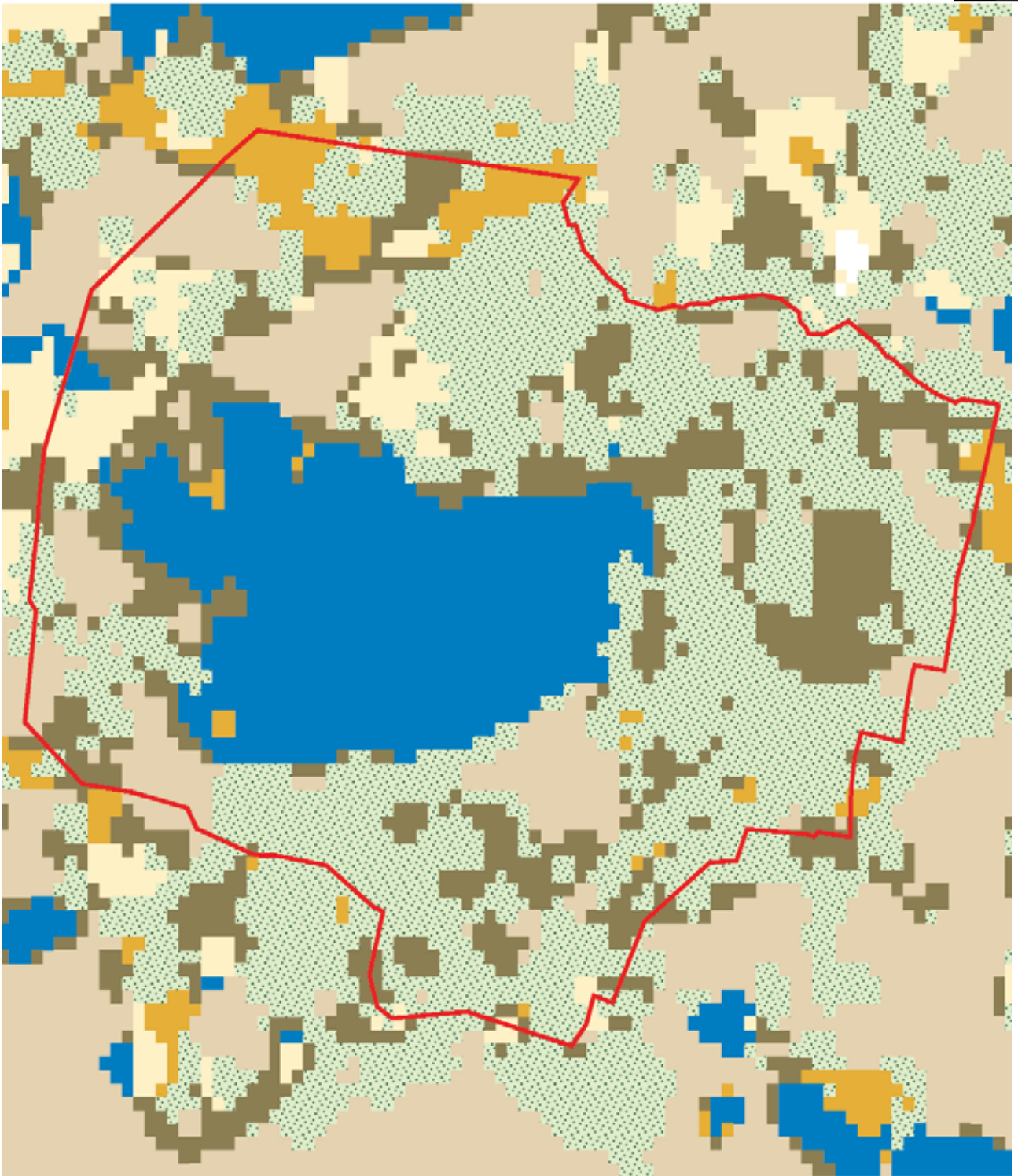
WSHG

Womens' Self Help Groups

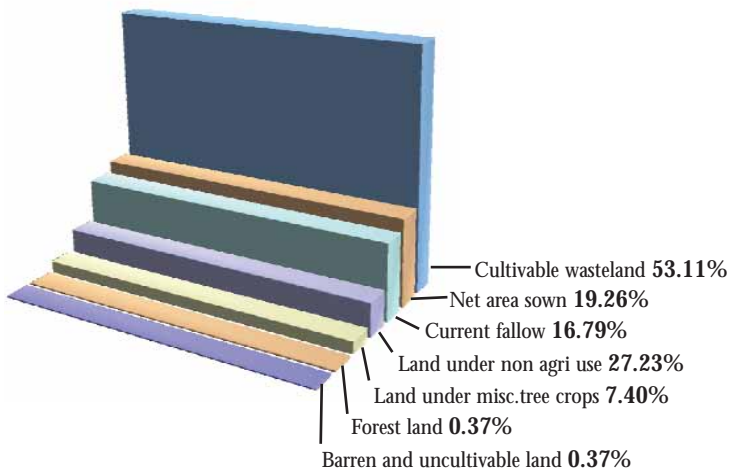
Institutional	
Group name	Om shakthi
No of members	16
Date of formation	29/03/2001

Financial (in Rs)	
Savings	66800.00
Loans	81550.00

IGP	
	RF
Jointly	
Individual	Family expense Agriculture Groceries shop Purchase of cow Idly shop Char coal



K u n j i m a n g a l a m

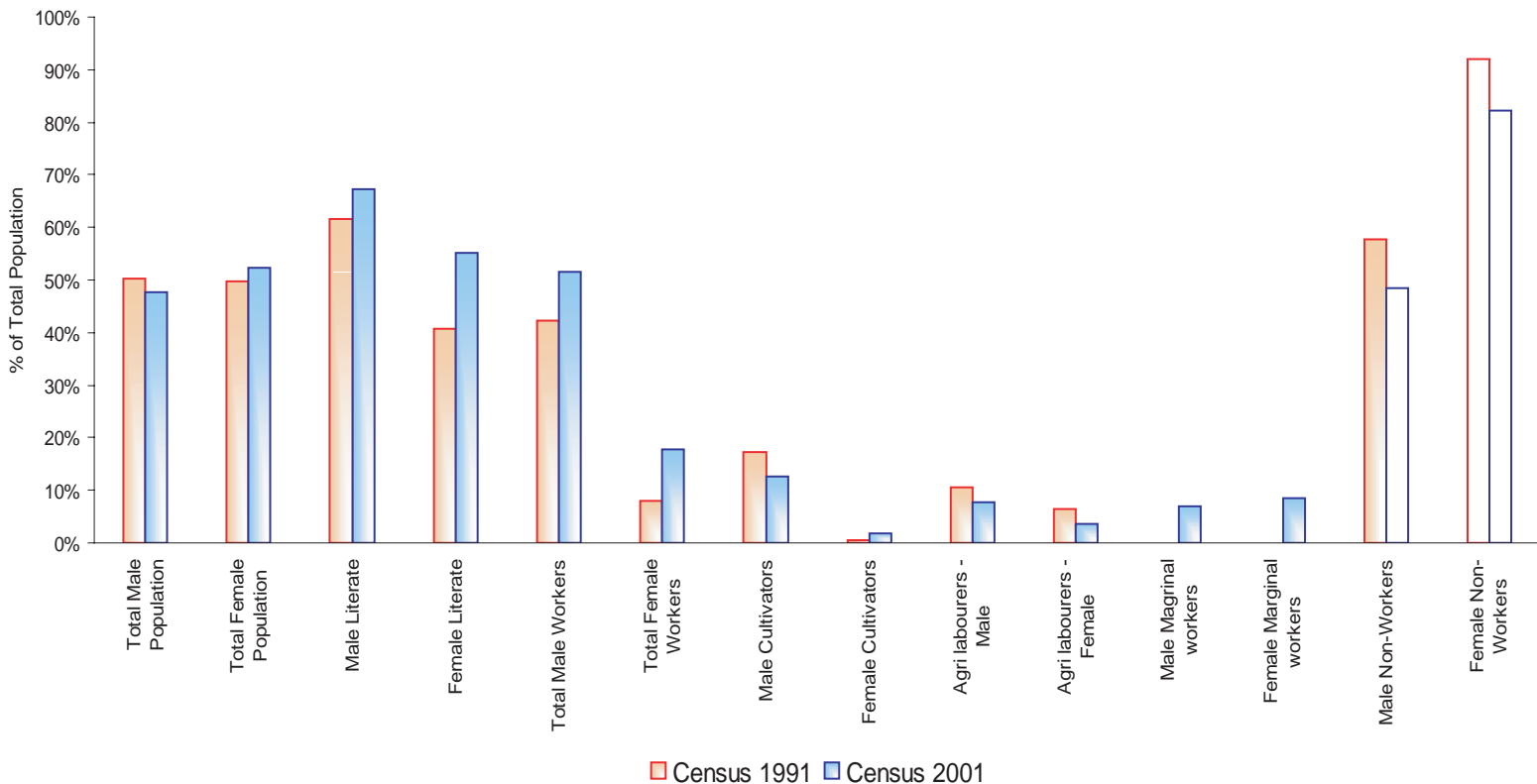


Kunimedu



Situated along the East Coast Road this is large and quite wealthy village. The population is a mix of different communities all of whom have a good understanding with each other. The farmers themselves approached Palmyra to take up rehabilitation work within their tank. The tank, though falling under two revenue villages, has command area farmers mainly from one village. The Association was formed quickly and contributions collected. They were successful in removing encroachments from within the tank boundary. While initial co-ordination between farmers was very good some conflicts did arise during implementation. However the Association did not let this hinder work and internally resolved these conflicts. They were also quick to act when a breach was discovered on the tank bund after heavy rains. They have ensured water flow to the tail end by working on the distribution channels and have also appointed a neerkatti. The WPG has several active women who participate in activities both within and outside the village and also in motivating other women. Through soil testing campaigns and trial plots they have taken the lead in trying to boost agricultural productivity in their fields.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	02/02/2002
No of members	144
Total No of EC members	17
No women EC members	3
Total size of command	151.94

Fund mobilization (in Rs)	
Individual Farmer's fund	82410.00
Village Common Fund	331830.00
30% contribution	414240.00
70% contribution	966560.00
Total funds raised	1380800.00

30%

Physical work	
-	2002-2003
Desilting	34460m ³
Bund strengthening	510m
Jungle clearance	-
Supply channel	-
Distribution channel	1515
Sectioning in m	510m
Construction	Steps, weir
Increase in water capacity	0.71mcft

Farmer Profile	
> 1 acre	83
1 - 2.5 acres	53
> 2.5 acres	8

WPG

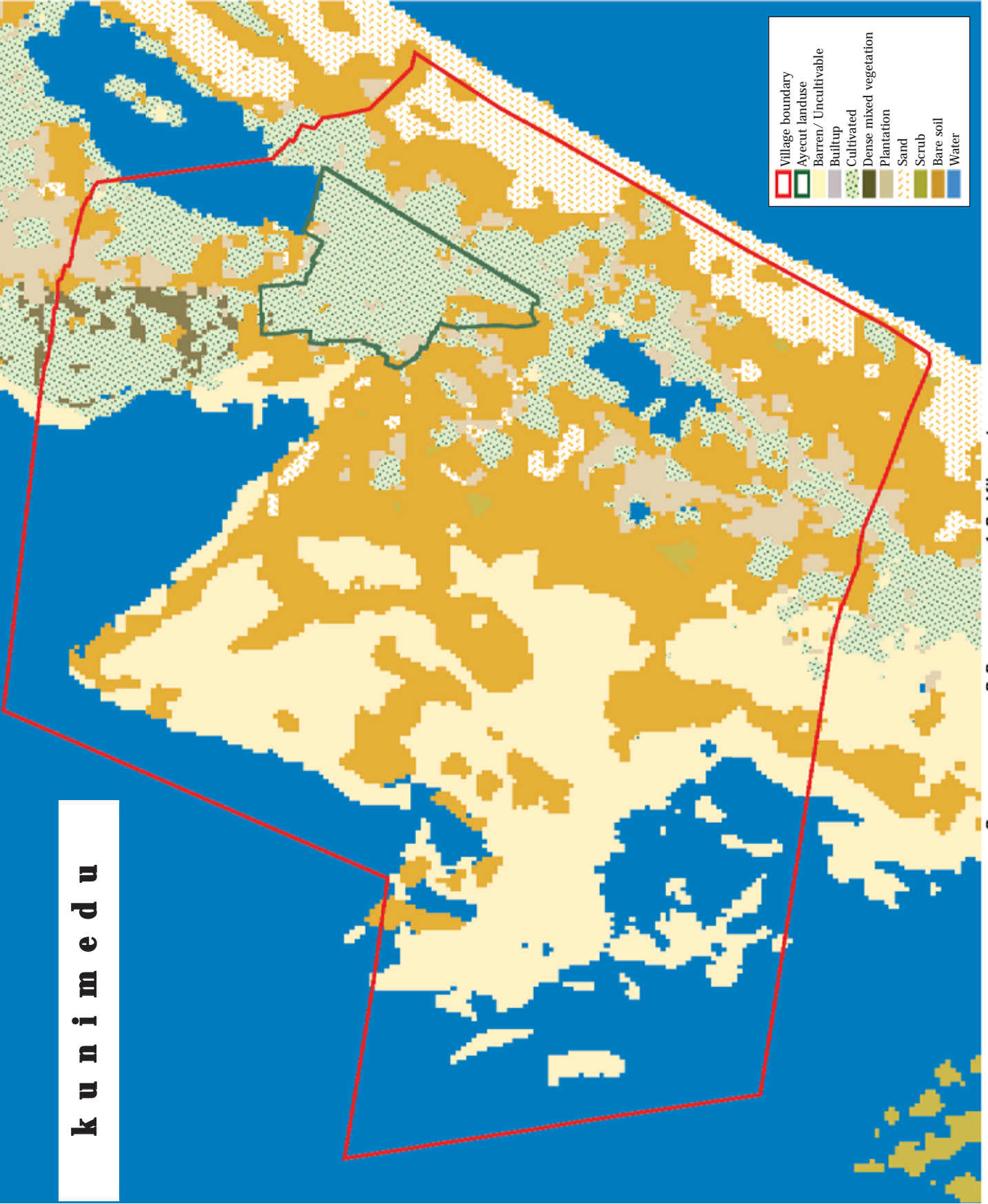
Women Puttadaar Groups

Institutional		
Number of groups: 2		
Group name	Ganga I	Ganga II
No of members	18	15
No of EC Members	4	1
No of Woman Puttadaar	5	5
Date of formation	04/08/2002	21/01/2003

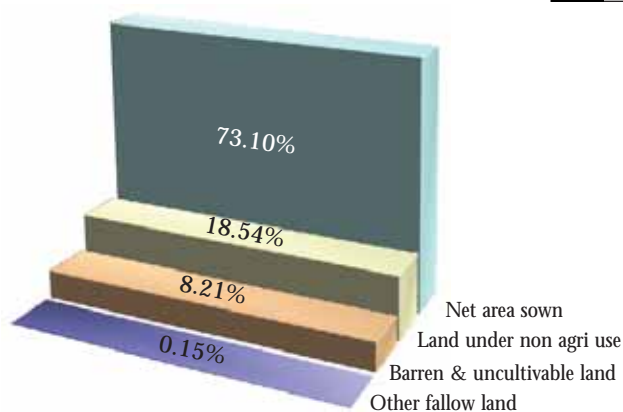
IGP	
Ganga I	Ganga II
Agriculture, Fish culture	

Financial (in Rs)		
	Ganga I	Ganga II
Savings	18750.00	15950.00
Loans	1750.00	8750.00

k u n i m e d u

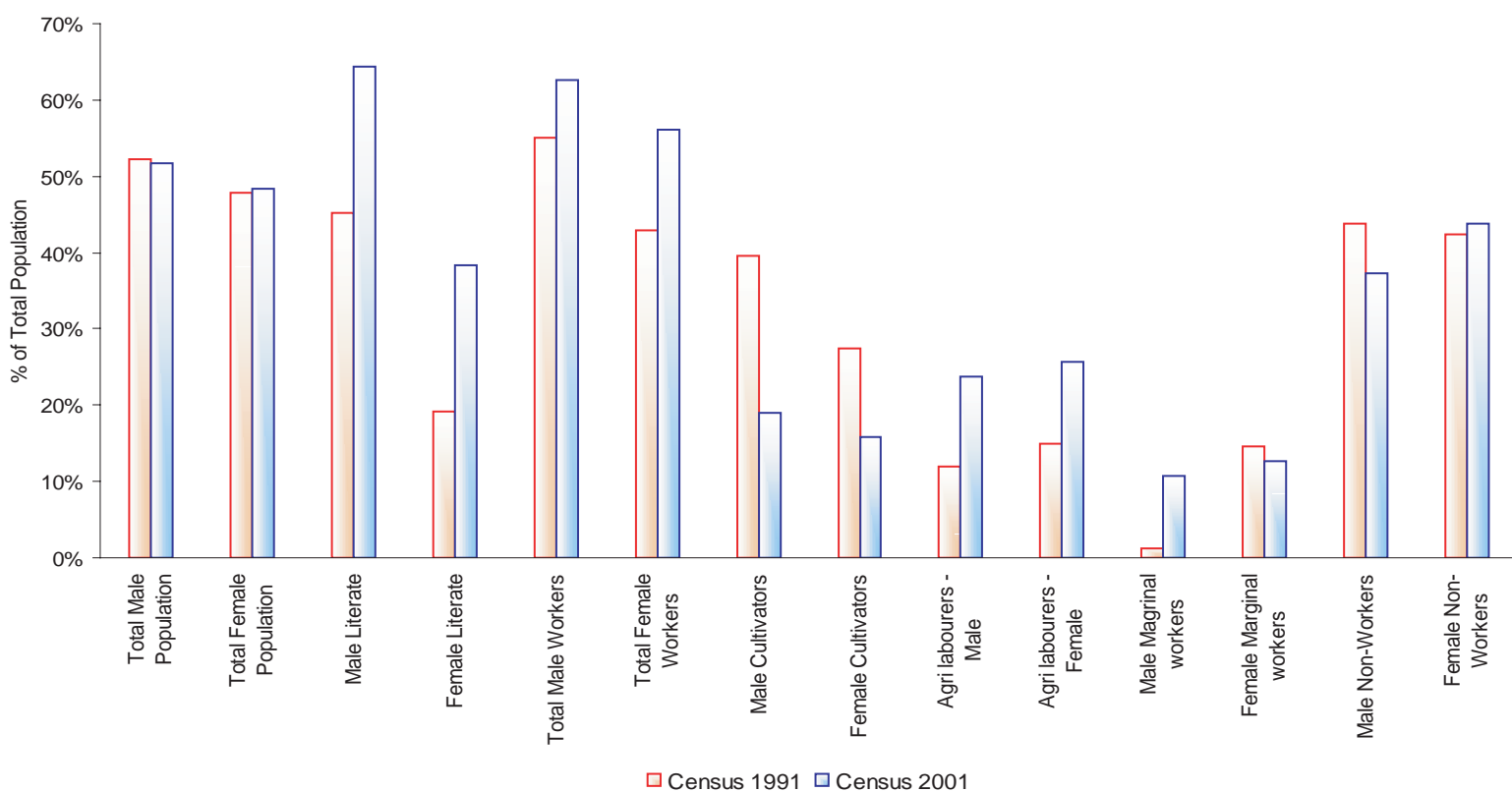


Kovadi



Initially there was not much of an interest from the farmers in taking up tank rehabilitation work as many of them have wells in the command area. There was also a misconception that ownership or management of the tank would pass onto Palmyra given that 70% of funds would be coming from the project. To win the trust of the community an entry level activity was carried out. The village pond was desilted with a small contribution coming in from the community. The formation of women SHGs early on in the village and the several activities taken up with them helped in further confidence building. Work on the tank started soon after. Once initial work was completed the interest in running an Association decreased and not much was done for a year. However, after an intense microplanning exercise, interest was regenerated and further work has been carried out. The farmers have taken up work on distribution channels in a major way so as to ensure water reaches the tail end and are also discussing construction of additional distribution channels. This is to ensure better water distribution and avoid cross-field irrigation. The WUA has encouraged and actively supported the various activities taken up the women groups. One of the SHGs has purchased a paddy threshing machine which they rent out to farmers. This is the first group to purchase farm machinery. The major gain recognised by the women in the SHGs and the WPGs is their increase in self confidence, the opportunity to meet a wide range of people and the ability to address their problems.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	04/05/2001
No of members	131
Total No of EC members	15
No women EC members	2
Total size of command	131.18

Fund mobilization (in Rs)	
Individual Farmer's fund	28263.00
Village Common Fund	113432.00
30% contribution	141695.00
70% contribution	330621.67
Total funds raised	472316.00

30%

Physical work		
	2001-2002	2003-2004
Desilting	-	7990m ³
Bund strengthening	-	1360m
Jungle clearance	6300m ²	-
Supply channel	2750m ³	-
Distribution channel	-	-
Sectioning in m	1020m	1360m
Construction	-	-
Increase in water capacity	-	0.28mcft

Farmer Profile	
> 1 acre	-
1 - 2.5 acres	-
> 2.5 acres	-

WSHG

Womens' Self Help Groups

Institutional		
Number of Groups: 2		
Group name	Thamarai	Roja
No of members	20	20
Date of formation	07/09/2000	07/09/2000

Financial (in Rs)	
Savings	69460.00
Loans	70250.00

Social activities	
Organised eye camp Kitchen garden and herbal medicine	

IGP	
	RF
Jointly	Threshing machine Agriculture
Individual	Goat

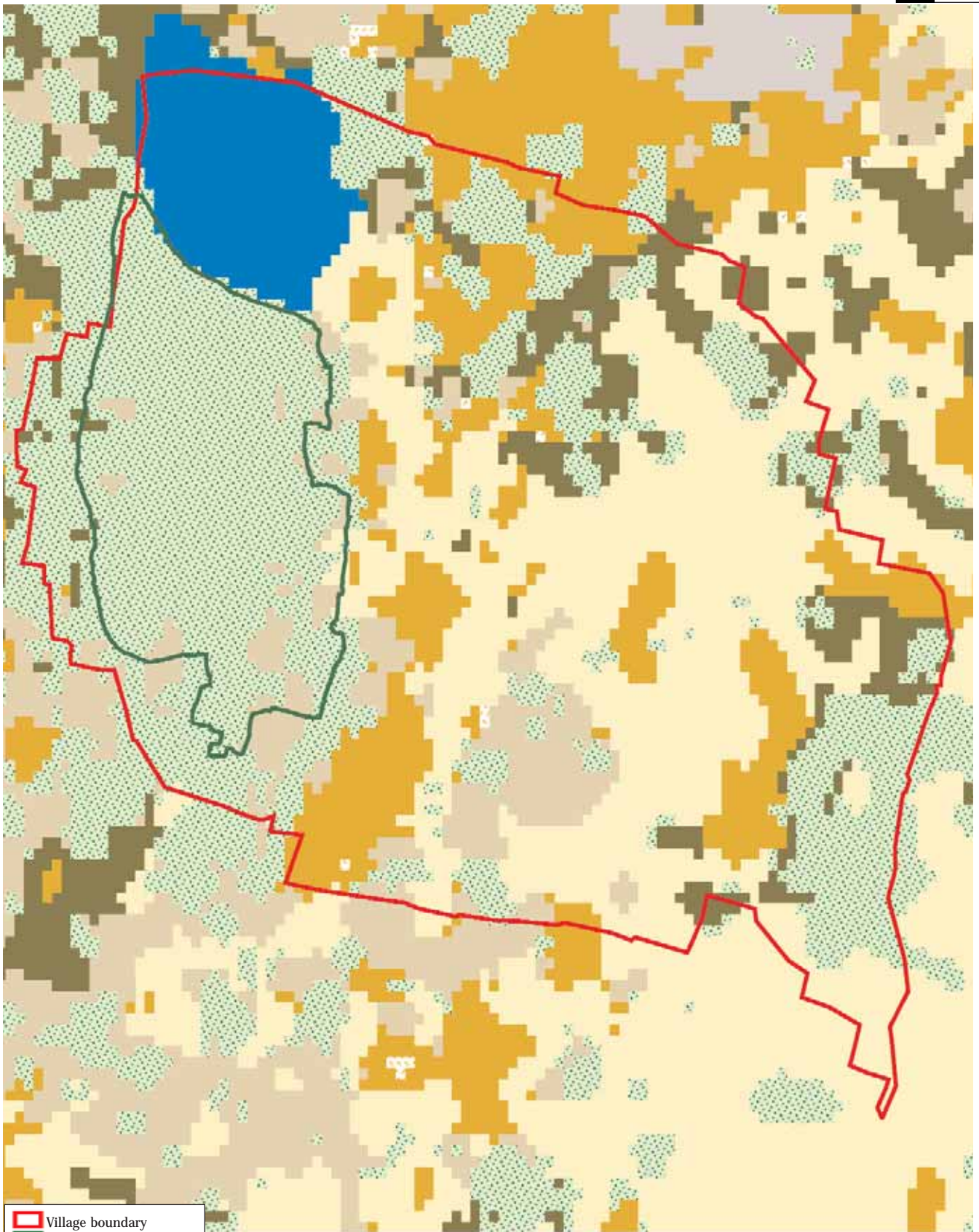
WPG

Women Puttadaar Groups

Institutional	
Group name	Nerkathir
No of members	20
No of EC Members	2
No of Woman Puttadaar	6
Date of formation	21/11/2002

IGP	Panchakaviyam foliar spray
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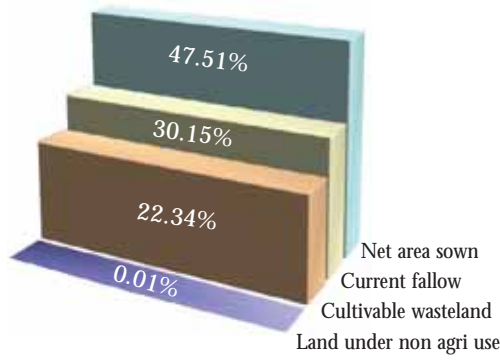
Financial (in Rs)	
Savings	36100.00
Loans	31550.00



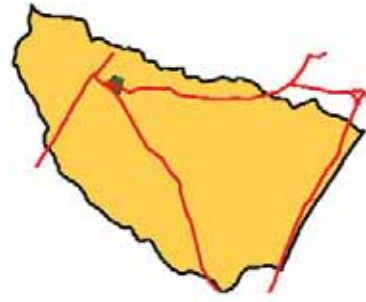
- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 600 1200 Meters

K o v a d i

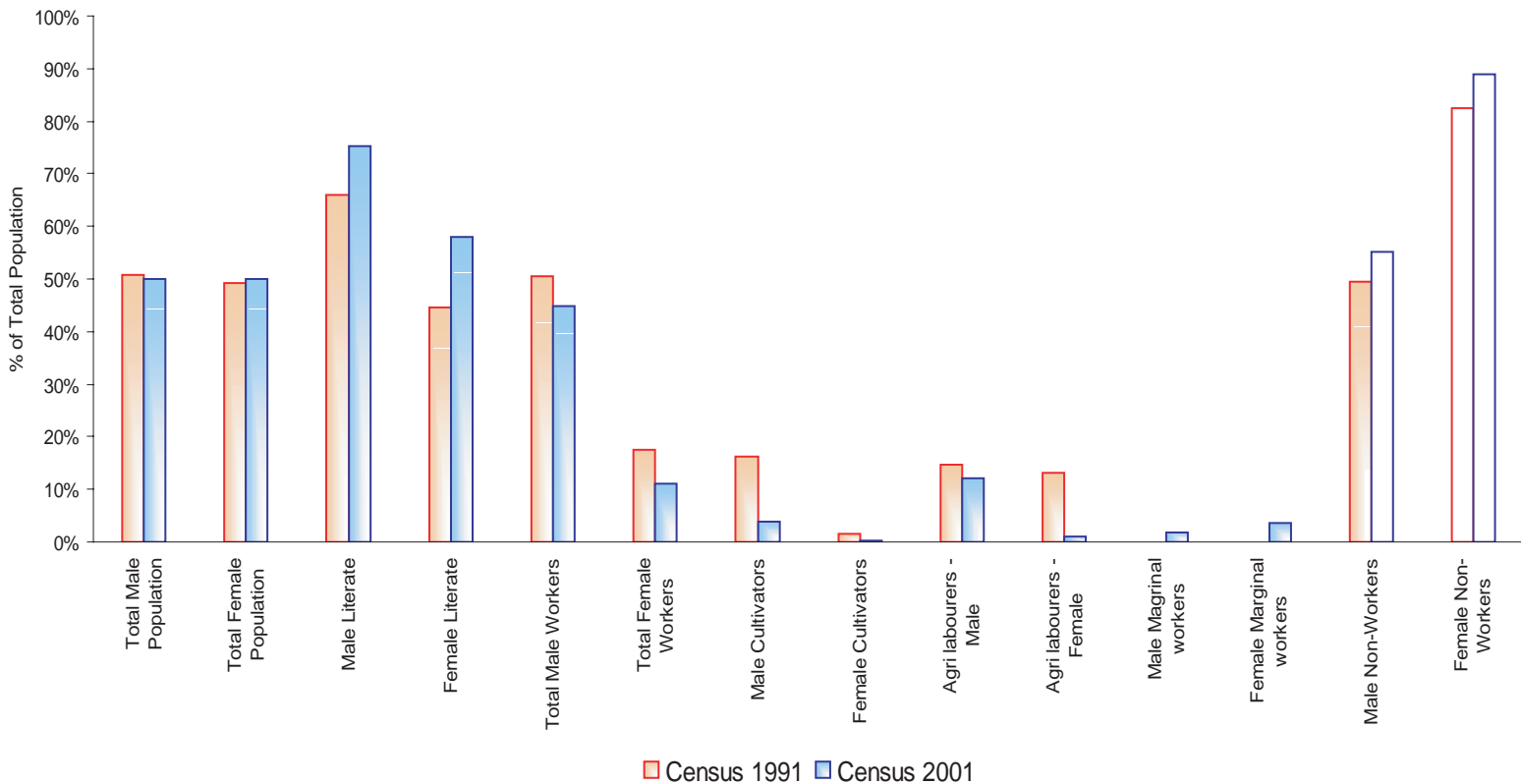


Manur



This small interior village has mostly small farmers (87% having less than 2.5 acres). Many of them are also agricultural labourers. The village also has no resources to contribute from the village common fund. Thus it was an uphill task to convince the farmers to contribute towards the rehabilitation activities. The PRA exercises and the exposure visits played a very important role in getting farmers involved. The main activity they have taken up is the improvement of the supply channel. An interesting feature of this Association is that a non-command farmer has played a pro-active role in organising the farmers. He is also involved in the day to day running of the Association and helps them maintain their record books.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	07/11/2000
No of members	61
Total No of EC members	11
No women EC members	2
Total size of command	84.79

30%

Fund mobilization (in Rs)	
Individual Farmer's fund	23350.00
Village Common Fund	4085.00
30% contribution	27435.00
70% contribution	64015.00
Total funds raised	91450.00

Physical work	
-	2002-2003
Desilting	-
Bund strengthening	-
Jungle clearance	-
Supply channel	-
Distribution channel	1470
Sectioning in m	-
Construction	-
Increase in water capacity	-

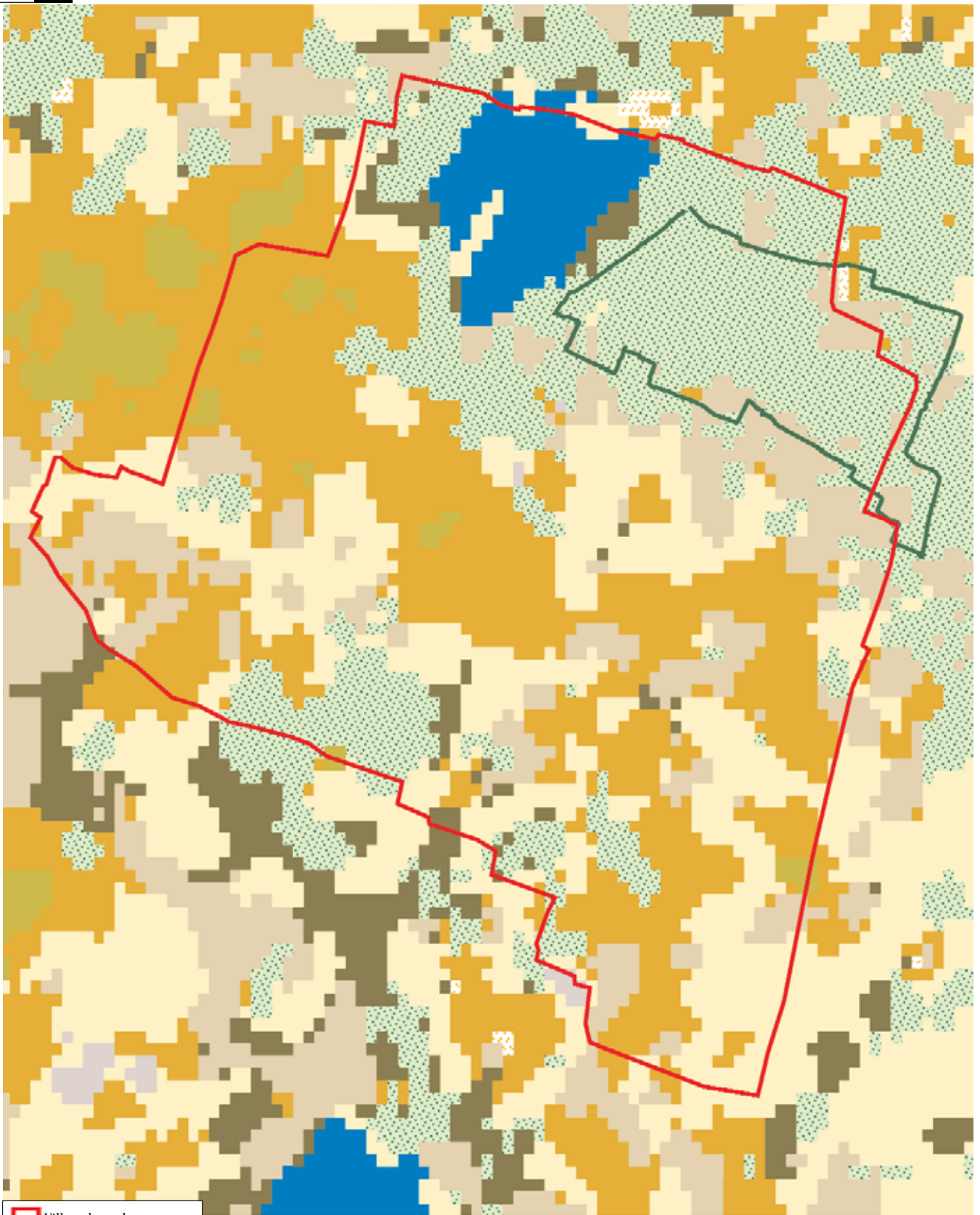
Farmer Profile	
> 1 acre	42
1 - 2.5 acres	11
> 2.5 acres	8

WSHG

Womens' Self Help Groups

Institutional		
Number of Groups: 2		
Group name	Jothi	Ambedkar
No of members	15	15
Date of formation	06/09/2000	04/08/2000

Financial (in Rs)	
Savings	59400.00
Loans	74400.00

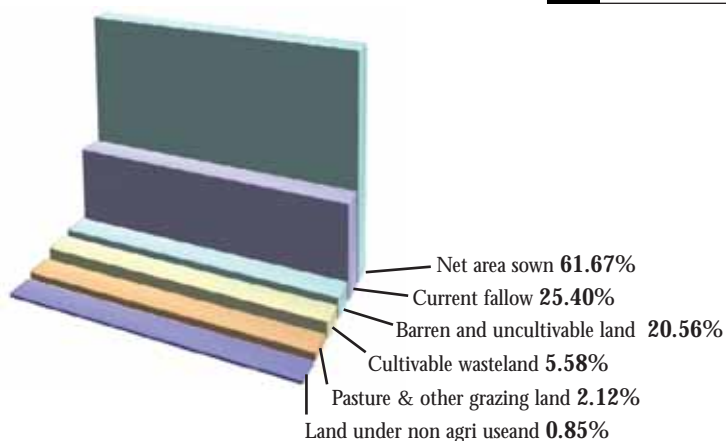


- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 500 1000 Meters

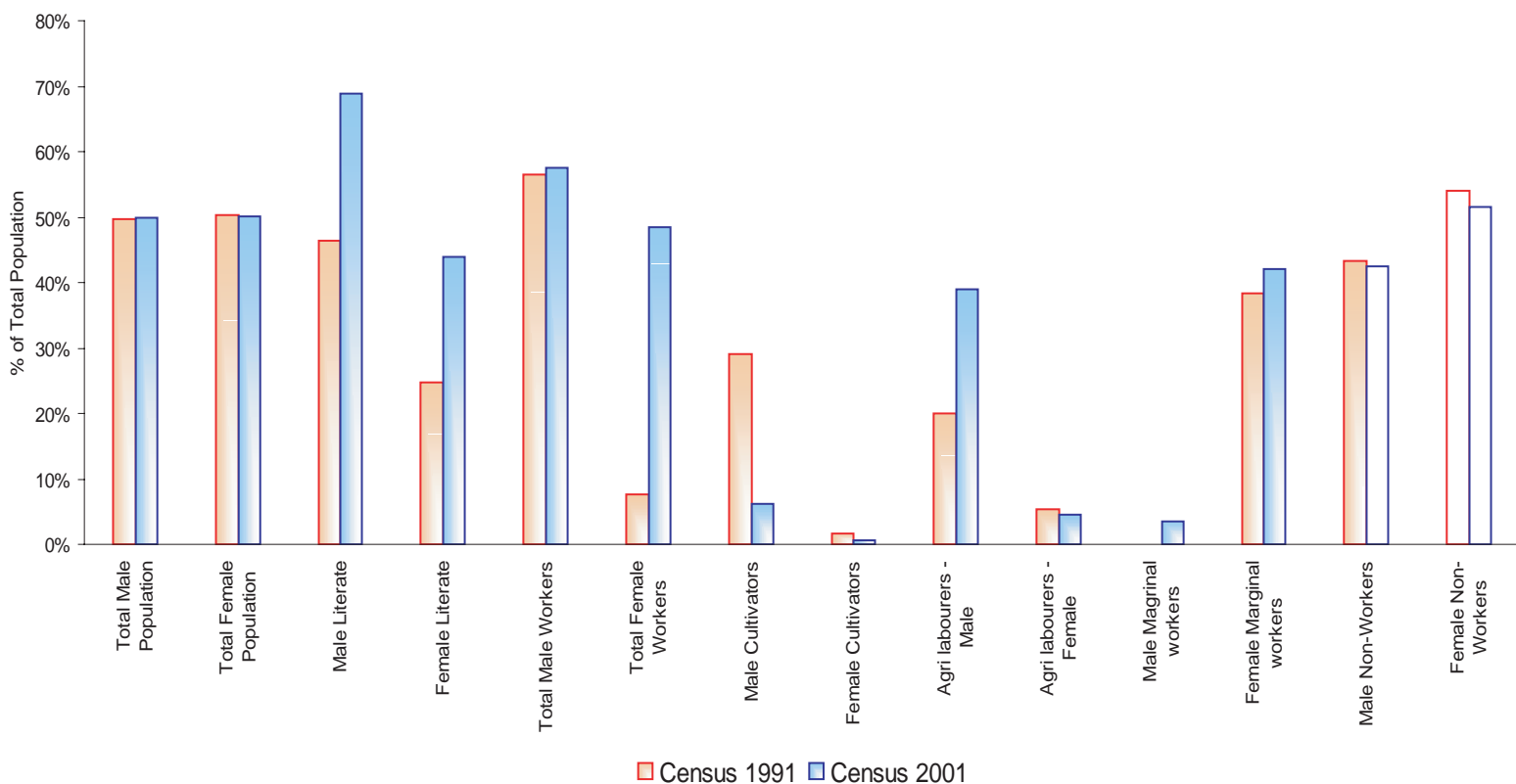
Manur

Molasur



This village situated on the highway close to Tindivanam had initial problems of coming together. Many of the command area farmers are dalits and problems centered around contributions from the two sections of society. However, one of the large influential farmers, owning about a 100 acres in the family came forward to start the collection drive. He provided his JCB for work in lieu of his contribution amount. The cost of this worked out to a little more than the Rs.300/- per acre which had been asked as the contribution from individual farmers. This helped the Association initiate rehabilitation work. Being a large tank (command of 290 acres), the farmers also had initial disagreements in what activities needed to be taken up. They then agreed to start with the basics of ensuring water reaching the tank and storage area cleared of weeds. Further work is being planned by the Association.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	29/05/2000
No of members	115
Total No of EC members	15
No women EC members	2
Total size of command	290.15

Fund mobilization (in Rs)	
Individual Farmer's fund	33375.00
Village Common Fund	134310.00
30% contribution	167685.00
70% contribution	391265.00
Total funds raised	558950.00

30%

Physical work		
	2001-2002	2003-2004
Desilting	-	-
Bund strengthening	-	-
Jungle clearance	14144m ²	200m ²
Supply channel	10000m ³	100m ³
Distribution channel	-	-
Sectioning in m	2200m	-
Construction	-	-
Increase in water capacity	-	-

Farmer Profile	
> 1 acre	69
1 - 2.5 acres	19
> 2.5 acres	27

WSHG

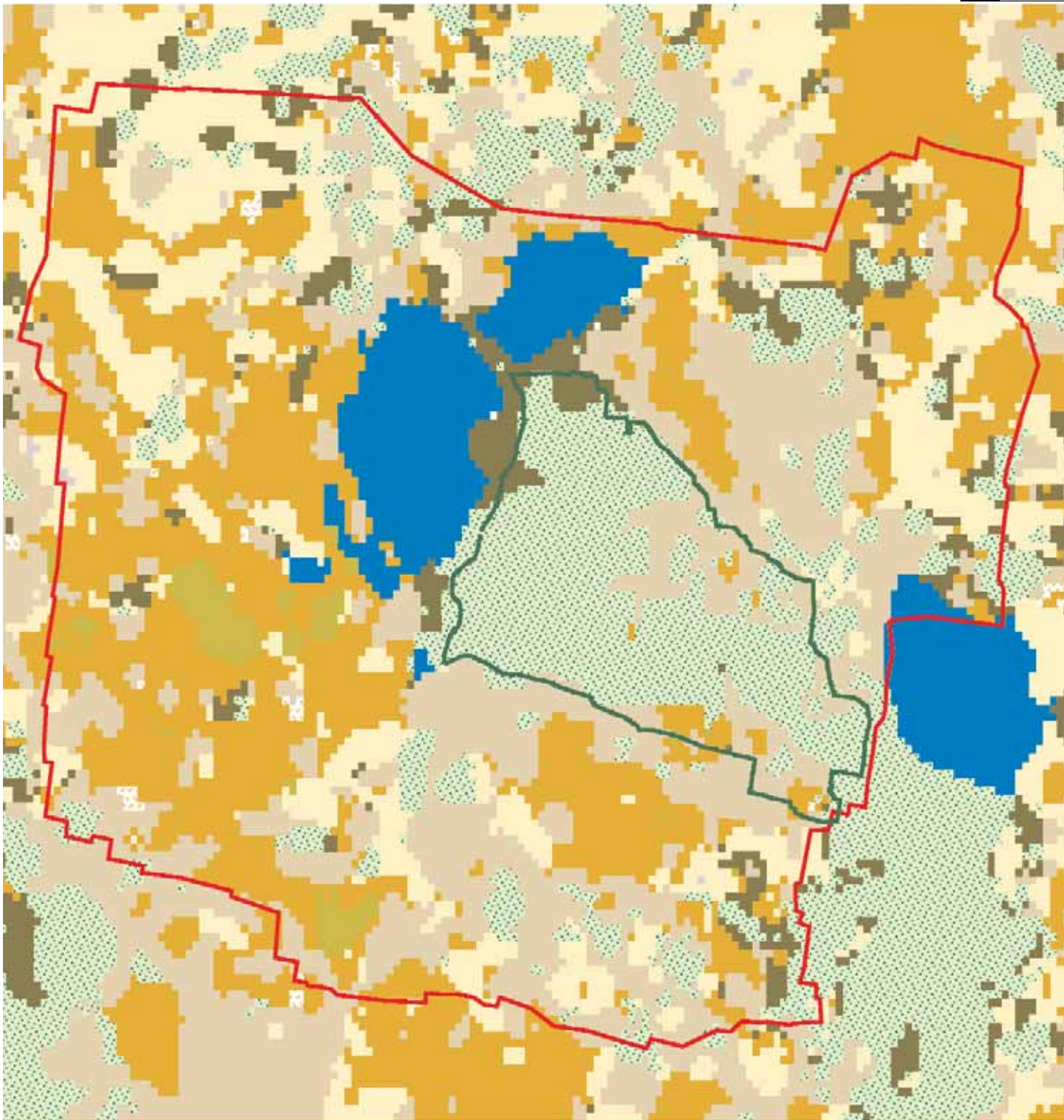
Womens' Self Help Groups












Institutional		
Number of Groups: 2		
Group name	Deepam	Maharantham
No of members	20	20
Date of formation	20/04/2001	03/08/2000

Financial (in Rs)	
Savings	115650.00
Loans	87500.00

Social activities
Organised eye camp Kitchen garden and herbal medicine Plantation on tank bund Well cleaning

IGP	
Jointly	Goat
Individual	

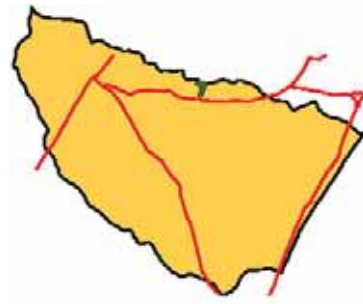
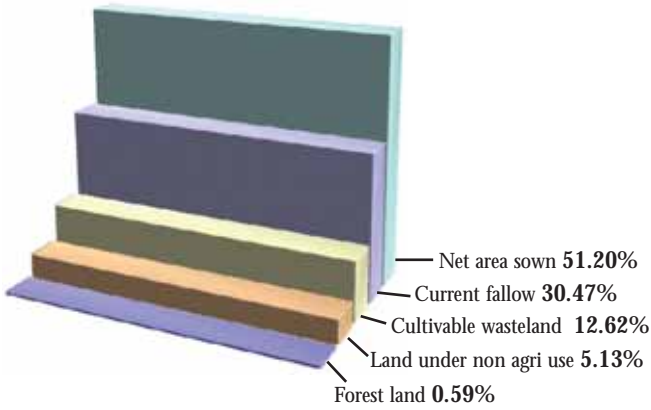


-  Village boundary
-  Ayecut landuse
-  Barren/ Uncultivable
-  Builtup
-  Cultivated
-  Dense mixed vegetation
-  Plantation
-  Sand
-  Scrub
-  Bare soil
-  Water

0 800 1600 Meters

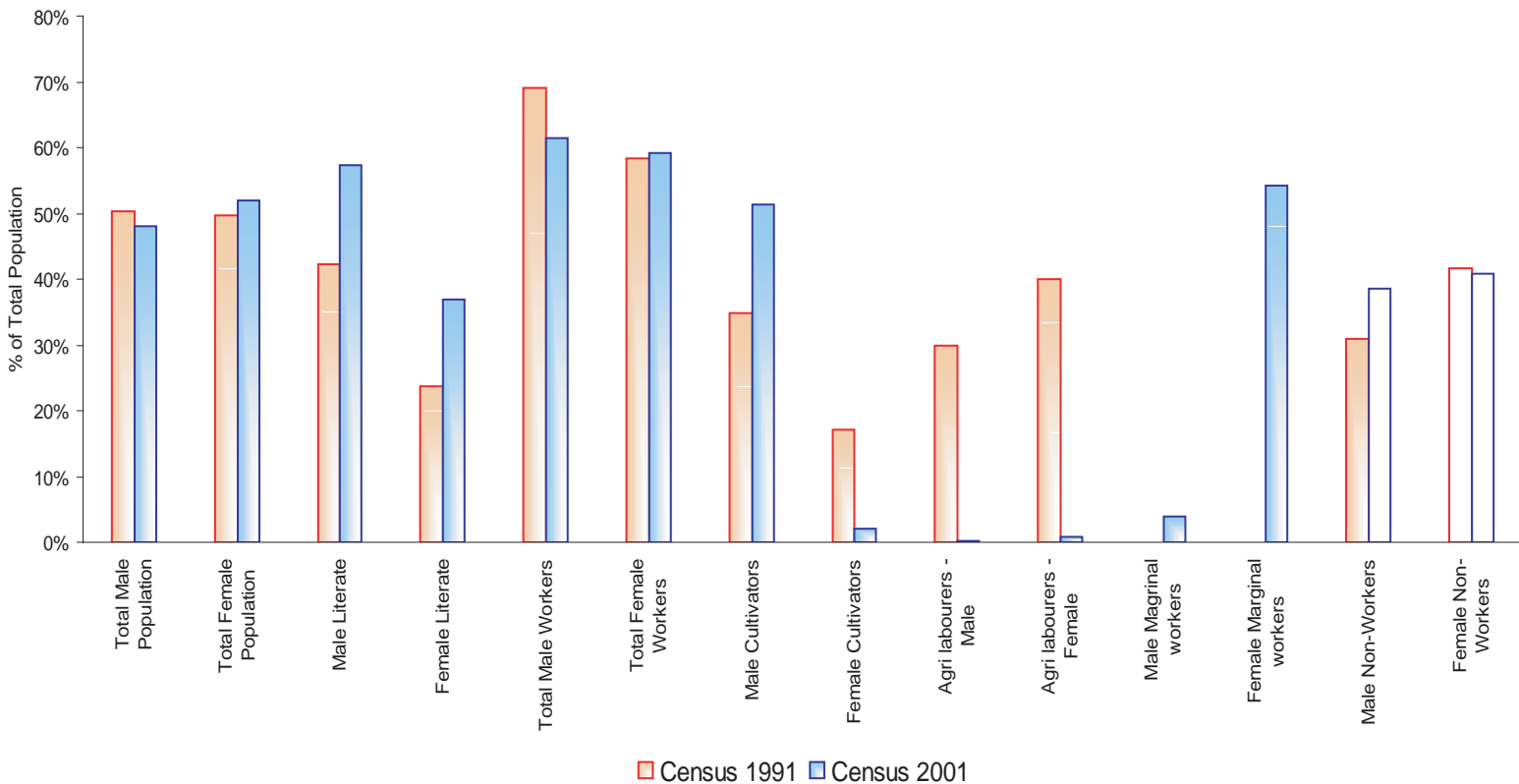
M o l a s u

Nalmukkal



The tank in Nalmukkal has farmers from two other villages, Sokkanthangal and Vallakulam. This is first instance where farmers from different villages were successfully brought together and not without a struggle. The ongoing project activity in the area and the poor state of their tank, convinced the farmers to work together and not lose this opportunity. A salient point is that all contribution has come from individual farmers and not the common fund of any of the villages. Thus, it has been a struggle for the motivated farmers and the project team in convincing other farmers and ensuring sizable amounts of rehabilitation work be carried out on the tank.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	23/12/2001
No of members	68
Total No of EC members	11
No women EC members	2
Total size of command	113.7

30%

Fund mobilization (in Rs)	
Individual Farmer's fund	28017.00
Village Common Fund	12975.00
30% contribution	40992.00
70% contribution	95648.00
Total funds raised	136640.00

Physical work	
-	2002-2003
Desilting	-
Bund strengthening	-
Jungle clearance	500m ²
Supply channel	2600m ³
Distribution channel	-
Sectioning in m	1010
Construction	Sluice
Increase in water capacity	-

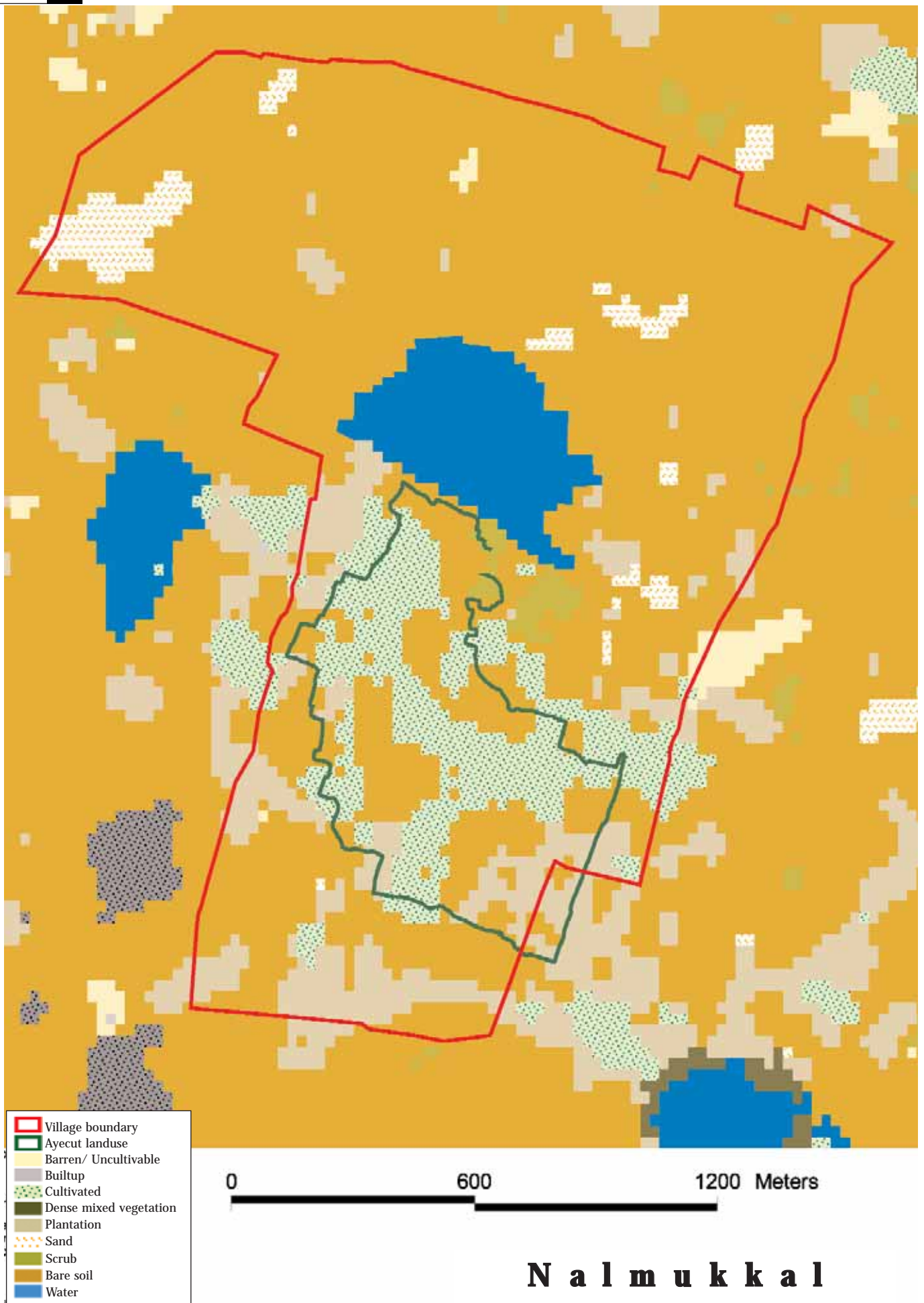
Farmer Profile	
> 1 acre	17
1 - 2.5 acres	41
> 2.5 acres	10

WSHG

Womens' Self Help Groups

Institutional	
Group name	Vazhaimaram
No of members	20
Date of formation	24/05/2001

Financial (in Rs)	
Savings	39350.00
Loans	40900.00

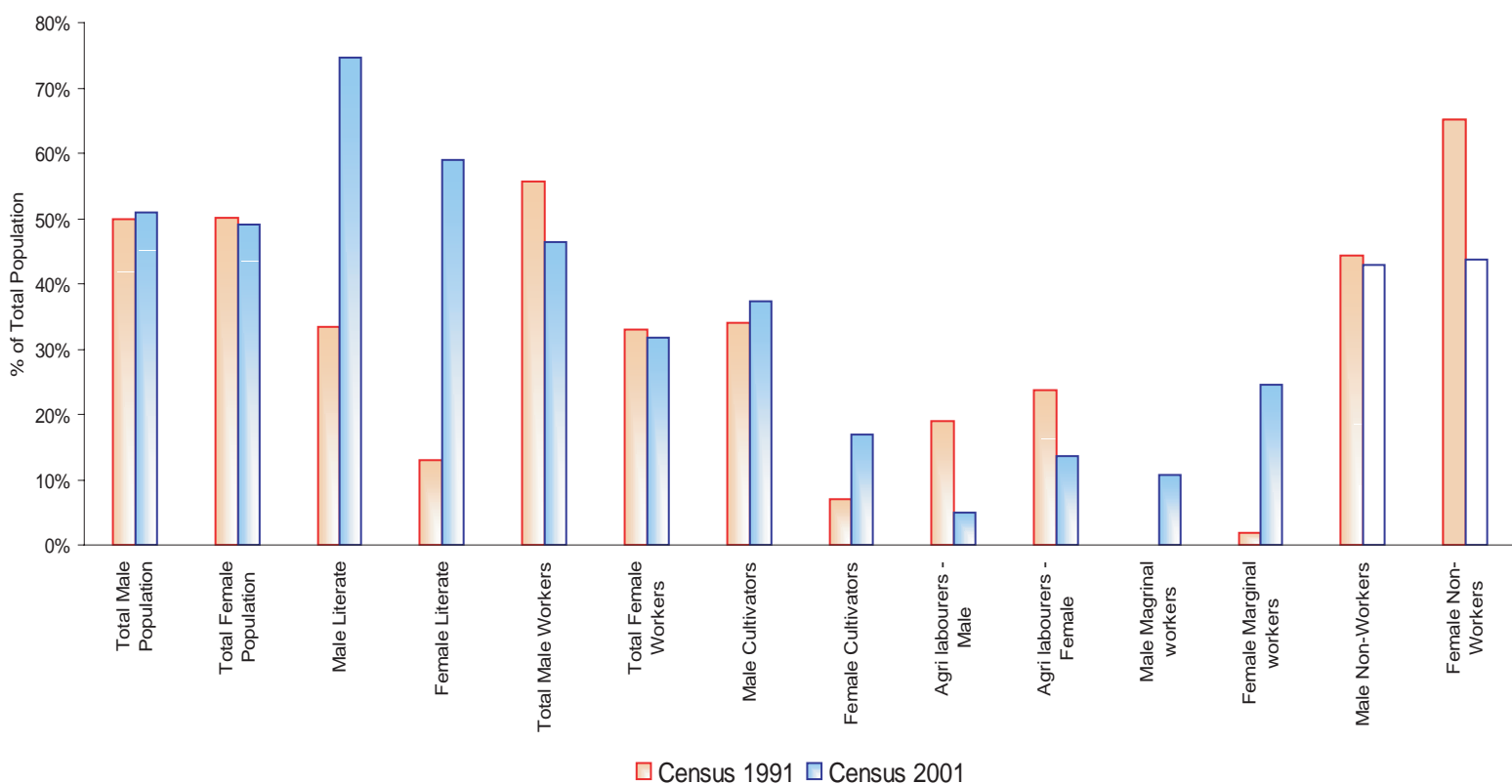


Kilappakkam



This small hamlet of the village Kilapakkam was the first to approach Palmyra to de-silt their 'Maduvu' (Channel). In a sense, it was this village which kick-started the mobilization process for the entire project. They however struggled to collect the contribution amounts. The Association was formed under the SPEF project in 1999 and work was done in two phases - 2000 and 2002. While there is still no system in place for water management, they recognize the need for one mainly due to crop failure despite plenty of water. Farmers cropped about one and half times the command area in the beginning and there was no control on the amount of water pumped out. Thus many were left without sufficient irrigation at the end of the season. The women groups have grown from strength to strength, initiating several activities for group members as well as the village. From no assured access to drinking water, they now have an overhead tank built through DANIDA funds. A bus comes to the village, thus saving people a 5 km walk. The women have also set up a fertilizer shop serving their own needs and that of neighbouring villages which are away from any market.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	22/10/1999
No of members	105
Total No of EC members	11
No women EC members	2
Total size of command	182.45

Fund mobilization (in Rs)	
Individual Farmer's fund	164820.00
Village Common Fund	211665.00
30% contribution	376485.00
70% contribution	878465.00
Total funds raised	1254950.00

30%

Physical work			
	2000-01	2002-03	2003-04
-			
Desilting	42100m ³	9100m ³	3600m ³
Bund strengthening	710m	300m	-
Jungle clearance	8800m ²	1500m ²	-
Supply channel	-	-	-
Distribution channel	-	-	-
Sectioning	-	1500m	-
Construction	Sluice	-	-
Increase in water capacity	1.48	0.32	0.13

Farmer Profile	
> 1 acre	30
1 - 2.5 acres	55
> 2.5 acres	20

WSHG

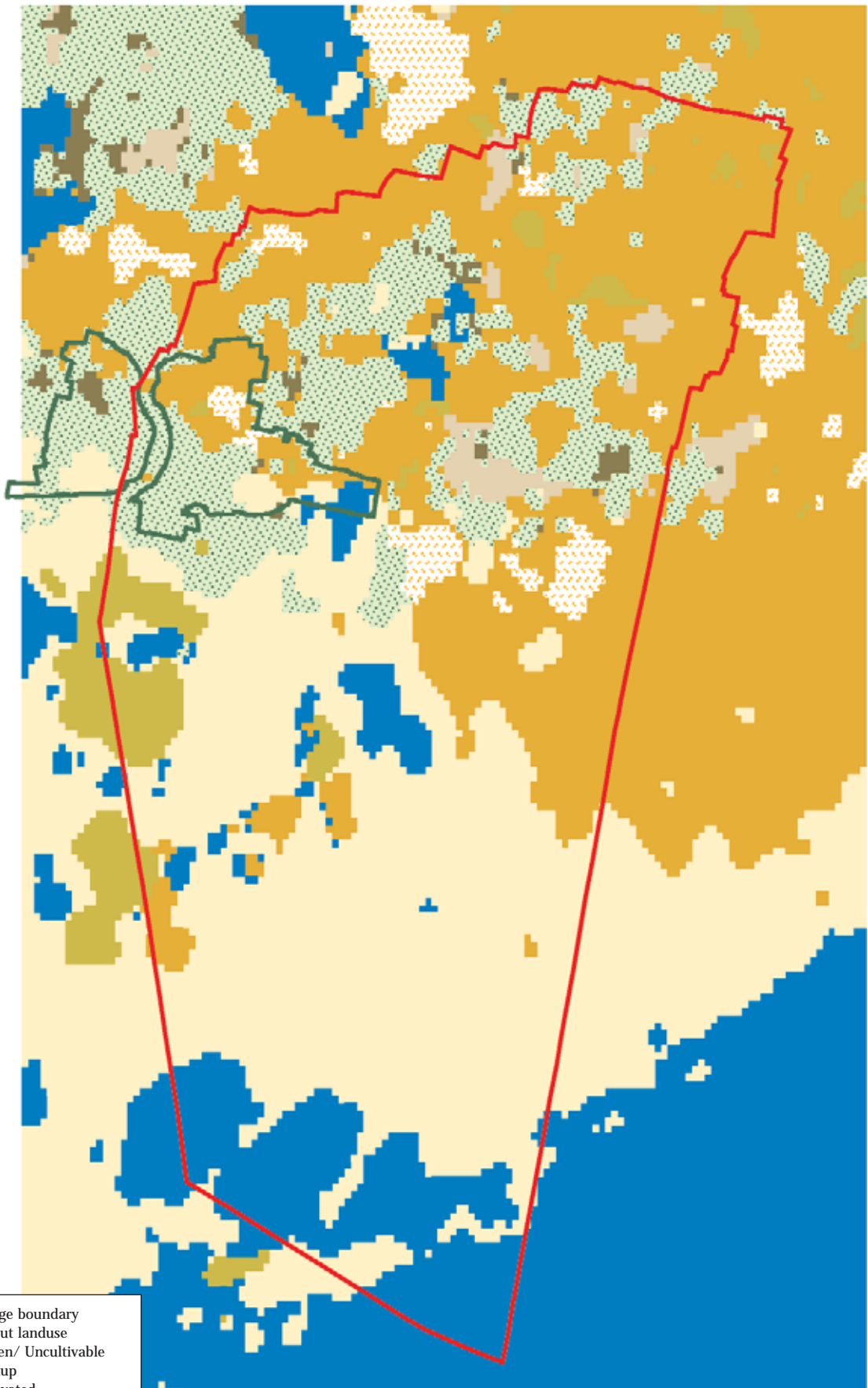
Womens' Self Help Groups

Institutional		
Number of Groups: 2		
Group name	Thamarai	Mullai
No of members	20	18
Date of formation	20/01/2001	20/01/2001

Financial (in Rs)	
Savings	100980.00
Loans	166920.00

Social activities
Constructed OHT tank Organised eye camp Kitchen garden and herbal medicine Plantation on tank bund

IGP		
	EA	RF
Jointly	Threshing machine Fertilizer shop	
Individual		Agricultural inputs



- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

K i l a p p a k k a m

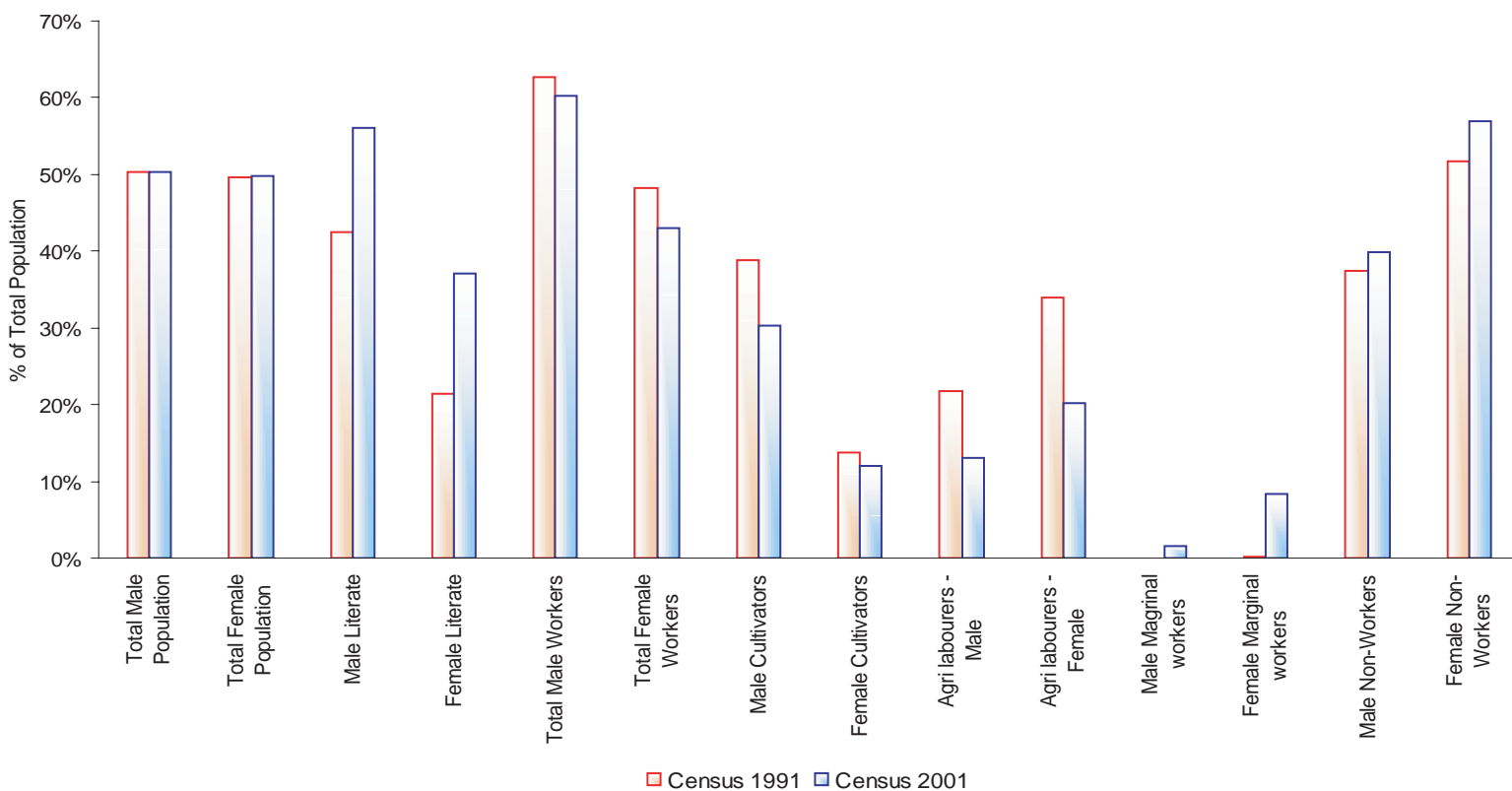
0 700 1400 Meters

Omandur



This village was contacted late in the project through the SHGs that had been initiated by a local bank. Initially, these women were more interested in rehabilitating their tank than the farmers themselves. They worked with the mobilisation team in changing the mindset of the farmers. They also contributed Rs.10,000 towards tank work. In the beginning, there were several conflicts and farmers did not come to a consensus on any issue. A more co-operative and interested Panchayat President and several youngsters who have become actively involved in the Association brought about the changes. The Association will be initiating work on the supply channels the coming summer.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	11/05/2002
No of members	188
Total No of EC members	15
No women EC members	4
Total size of command	194.47

Fund mobilization (in Rs)	
Individual Farmer's fund	45900.00
Village Common Fund	77217.00
30% contribution	123117.00
70% contribution	287273.00
Total funds raised	410390.00

30%

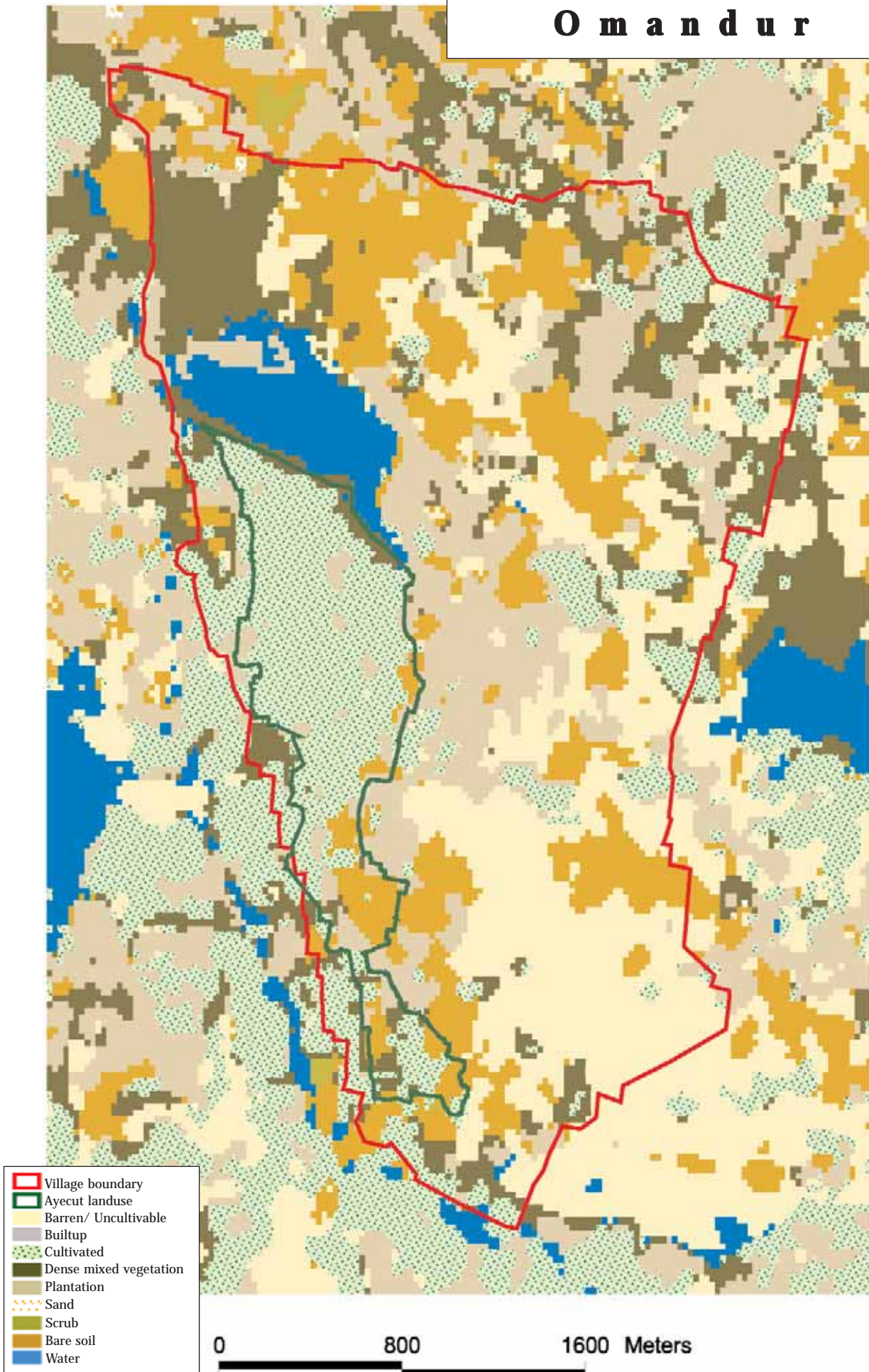
Physical work			
	1st Round	2nd Round	3rd Round
-	-	-	-
Desilting	-	-	-
Bund strengthening	-	-	-
Jungle clearance	-	-	-
Supply channel	-	-	-
Distribution channel	-	-	-
Sectioning in m	-	-	-
Construction	-	-	-
Increase in water capacity	-	-	-

Farmer Profile	
> 1 acre	110
1 - 2.5 acres	61
> 2.5 acres	17

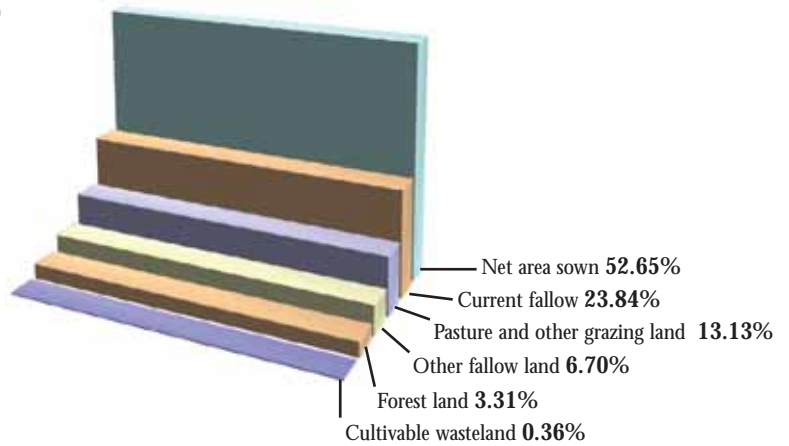
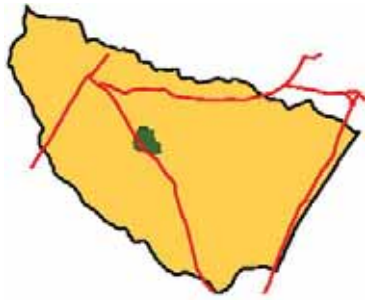
WSHG

Womens' Self Help Groups

O m a n d u r

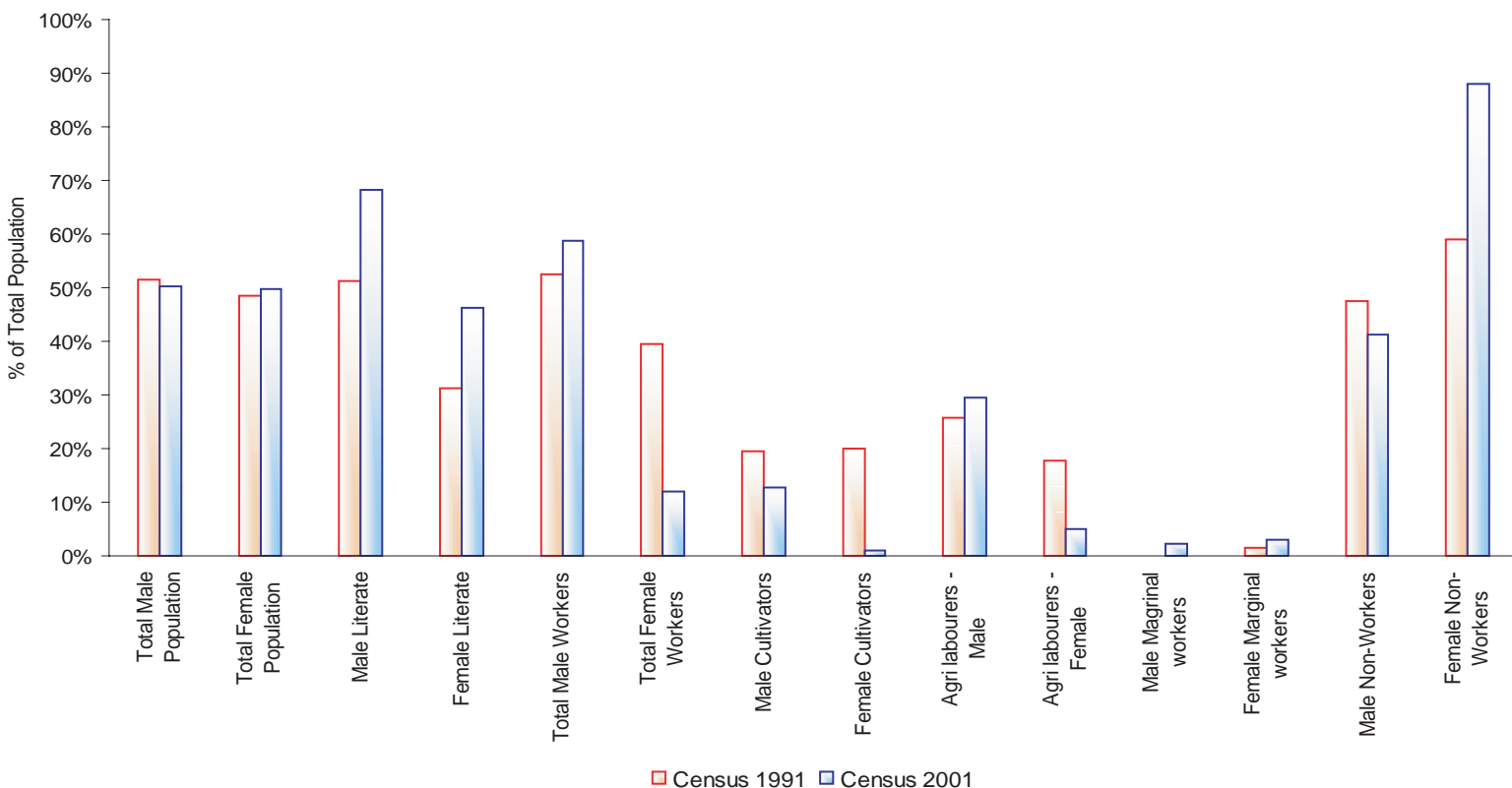


Kodippakkam(Ten)



This was the first village to initiate rehabilitation activities, even though several Associations had been formed earlier. While the contributions were almost entirely from the village common fund, they have the distinction of raising the maximum amount. The work done here also served as a site for other Associations to visit and be motivated. There are six women SHGs in the village which function in an effective and co-ordinated fashion. They are involved in several income generation activities ranging from sale of firewood to animal husbandry and floriculture. The confidence in their capacities is high - 'whatever task we take up, we are capable of completing it well'. The experiences in this village also served as a learning ground to project staff on the several issues related to rehabilitation activities and helped devise protocols for future work.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	31/01/2000
No of members	136
Total No of EC members	15
No women EC members	2
Total size of command	151.51

Fund mobilization (in Rs)	
Individual Farmer's fund	NA
Village Common Fund	575000.00
30% contribution	575000.00
70% contribution	1341666.67
Total funds raised	1916666.67

30%

Physical work	
	2000-2001
Desilting	27206m ³
Bund strengthening	2150m
Jungle clearance	1250m ²
Supply channel	1250m ³
Distribution channel	-
Sectioning in m	2150
Construction	Steps, Sluice repair
Increase in water capacity	-

Farmer Profile	
> 1 acre	85
1 - 2.5 acres	37
> 2.5 acres	14

WSHG

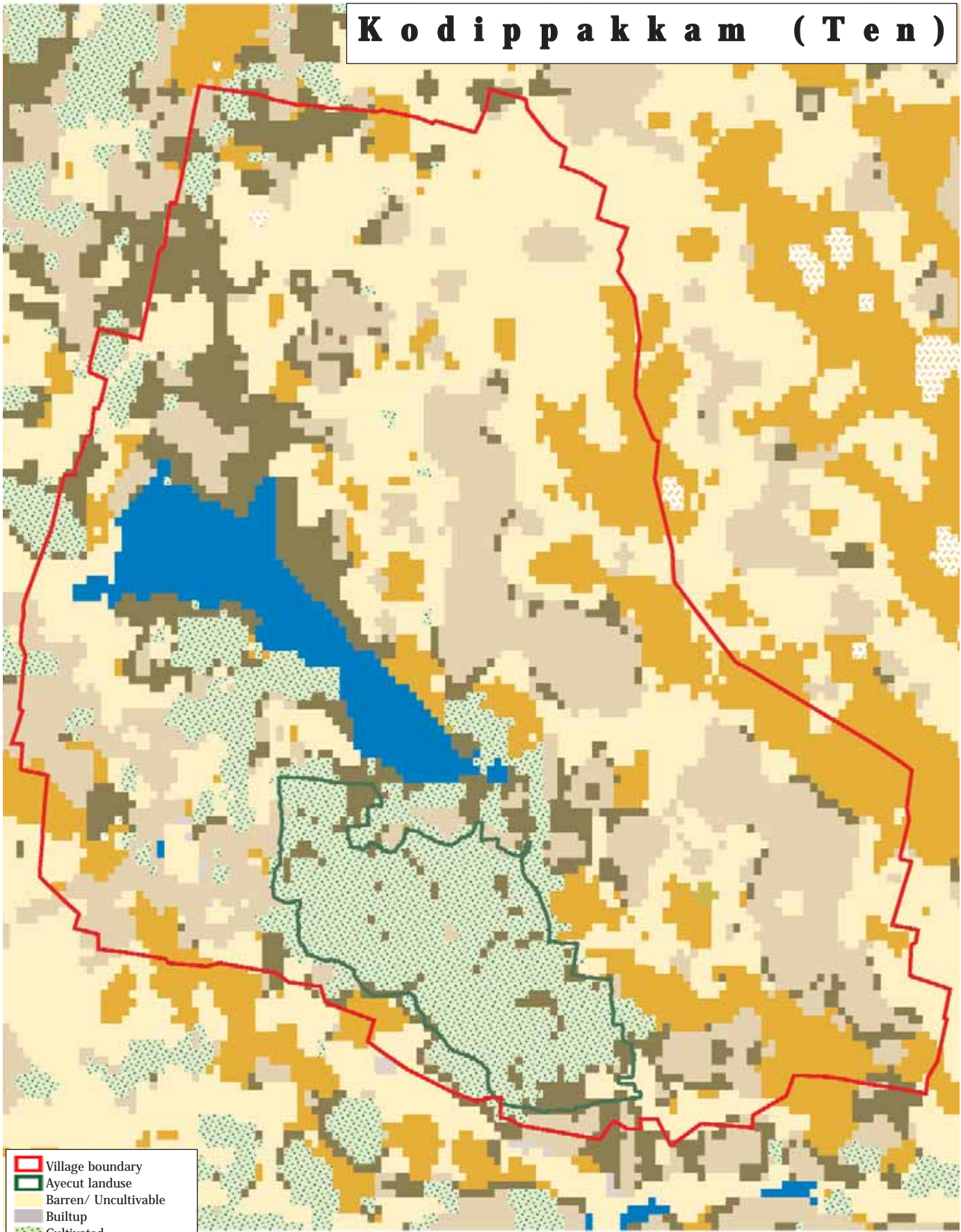
Womens' Self Help Groups

Institutional		
Number of Groups: 6		
Group name	No of members	Date of formation
Jathimalli	17	30/10/2000
Senbagapoo	20	27/10/2000
Vadamalli	20	27/10/2000
Suryagandhi	20	27/10/2000
Kamadhenu	20	17/04/2000
Annai	20	07/06/2001
Total	117	

Financial (in Rs)	
Savings	479180.00
Loans	558000.00

Social activities
Organised eye camp Kitchen garden and herbal medicine Plantation on tank bund Electricity connection Well cleaning

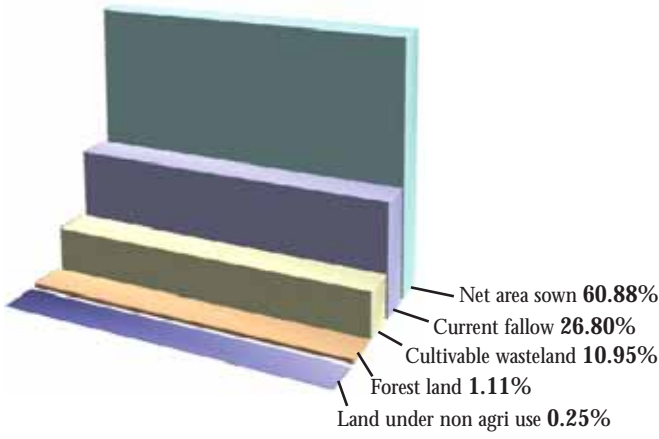
K o d i p p a k k a m (T e n)



- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

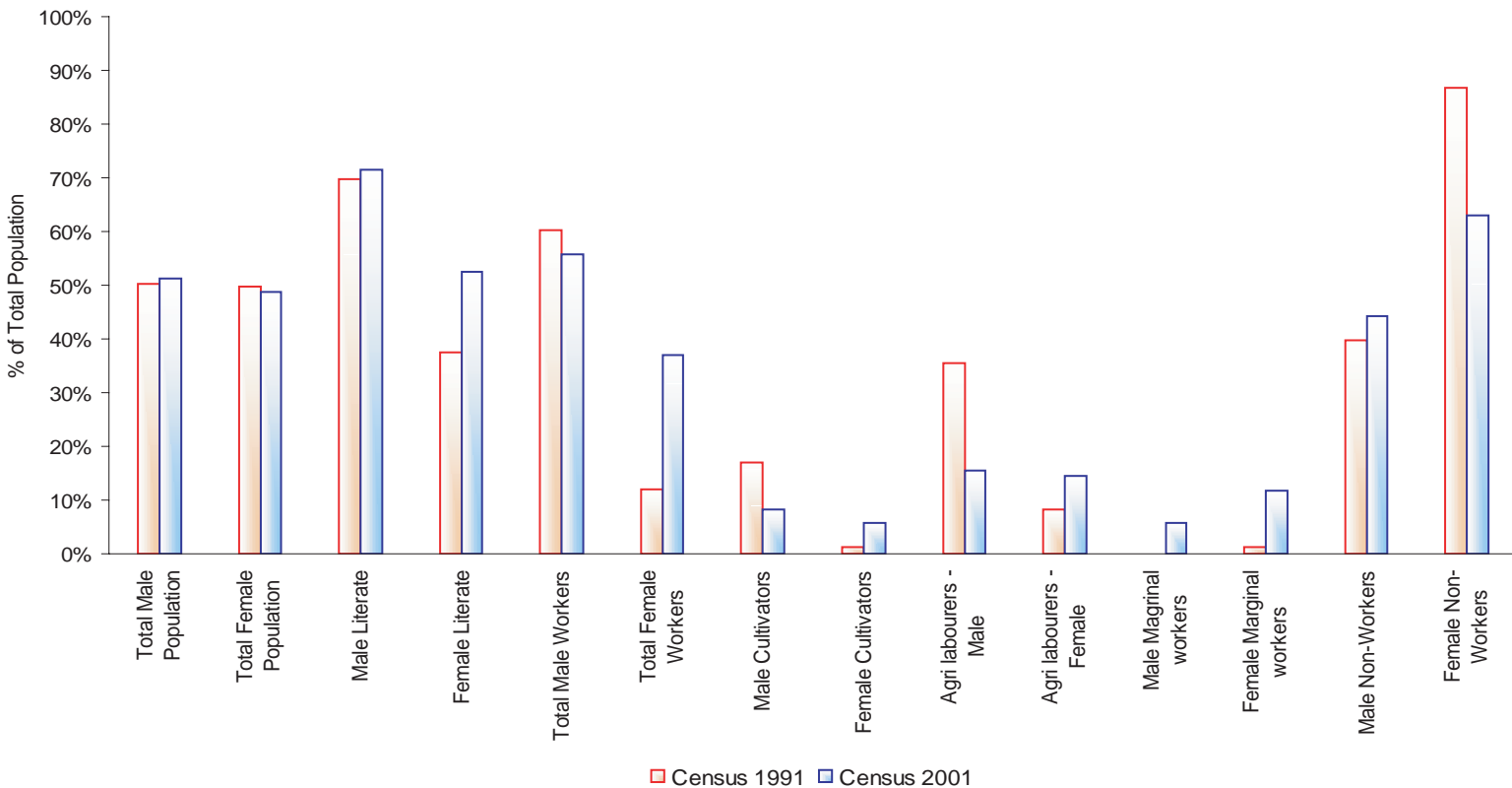
0 800 1600 Meters

Siruvalur (Ten)



The Association in this village was initially slow to function but picked up with the involvement of the Panchayat President in its activities. He helped restructure the Association and mobilised substantial contributions from the village common fund. An entry level activity, repair of local pond, was also carried out in which all households contributed fifty Rupees. While most of the farmers have been unable to contribute individually, the WPG members have ensured that they gave their contributions. The women have also initiated several trails of alternate crops and cropping practices in their fields.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	09/12/2001
No of members	206
Total No of EC members	11
No women EC members	2
Total size of command	357.5

Fund mobilization (in Rs)	
Individual Farmer's fund	5500.00
Village Common Fund	150808.00
30% contribution	156308.00
70% contribution	364718.67
Total funds raised	521026.67

30%

Physical work	
2002-2003	
Desilting	-
Bund strengthening	-
Jungle clearance	13920m ²
Supply channel	-
Distribution channel	-
Sectioning in m	-
Construction	Sluice, weir
Increase in water capacity	-

Farmer Profile	
> 1 acre	110
1 - 2.5 acres	67
> 2.5 acres	29

WPG

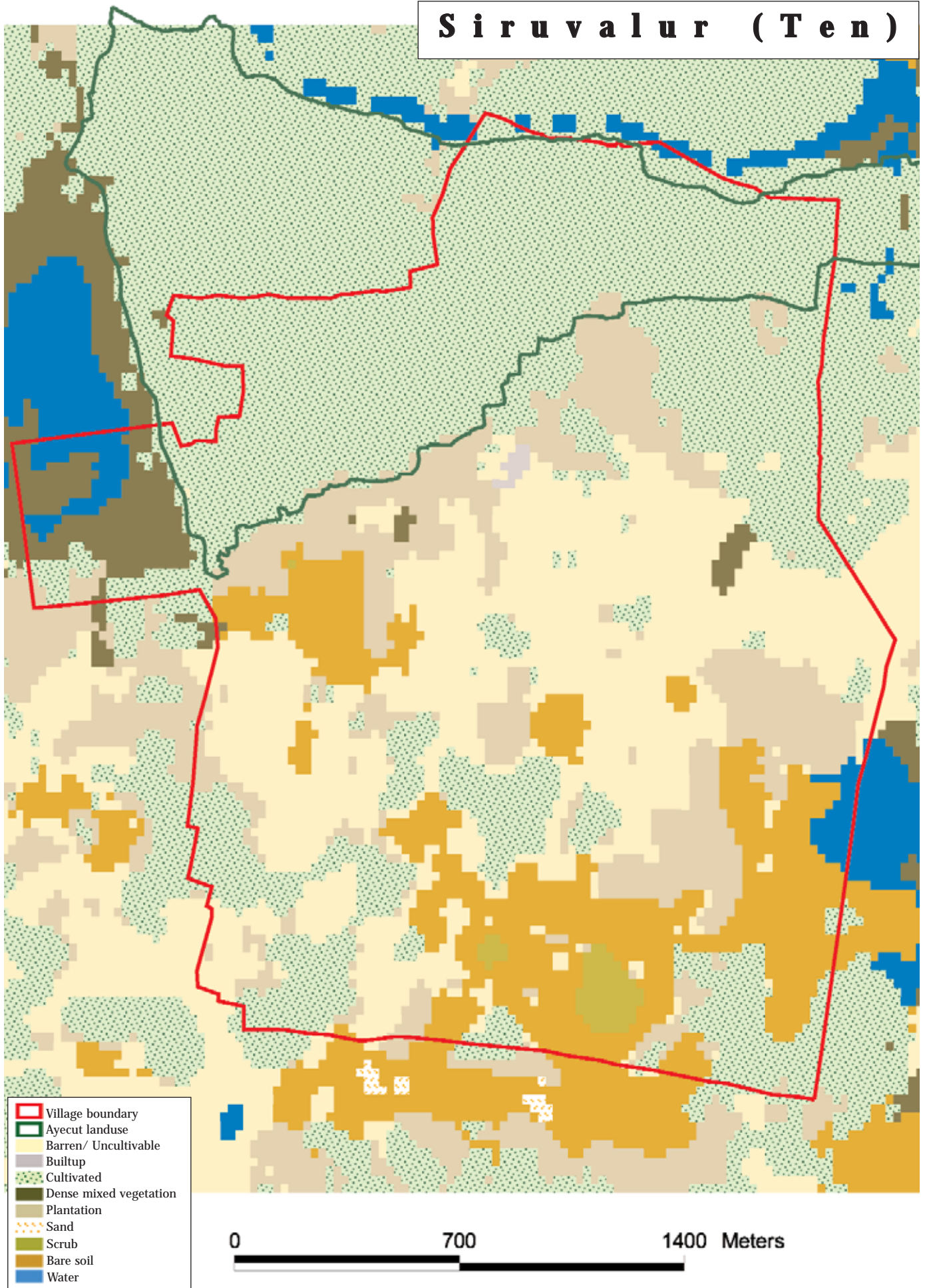
Women Puttadaar Groups

Institutional		
Number of Groups: 2		
Group name	Sindhunadhi I	Sindhunadhi II
No of members	20	20
No of EC members	1	1
No of WP members	8	6
Date of formation	07/03/03	17/03/03

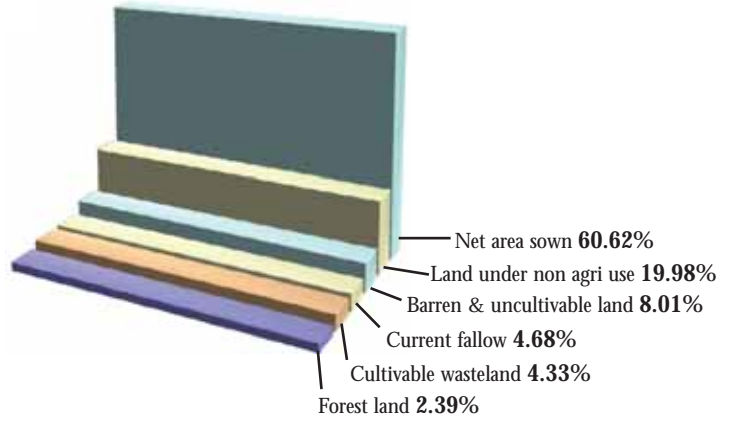
Financial		
Number of Groups: 2		
Group name	Sindhunadhi I	Sindhunadhi II
Savings loan	29800	30000
Loan	16950	12250

IGP	
Sindhunadhi I	Sindhunadhi II
Agriculture	Panchakaviyam foliar spray

Siruvalur (Ten)

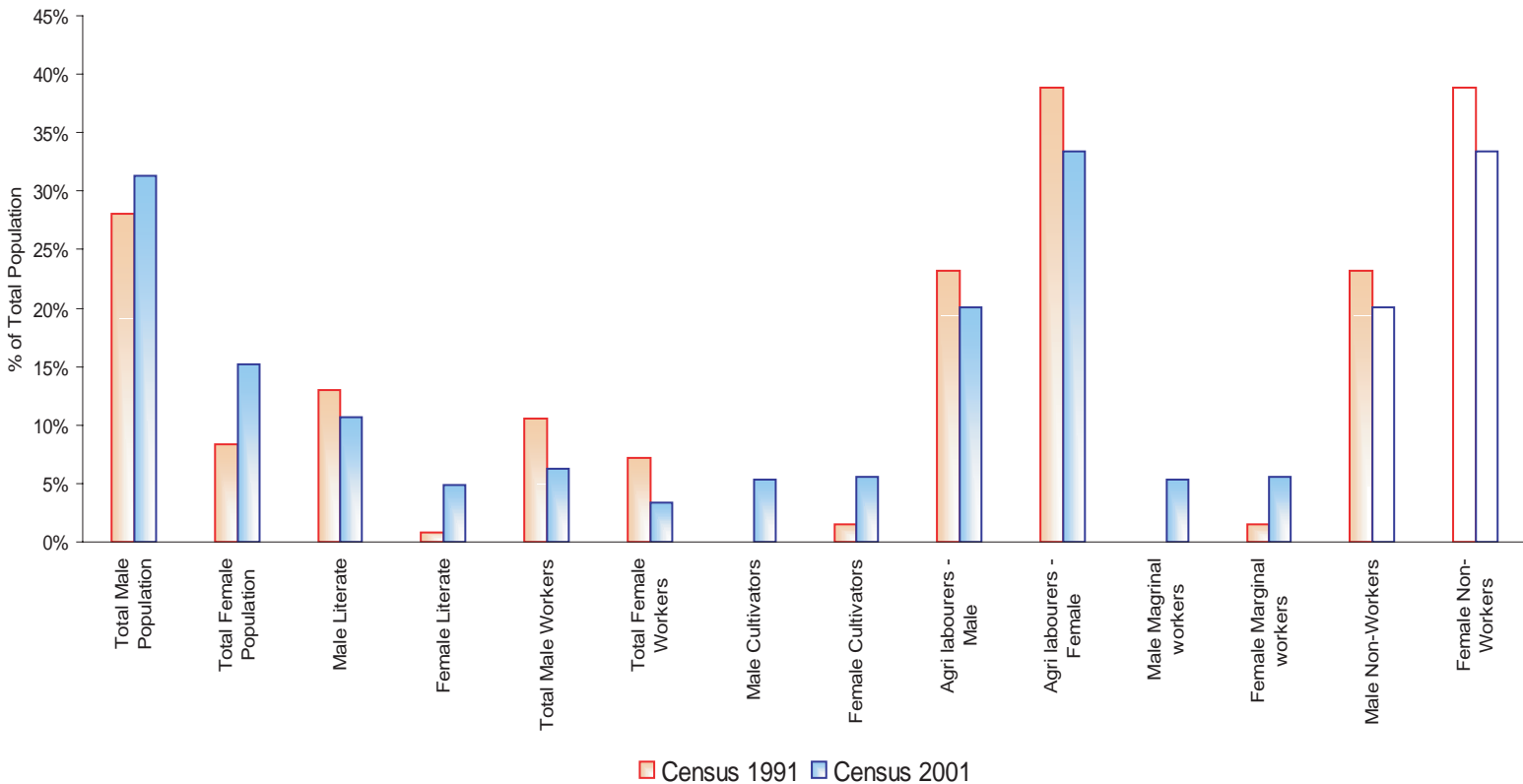


Terkunam



Initial problems in the village were that some of the major landholders in the command area were not interested in taking up rehabilitation activities and there were large number of groups within the village. These differences have been sorted out over time and the farmers have come together to accomplish large amounts of work. Basic sluice repair was carried out on their own. The women SHGs have also been very active. Access to loans has helped them take up several activities. The women have also learnt to read and write their names. According to the women their major achievement has been in shutting down of arrack brewing units within the village.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	01/09/2001
No of members	188
Total No of EC members	15
No women EC members	3
Total size of command	282.93

Fund mobilization (in Rs)	
Individual Farmer's fund	86750.00
Village Common Fund	119050.00
30% contribution	205800.00
70% contribution	480200.00
Total funds raised	686000.00

30%

Physical work	
	2003-2004
Desilting	4500m ³
Bund strengthening	1200m
Jungle clearance	-
Supply channel	-
Distribution channel	-
Sectioning in m	1200m
Construction	-
Increase in water capacity	0.16

Farmer Profile	
> 1 acre	84
1 - 2.5 acres	81
> 2.5 acres	23

WSHG

Womens' Self Help Groups

Institutional	
Group name	Vizhudugal
No of members	20
Date of formation	11/01/2001

Financial (in Rs)	
Savings Loan	63080.00
Loans	38000.00

IGP	
Jointly	Agriculture
Individual	-

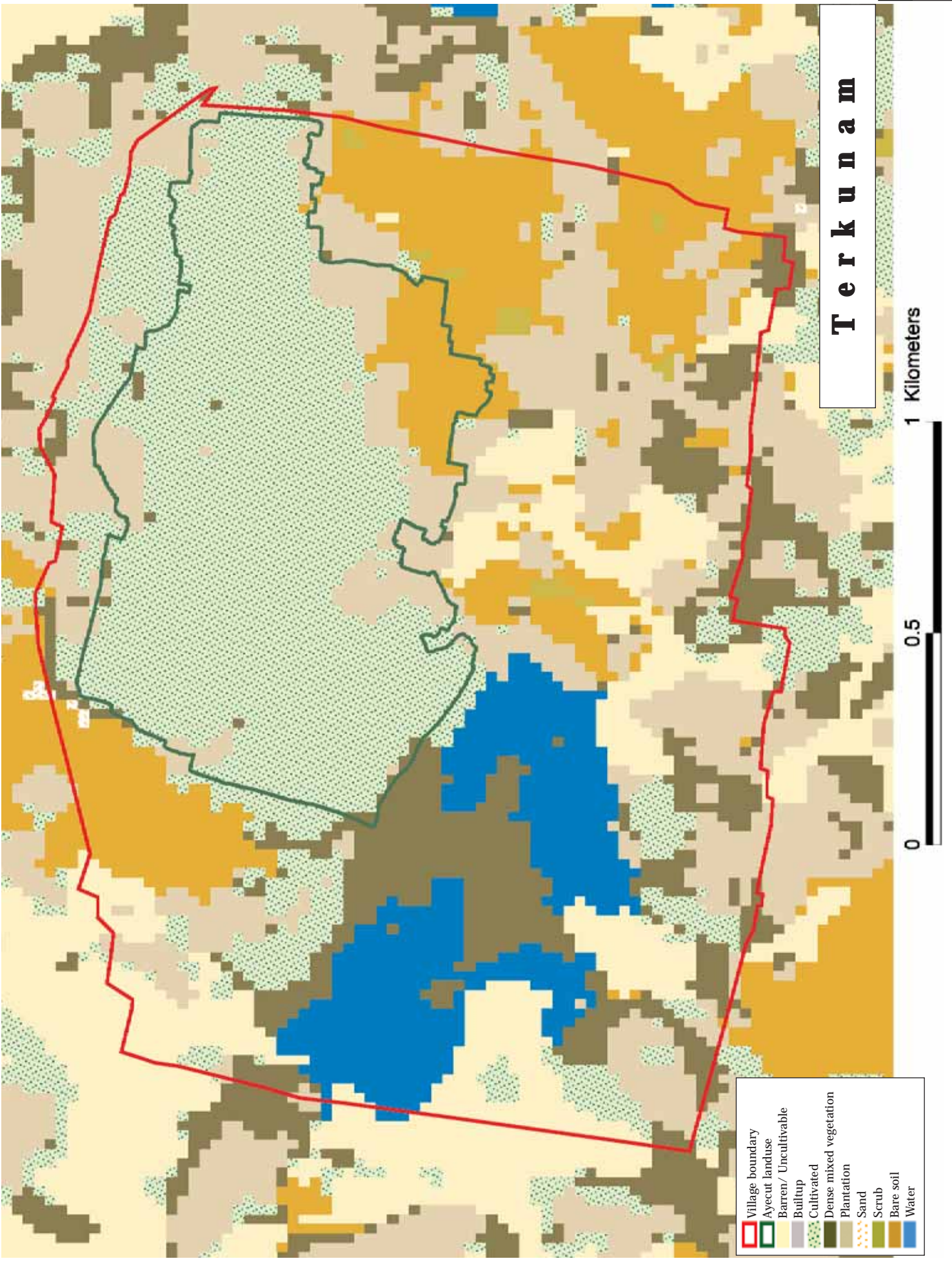
WPG

Women Puttadaar Groups

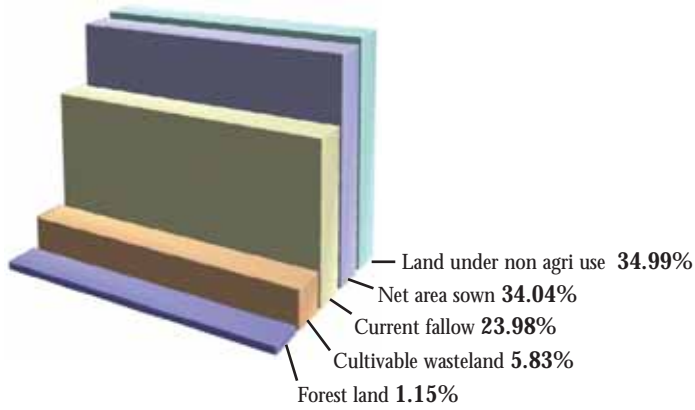
Institutional		
Number of Groups: 2		
Group name	Thenpennai	Nail nadhi
No of members	20	20
No of EC members	1	1
No of WP members	4	6
Date of formation	06/10/2003	06/10/2003

Financial		
Number of Groups: 2		
Group name	Thenpennai	Nail nadhi
Savings loan	16000	16000
Loan	8000	5000

Terkunam

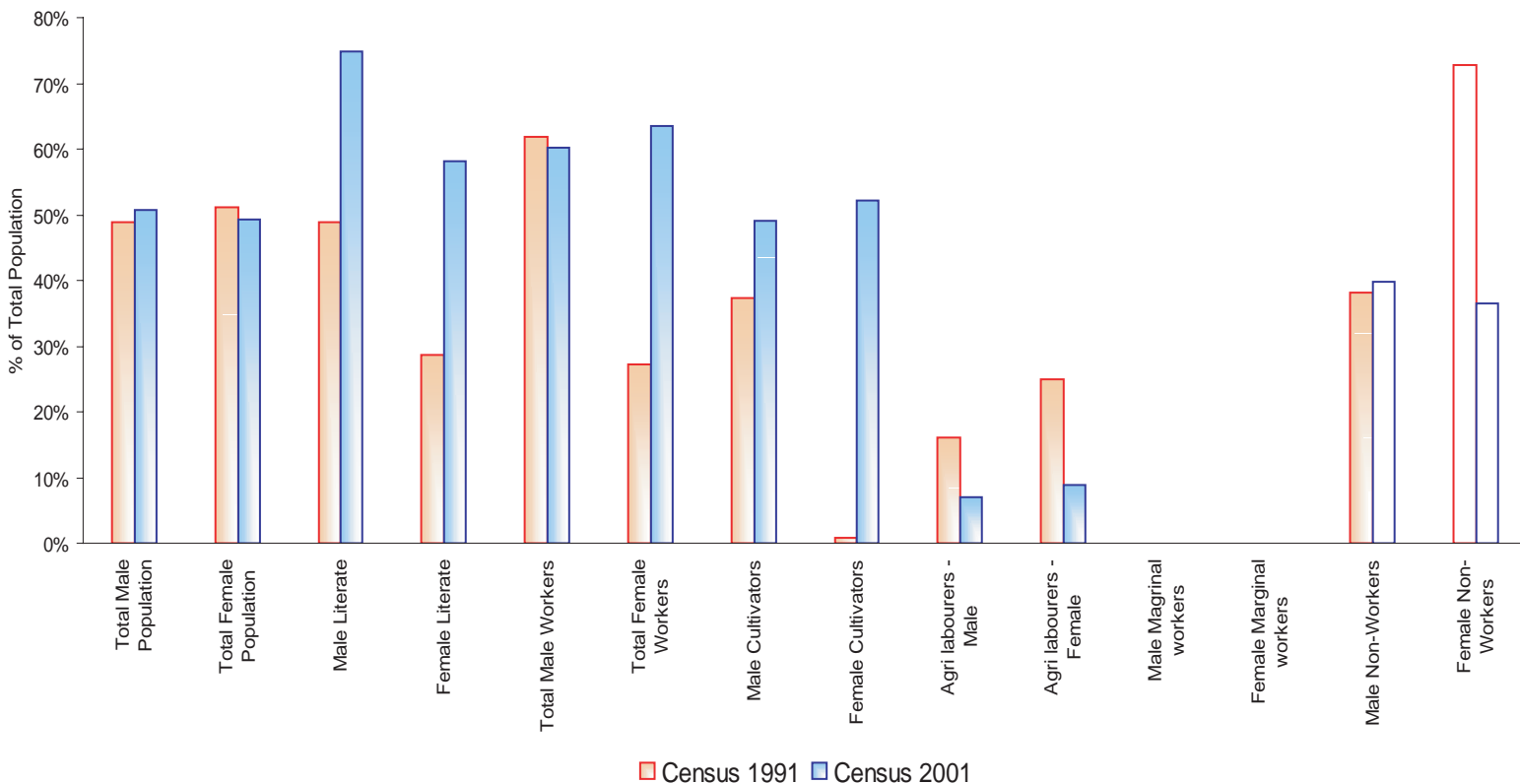


Agaram (Vada)



This small village situated at the neck of the Kalivelli wetlands and the estuary is unique in many ways. The main source of irrigation is a small spring which is recharged by water percolating through the sandy soils. Initially the lack of unity between different factions slowed down the pace of activities. The farmers rose above these challenges and ensured that substantial work was carried out. There has also been a high level of individual contribution from this small group of farmers. It was the first Association to experiment with the ferrocement option for lining their distribution channels. The women SHGs have also been active in motivating the farmers and have contributed to the activities. They have also taken up several income generation activities based on local resources. The present threat that this small command faces is the shrimp ponds that have become operational in the area.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	01/06/2000
No of members	45
Total No of EC members	13
No women EC members	4
Total size of command	22.43

Fund mobilization (in Rs)	
Individual Farmer's fund	27685.00
Village Common Fund	14857.00
30% contribution	42542.00
70% contribution	99264.67
Total funds raised	141806.67

30%

Physical work		
	2001-2002	2002-2003
Desilting	5250m ³	-
Bund strengthening	680m	-
Jungle clearance	2500m ²	-
Supply channel	-	-
Distribution channel	-	-
Sectioning in m	600m	100
Construction	-	Ferrocement channel
Increase in water capacity	0.19	-

Farmer Profile	
> 1 acre	84
1 - 2.5 acres	81
> 2.5 acres	23

WSHG

Womens' Self Help Groups

Institutional		
Number of Groups: 3		
Group name	No of members	Date of formation
Thalampoo	20	04/10/2000
Mampoo	12	09/10/2000
Shakti	15	20/10/2000

Financial (in Rs)	
Savings	120860.00
Loans	156050.00

Social activities	
Organised eye camp Kitchen garden and herbal medicine Plantation on tank bund	

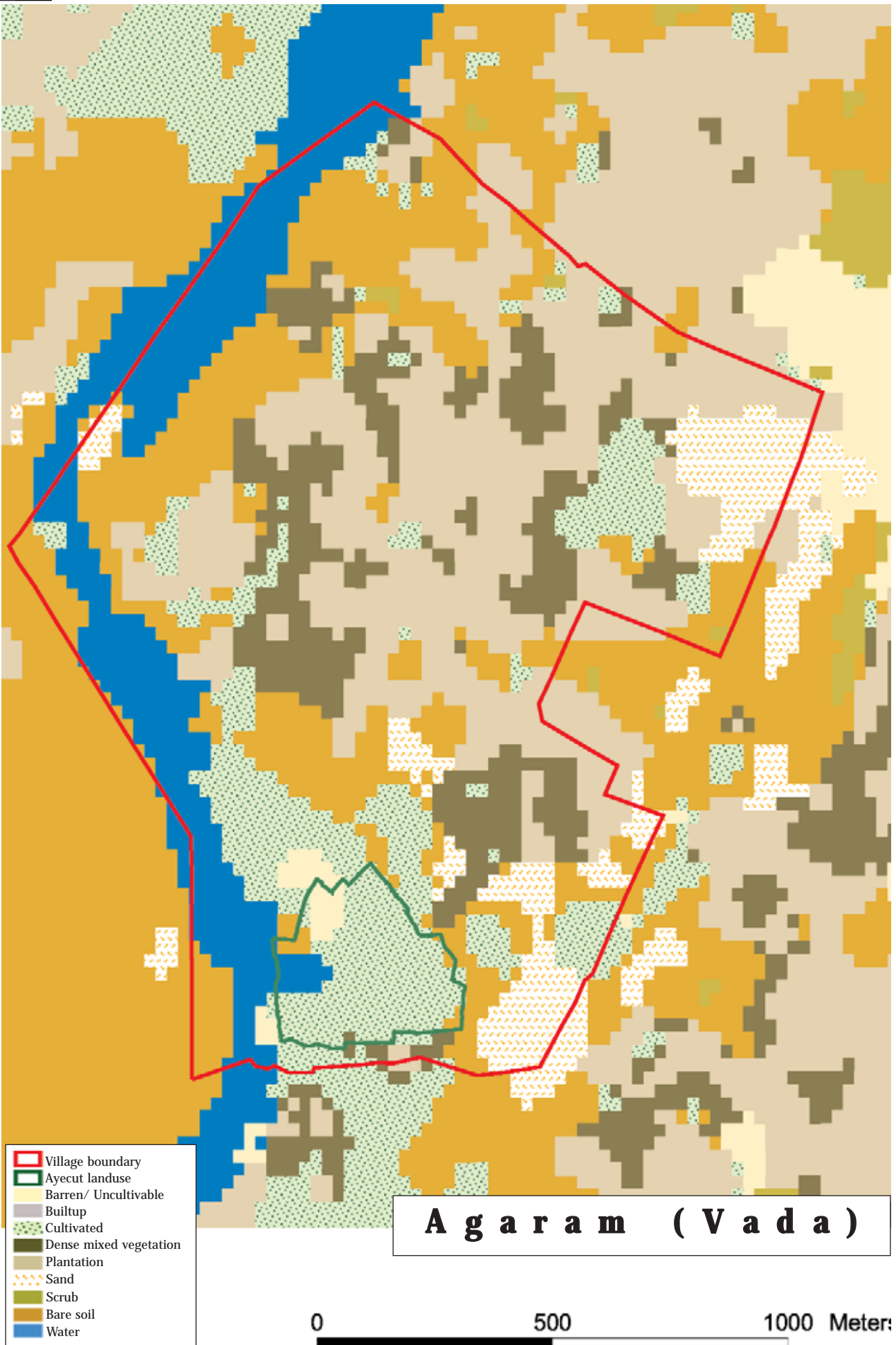
IGP		
	EA	RF
Jointly	Wood sales Keeth knitting Charcoal	Sewing machine Wood sales Keeth knitting
Individual	-	Agricultural inputs

WPG

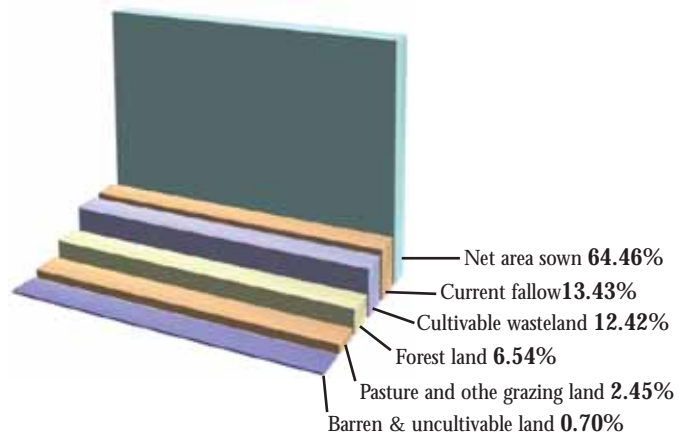
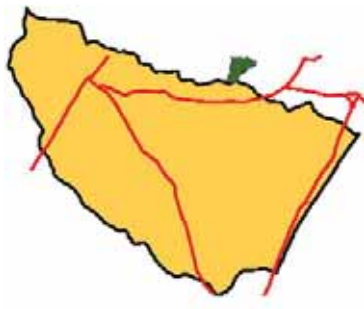
Women Puttadaar Groups

Institutional	
Group name	Mahanadhi
No of members	18
No of EC members	4
No of WP	3
Date of formation	22/11/2003

Financial (in Rs)	
Savings Loan	10300.00
Loans	8000.00

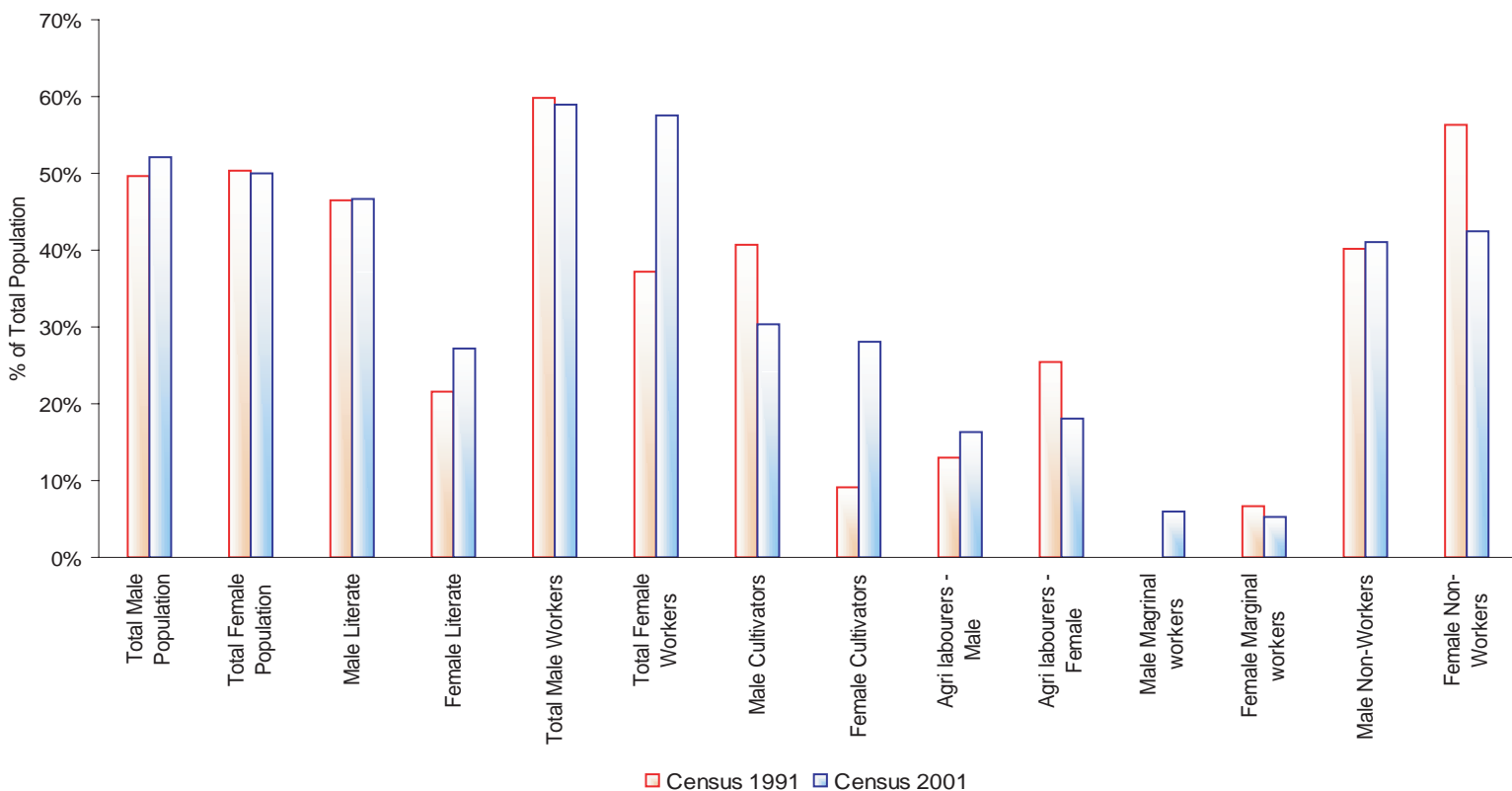


Nerkunam(Vada)



The non command farmers of this village were the first to show an interest in the project activities. They approached Palmyra to take a look at the tank and also helped in establishing contacts with the command area farmers. Most of the contribution (90%) was mobilised from the village common fund and was mobilised overcoming several problems. Several activities have been carried out on the tank including substantial amount of desilting.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	25/06/2001
No of members	104
Total No of EC members	15
No women EC members	2
Total size of command	180

Fund mobilization (in Rs)	
Individual Farmer's fund	14150.00
Village Common Fund	196684.00
30% contribution	210834.00
70% contribution	491946.00
Total funds raised	702780.00

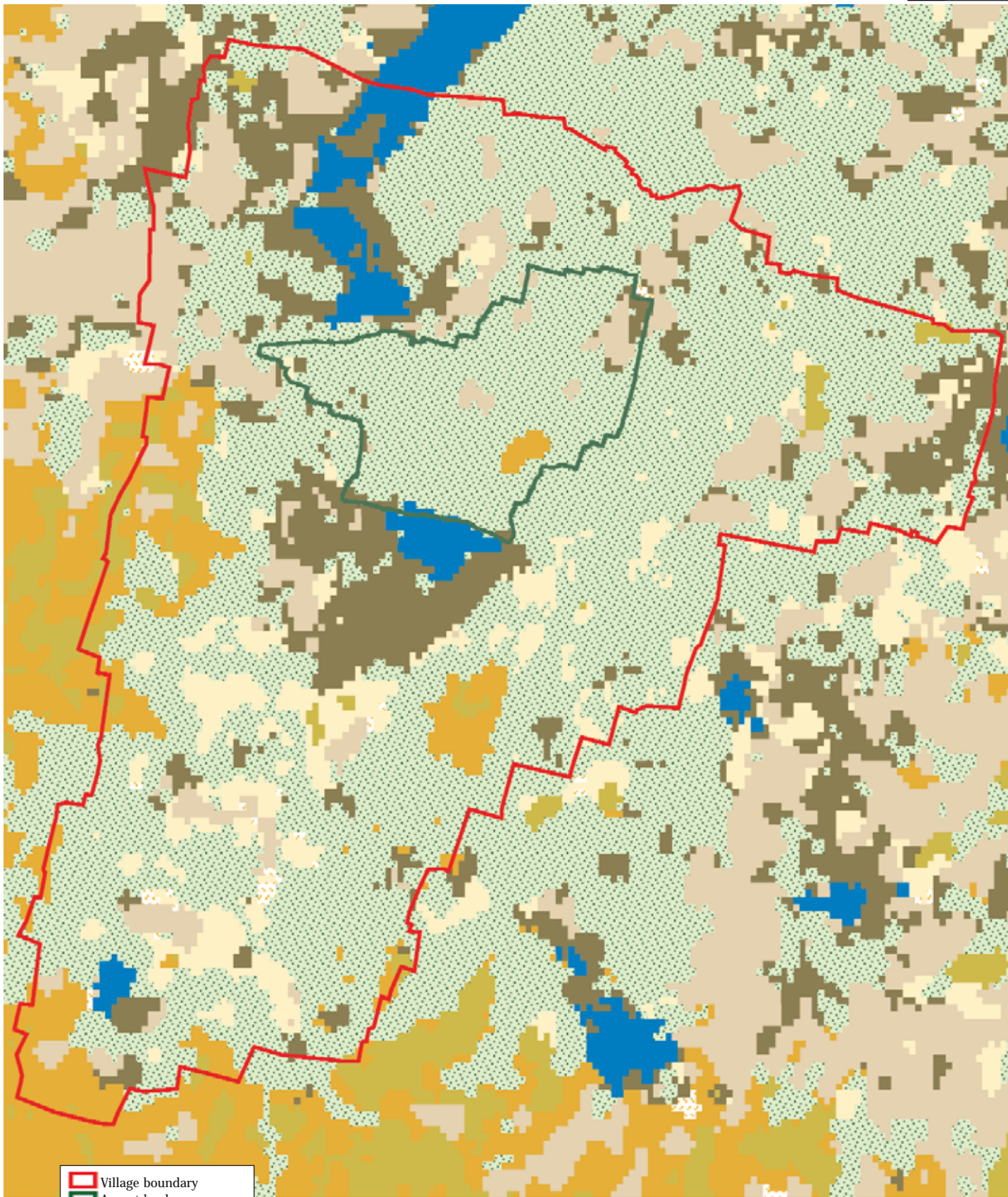
30%

Physical work	
	2003-2004
Desilting	10300m ³
Bund strengthening	-
Jungle clearance	-
Supply channel	-
Distribution channel	-
Sectioning in m	-
Construction	-
Increase in water capacity	0.3637342

Farmer Profile	
> 1 acre	29
1 - 2.5 acres	59
> 2.5 acres	16

WSHG

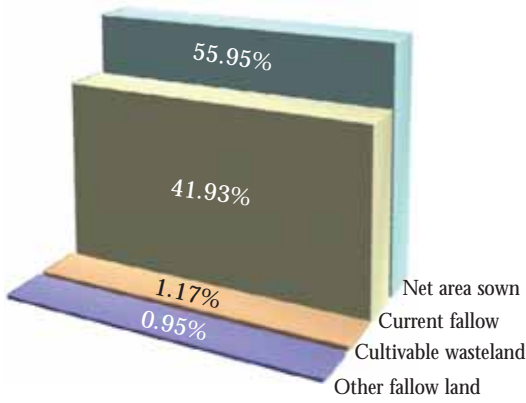
Womens' Self Help Groups



- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

0 900 1800 Meters

N e r k u n a m (V a d a)

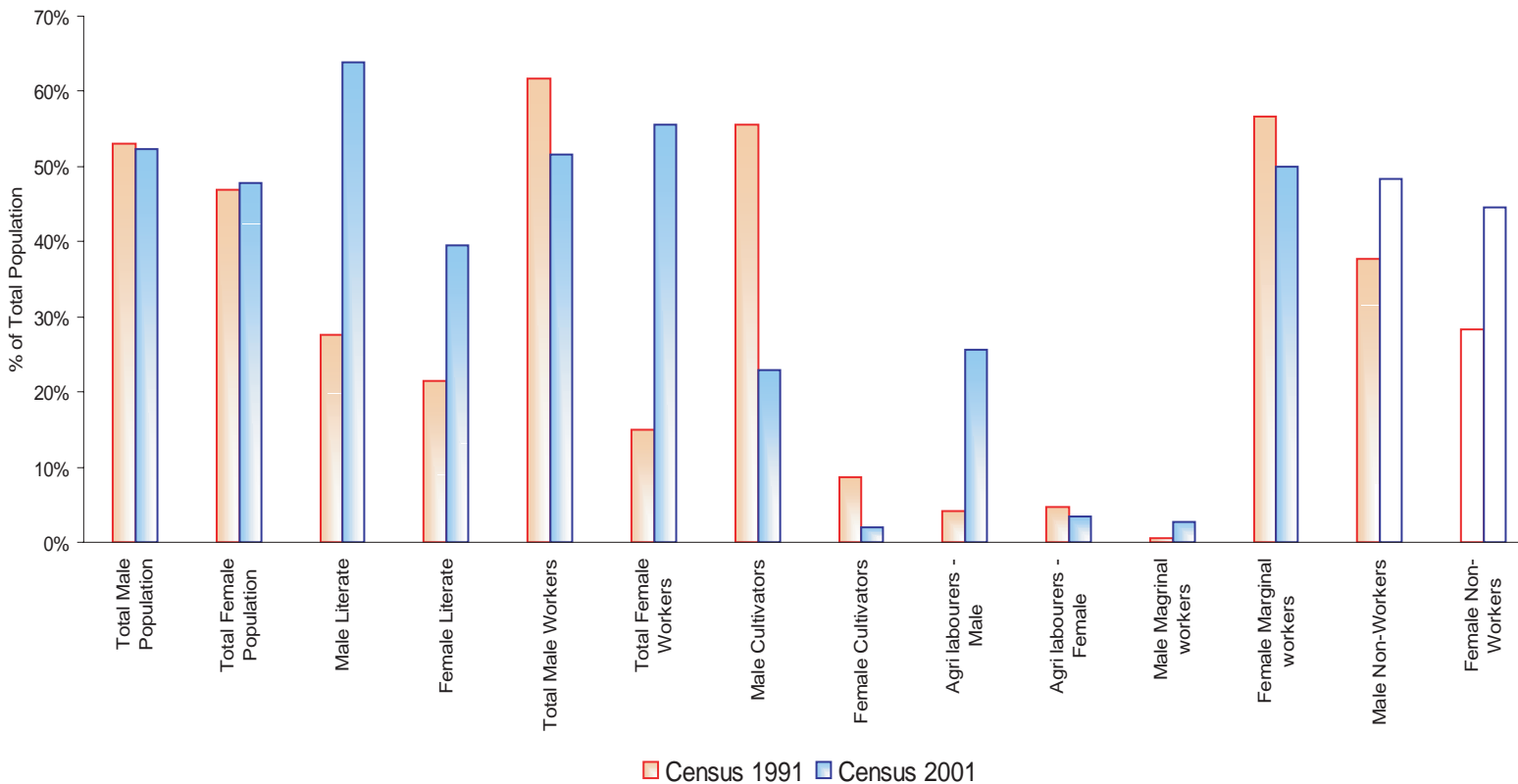


Vangaram



The women SHGs in this small, interior village spearheaded the efforts to rehabilitate their tank. Interest was generated on seeing work being done in the neighbouring villages. They also went on a door to door drive to collect contributions. Though all farmers except one own less than 2.5 acres, individual contributions have been about 50% of the total contributions. The SHGs are also involved in several income generating activities and have also started a grocery store in the village.

POPULATION DATA



WUA

Water Users' Association

Institutional	
Date of formation	11/07/2001
No of members	45
Total No of EC members	11
No women EC members	2
Total size of command	41.2

Fund mobilization (in Rs)	
Individual Farmer's fund	24740.00
Village Common Fund	33110.00
30% contribution	57850.00
70% contribution	134983.33
Total funds raised	192833.33

30%

Physical work	
	2003-2004
Desilting	4500m ³
Bund strengthening	950m
Jungle clearance	4200m ²
Supply channel	-
Distribution channel	-
Sectioning in m	950m
Construction	-
Increase in water capacity	0.16

Farmer Profile	
> 1 acre	25
1 - 2.5 acres	19
> 2.5 acres	1

WSHG

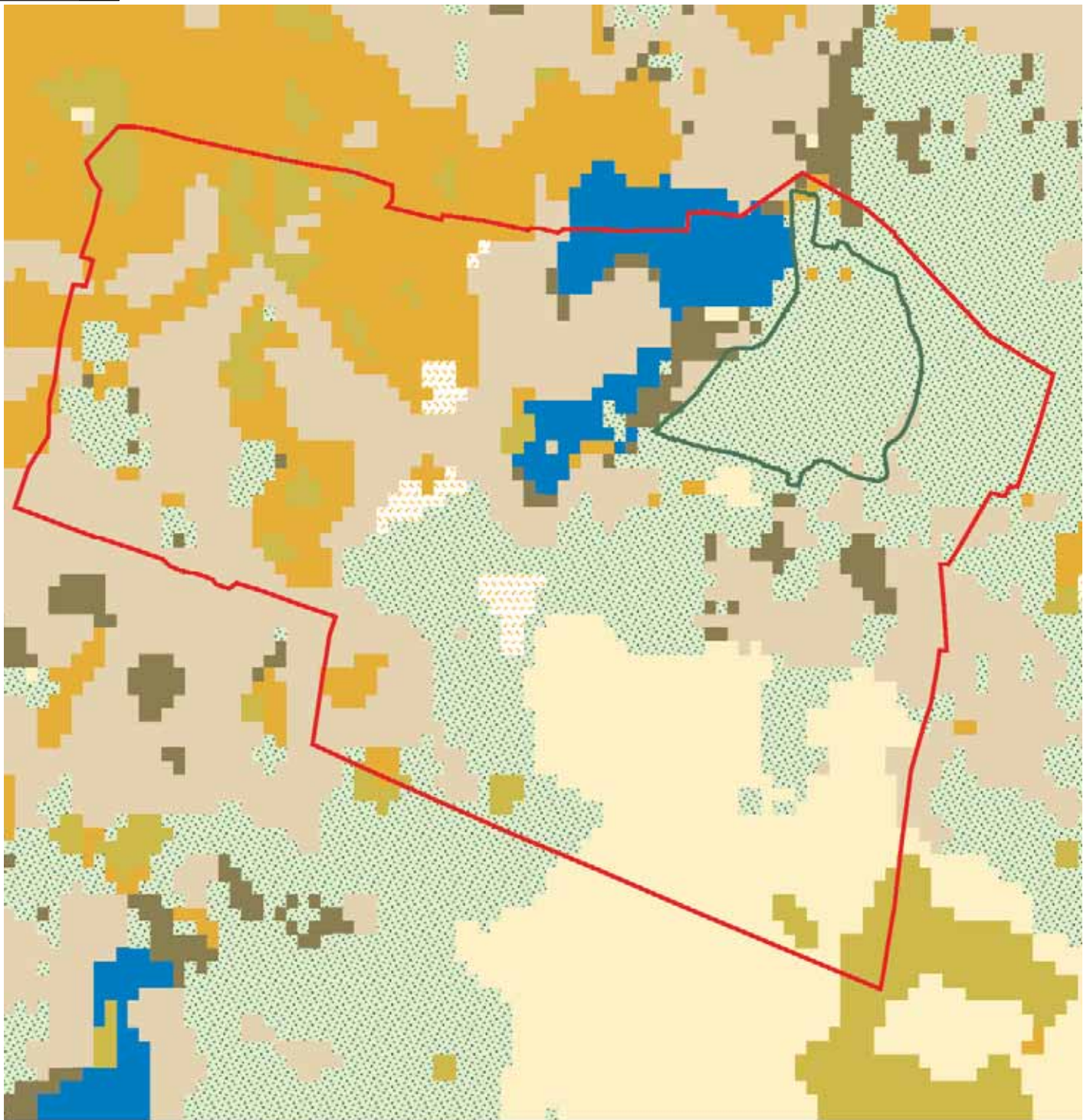
Womens' Self Help Groups

Institutional		
Number of Groups: 3		
Group name	Samanthi	Thalampoo
No of members	22	20
Date of formation	10/02/2000	19/07/2000

Financial (in Rs)	
Savings	68800.00
Loans	76370.00

Social activities
Organised eye camp Kitchen garden and herbal medicine Involved in plantation work Involved in contribution collection

IGP	
	RF
Jointly	Cattle Agricultural inputs
Individual	



0 0.4 0.8 Kilometers

- Village boundary
- Ayecut landuse
- Barren/ Uncultivable
- Builtup
- Cultivated
- Dense mixed vegetation
- Plantation
- Sand
- Scrub
- Bare soil
- Water

V a n g a r a m