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Panchayat Resource Mapping to Panchayat-level Planning in Kerala: An Analytical Study

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1. Introduction

Background

Considerable emphasis has gone into decentralisation and micro-level planning with people's initiative and participation in the process of development since introduction of the Eighth Five-Year Plan. The 72nd and the 73rd Constitutional amendment bills of 1991 provided Constitutional safeguards towards the establishment of Panchayati Raj Institutions at the district, block, and panchayat levels.

The panchayats are supposed to be empowered with respect to:

(i) Preparation of plans for economic development and social justice; and

(ii) Implementation of schemes for economic development and social justice as may be entrusted to them including those in relation to matters listed in the 11th Schedule of the Constitution.

These tasks of Plan preparation and execution require detailed technical, socio-organisational, and institutional inputs at various levels. Information related to resource availability, resource use, and information gaps, and constraints and potentials has to be generated/gathered for preparing viable Plans.

It is noteworthy that an initiative in this direction was taken up in 1990 in Kerala. In that year, a programme entitled 'Panchayat Level Participatory Resource Mapping', commonly known as PRM programme was introduced by Centre for Earth Science Studies (CESS) in collaboration with Kerala State Land Use Board (KSLUB) and Kerala Sastra Sahitya Parishad (KSSP). A pilot project was financially supported by the Department of Science and Technology, Government of India to cover 25 panchayats distributed across the State to firm up the methodology.

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The programme, intended to cover a very broad spectrum both in terms of technical and sociological aspects was expected to provide a new dimension in micro-level planning.

Considering the potential of this programme, particularly in view of the renewed emphasis on decentralised planning and strengthening of panchayat institutions given through appropriate Constitutional amendments, the Government of Kerala accorded it official recognition and issued necessary orders during 1990 (and 1992) for it to cover all the Grama Panchayats of the State in a span of five years from 1991 (Government of Kerala, 1990, 1992). The responsibility of mobilising volunteers was initially entrusted with the KSSP, a people's science organisation in Kerala; however, the Government which came to power in 1992 envisaged that it would be primarily the task of a panchayat to mobilise the volunteers with assistance bestowed by the voluntary organisations.

The programme has generated tremendous interest both within and outside the State though, the entire State could not be covered in the stipulated time period. Other State Governments and Non-Governmental Organisations (NGOs) are using the methodology evolved to execute this work with marginal alterations.

The Department of Rural Areas and Employment, Government of India, has recommended PRM as one of the methodologies to conduct resource inventory for watershed and wasteland development. By 1996, with the launching of the People's Planning Campaign, panchayats have been rejuvenated and are expected to take up increasing responsibility in project planning and execution. In view of these developments it is necessary (i) to assess the extent to, and the manner in which panchayats use PRM data to formulate their Plans and (ii) to devise ways to make PRM an effective and essential tool for micro-level planning. The present study constitutes an endeavour to address these questions.

Objectives

The following are the major objectives of this exercise:

(i) assessment of the technical and organisational aspects of PRM in some selected panchayats;

(ii) comparison of the action plans of a panchayat covered by PRM with those of another not covered by PRM;

(iii) study of how PRM is being translated into Panchayat Level Planning (PLP) in this panchayat;

(iv) understanding the modalities of programme implementation (action planning) at the panchayat level;

(v) analysis of the scope of integrating PRM with other activities of the panchayat; and

(vi) making suggestions to develop a replicable methodology of translating PRM to PLP.

Issues

The following issues are discussed at the macro and the micro levels for achieving the objectives.

Macro issues

(i) process of decentralisation and micro level planning as being generally practised in the country;

(ii) role of panchayats in planning;

(iii) scope and content of panchayat planning; and

(iv) forward and backward linkages of panchayat Plans.

Micro issues

(i) state of resource endowments of the panchayat under study;

(ii) implementation of PRM;

(iii) use of PRM data for Plan preparation;

(iv) problem of conducting PRM;

(v) local resource use by the panchayats; and

(vi) spatial planning at the panchayat level;

Methodology

A qualitative survey constitutes the foundation of the methodology for this study. Information was generated through interviews and questionnaire survey at the panchayat, district, and State levels.

A structured questionnaire was prepared to set broad guidelines for information generation. Detailed discussion with the elected members and the local public in the panchayat provided the supplementary material for the analysis.

As part of the survey of the relevant literature on the process of panchayat planning in the country as a whole, we have made an intensive review of West Bengal, perhaps, the only State, where panchayats have been active since 1978.

Development Reports prepared by the panchayats in Kerala as part of People's Plan Campaign were examined in detail to assess the PRM-PLP linkage. Discussions with the members of voluntary organisations and science and technology institutions were held for obtaining their views on PRM and data utilisation.

Various statistical techniques were used to carry out spatial planning of a panchayat. Functional hierarchy of road junctions, and accessibility, and distribution of services were worked out. A time-line for PRM execution in the State was also worked out based mainly on information available at CESS. The particular methodology followed for each item of the PRM exercise is dealt with in detail in the respective sections.

Considering the large number of issues to be discussed and the broad spectrum within which these issues operate, we present the report in the following order.

A brief discussion of the participatory research programme is provided in the following part of this introductory section. The second section gives an overview of the Participatory Panchayat Resource Mapping (PRM) programme in Kerala. It begins with the genesis of the programme, its various aspects of execution and the problems encountered in execution of the programme. The resource mapping done in a sample panchayat is also reported in this section.

The third section introduces the genesis of panchayat-level planning in India and the launching of the campaign for people's participatory planning in Kerala. The scope, uses, and limitations of resource maps for planning is the subject of discussion in the fourth section. Data analysis for spatial plan of a panchayat has been attempted in section 5.

Section 6 deals with the need for steady application of science and technology inputs into and the institutionalisation of this process for its further development and refinement and replication for wider use. The major conclusions of the study are summarised in section 7.

Participatory Research Programme: A brief account

Participatory research (PR), by definition, indicates a system of research in which both the potential users of research results and the researchers themselves are involved. It is essentially a part of applied research in a broader sense, in which research is not limited to solving problems alone; rather, it may, sometimes, contribute to the recognition and understanding of the situations and relations in which the participants are entangled (Lammerink & Wolffers, 1994).

Rural development is one of the sectors where PR has found wide use in recent years. The seventies witnessed major shifts in planning strategies. Changes from a top-down to a bottom-up approach were emphasised. The growth impulses did not tickle down as expected though rural development had been initiated in many countries as early as the 1950s. The lessons learnt from this approach coupled with the subsequent growth centre experiment which again proved inadequate, triggered attitudinal changes among the planners. The centralised standard blue print of Plans has gradually given way to the decentralised mode of planning and to utilisation of local wisdom in Plan preparation. In a three-part article, Chambers (1994) has dealt with Participatory Rural Appraisal (PRA) in great detail. Partici-

patory research in the context of rural development started taking shape with the introduction of Rapid Rural Appraisal (RRA) in the late 1970s.

While the bottom-up approach was taking root during this time, there arose a need for understanding the ground level reality not through conjectural data but by collecting factual information. The questionnaire survey widely in use for collection of field level data appears to have its advantage in data; however, the data so collected are found to be accurate in many cases. It is such limitations that had contributed to the evolution of participatory research in general and RRA in particular.

Chambers (1994a) pointed out that many individuals and institutions had collaborated in developing the methods and principles of Rapid Rural Appraisal. By the late 1980s, the term participation entered into RRA. Over the years, it is getting increasingly realised that people's participation is one of the most important desiderata in the process of development. This is evident from the fact that by now activities labelled as PRA have come to use in various forms in at least 40 countries spread out across the continents. The following five streams of activities may be identified as parallels to PRA (Chambers, 1994):

(i) activist participatory research;
(ii) agrosystem analysis;
(iii) applied anthropology;
(iv) field research on farming system; and
(v) rapid rural appraisal.

The Agenda 21 (UNCED, 1992) recognised the importance of participation in achieving sustainable development. It emphasised the imperative for effective participation of all concerned citizens, indigenous people and their communities, other local committees, and women in environmental protection and development. Participatory Rural Appraisal (PRA) occupies the central place in participatory research, and its methodology is in use in various sectors. This is possible due to the inherent flexibility of the methodology; and it is primarily a family of tools rather than a single method. Table 1.1 provides a list of PRA methods, which is not exhaustive, but does cover a broad spectrum.

Table 1.1 Participatory Resource Appraisal tools

Informal discussion	Venn diagram
Semi-structured interview	Social mapping
Group discussion	Resource mapping
Time-line preparation	Cognative mapping
Transect walking	Modelling
Seasonal calendar preparation	Matrix, storing, and ranking
Activity scheduling and daily routine	Sequencing
Secondary source data collection	Livelihood analysis
Data analysis through group activity	Well-being,wealth grouping, and ranking
Problem tree preparation	Prioritisation
Plan preparation	Presentation
Report preparation	

The Participatory Resource Mapping (PRM), evolved in Kerala, though it belongs to participatory research, is somewhat different from the regular PRA exercises. This will be evident in the next section, which deals with PRM in the State. Table 1.2 provides a comparative picture of the different approaches being used in the planning process.

Table 1.2 Three approaches of planning process

Item	Conventional approach	Usual Participatory appraoch	The PRM (Kerala) approach
Idea	Department to people	Organisation/ Department to people	Organisation to people and vice versa
Awareness campaign	Routine	Routine-Field Officer / local leader	Part of the programme
Survey	Department/ Organisation	Organisation & people	Trained people & experts
Project formulation	Department	Organisation	Local people & experts
Project design	Department	Department	Trained resource persons & experts
Execution	Contractor	Contractor/ local body contributes	People's Orgn. & Panchayats
Maintenance	No follow up	Left to local people without skill	Local people with acquired skill
Benefit	Contractor (money)	Local leader/ Organisation (Name & Fame)	People
Goal	Fulfilling target	Fulfilling target	Empowerment
End results	Dependence on Government	Dependence on Organisation	Self reliance

2. Panchayat Resource Mapping (PRM) in Kerala: An overview

PRM is perhaps the culmination of a long process of close interaction among social activist groups, people's science movement (PSM), and science and technology personnel. As indicated in the previous section, there was a growing realisation all over the world about the inadequacy of the conventional methods of data generation and planning. While PSM and activist groups are intent on making in-depth intervention in the development process, the science and technology personnel are in search of a proper avenue to provide the necessary

inputs for development.

Map as a medium of communication is a felt need even at the grassroots-level. It is noteworthy that in 1989, A.P. Chandran, a local primary school teacher in Vazhayoor panchayat, Malappuram district, together with his associates, prepared a sketch map showing the water resource of the village.

Centre for Earth Science Studies (CESS) brought out a Resource Atlas of Kerala way back in 1984. The maps were in 1:1,000,000 and 1:2,000,000 scale with districts and taluks as the lowest units. In 1989, with support from the State Planning Board, a series of maps for district planning of Kasargod were brought out in a scale of 1:250,000.

In early 1990, thanks to the initiatives of Sri. Subrata Sinha, the then Director of CESS, a micro-level resource survey in 1:12,500 scale for the Ulloor panchayat was completed with collateral plotting in 1:3960 scale cadastral map (CESS, 1991). Cadastral mapping was necessary to involve local volunteers in the efforts. It is easier for the local people to plot in cadastral map than in any other base map. It aroused considerable interest among all sections of the local society and for the first time in the State, a set of basic resource maps was made available at the panchayat level on a large-scale. This exercise was popularly known as 'Ulloor Model' and formed the base for widespread consultation within and outside the State.

The Department of Rural Development, Government of India recommended this approach to all the States for use in programmes undertaken for watershed management and wasteland development (CESS, 1991). The Director of CESS held discussions with the Vice-Chairman, State Planning Board and functionaries of KSSP. It was agreed upon that KSSP will mobilise volunteers at the panchayat level for resource mapping and CESS will provide technical support and train the volunteers. By this time, the literacy movement involving large numbers of volunteers was gaining momentum and turning into a major people's science movement in Kerala.

It was felt that the army of volunteers mobilised for the literacy campaign could possibly be drawn into the campaign for local level development by initiating a PRM programme covering the entire State. The 28th annual conference of KSSP held at the Cochin University of Science and Technology in February, 1991 gave a call to social activists and activist organisations for the participation in development process of the State.

The situation in the State was quite ripe for taking such a major step. A micro-level participatory resource mapping module was available at that time and the volunteers were willing to take the next step.

To begin the process of Statewide PRM, a project entitled 'Panchayat-level resource mapping for decentralised planning with people's participation' was submitted to the Department

of Science and Technology (DST), Government of India, New Delhi, jointly by CESS and KSSP. A DST team visited CESS and witnessed a field demonstration of Participatory Resource Mapping by volunteers in Attipara panchayat. The project was formally sanctioned on 27 March 1991.

Meanwhile, Government of Kerala issued an order (No. M/S 78/90/plg dt. 15.12.1990) in December, 1990 to conduct PRM covering all the panchayats in the State within a period of two years. CESS was identified as the nodal agency and KSSP was entrusted with the job of mobilising volunteers.

By this time Kerala State Land Use Board also became a partner to execute this programme. Subsequently the government extended the time limit for completion of the work to five years and the responsibility to mobilise volunteers was given to panchayats, with voluntary organisations as collaborative agencies.

In March 1991, a week-long State-level camp was held at Integrated Rural Technology Centre (IRTC), Mundur, Palakkad district for training master trainers. The scientists from CESS and specialists from Kerala State Land Use Board trained about 100 volunteers mobilised from all over the State. A handbook in Malayalam was prepared detailing background of the programme, mapping procedures, and mapping symbols.

With completion of this training programme, the stage was set for initiating the State-wide programme.

Conceptual frame

Before dealing with the details of the programme, a brief discussion of its conceptual frame may be in order.

Decentralisation of planning process is an accepted policy of the Government. However, it meant only decentralisation of political power up to the panchayat level till the 1980s. It was only with the 73rd Constitutional amendment that delegation of the power of planning and execution to the panchayats was made obligatory.

The theoretical basis to initiate this programme may be summarised as following:

(i) Development, to be sustainable, has to rely upon environmental resources or renewable natural resources like land, water, and biomass;

(ii) Resource use and intervention for development calls for micro-level details of localities in which actual operation is attempted;

(iii) Spatial integration of environmental opportunities and socio-economic realities should begin from the micro-level;

(iv) A micro-level data base is necessary to assess ground realities. These data may be synthesized at different levels, in the process a hierarchic data structure essential for different levels of planning could be built up;

(v) People would effectively participate in the planning process only when they are involved in diagnosis, analysis, planning, and Plan implementation;

(vi) Traditional wisdom lying dormant at the different levels of society needs to resuscitated, updated, and improvised through blending of modern scientific and technological inputs. Active participation of local people will facilitate this process;

(vii) Empowerment of people is possible by providing them with factual information and drawing them into the process of information generation, management, and utilisation;

(viii) Participation of local people in the planning process will strengthen the process of democratisation of the society.

Implementation of the programme

The Approach paper (CESS, 1991) dealt elaborately about the modalities to implement this programme. A brief account of the broad framework under which PRM activities were initiated is presented here. During the early stages, CESS and KSSP jointly identified the panchayats to be taken up for mapping.

Subsequently, it was the panchayats themselves that expressed their desire to be covered by PRM work and informed CESS accordingly. Apart from KSSP, Centre of Science and Technology for Rural Development (COSTFORD), Desiya Sasthra Vedi (DSV), and People's Community Organisation (PCO) also participated.

The first phase of the programme was environment building and selection of volunteers once a panchayat was selected for PRM work. A checklist was supplied to the panchayat for undertaking a series of activities.

When the selected panchayat was ready with volunteers (minimum five for each ward) technical personnel from CESS visited the panchayat and initiated a training programme in mapping for the volunteers. The activities consisted of training for mapping and socio-economic survey, initiating mapping, and guiding the volunteers for re-plotting. The re-plotted maps were sent to CESS for final drafting.

Simultaneously qualified earth scientists conducted a land and water resource survey in 1:12,500 scale and internalised the data generated through voluntary mapping in 1:3960/ 1:7920 scale. In some panchayats, volunteers took up work by the earth scientists prior to survey; in some others it followed voluntary mapping.

All the maps were handed over and their details were explained to the panchayat. Thus, the process of Plan preparation was initiated.

Methodology

The methodology adopted for initiating PRM was given in an approach paper by CESS (CESS, 1991). However, some modifications were made during the course of project implementation. The methodology is broadly the following.

During initiation of PRM, there was the following four-fold task to cover all activities pertaining to data collection and mapping,

Task 1: Landuse and asset mapping: This task was done by volunteers after they received due training in the 1:3960/1:7920 scale cadastral map and collection of details about all water structures (well/pond/tube well/borewell) in a structured format by volunteers.

Task II: Preparation of relief, landform, surface material and water availability map: This task was taken up by the earth scientists in 1:12,500 scale through field survey and collection of data at 250m interval (16 samples per sq. km.).

Task III: Preparation of environmental appraisal map through collation of both sets of data. The volunteers undertook this task.

Task IV: Collection of socio-economic data from households. This was a task done by volunteers.

The following changes were made during the course of implementation:

(i) Preparation of relief, landform, surface material, water availability, and environmental appraisal map was discontinued. Only geomorphology and drainage maps were prepared from the toposheets (1:50,000).

(ii) Collection of socio-economic data was also discontinued.

(iii) Attempts made to collect selected land-related data through the volunteers in Thrissur district were not successful.

During the time of closing of the PRM project at CESS, an attempt was made to conduct post-mapping exercise for some selected panchayats and also to make use of PRM data for watershed management, coastal zone management, and similar applied purposes.

Resource mapping of a sample panchayat

In this section, an attempt is made to discuss resource mapping in a panchayat. Mezhuveli

in Pathanamthitta district is the panchayat chosen for the discussion. CESS has sent reports on these lines to the panchayats in which the first phase of PRM work was completed.

Resource mapping in Mezhuveli panchayat was taken up in the first phase of the programme during 1990-'91. This formed part of the work taken up in 25 panchayats, supported by DST, Government of India.

Resource mapping began with the imparting of training to 50 volunteers selected by the panchayat and KSSP. Project scientists recruited for the purpose of resource mapping supervised the work. Some basic data relating to Mezhuveli panchayat are given in Table 2.1.

Table 2.1 Mezhuveli panchayat: Some basic data

Panchayat	Mezhuveli
Natural Region	Midland
Area	14.44 sq. km
No. of Wards (1991)	8
Population (1991)	14,121 persons
Density of population	978 person/sq. km.
Literacy (excluding children < 6 yrs)	86.01 per cent
Total road length	91.18 km

The Resource maps prepared for the panchayat (together with scale) and type of personnel involved in the work are given in Table 2.2.

Table 2.2 Resource maps, scale, and participants

Map	**Scale**	**Personnel**
Landuse	1:3960	Volunteers
Asset	1:3960	Volunteers
Relief	1:12,500	Earth Scientist
Landform	1:12,500	Earth Scientist
Surface material	1:12,500	Earth Scientist
Water availability	1:12,500	Earth Scientist
Environmental appraisal	1:12,500/ 1:3960	Earth Scientist

A brief description of each map is provided here. Information available from these maps and utility of the maps is given in Table 2.3.

Table 2.3 Resource maps: Themes, information, and utility

Theme	Information Available	Utility
Landform	Geomorphic units Slope categories & direction Erosion prone areas	Land capability assessment Action plan for soil conservation, Landuse planning Carrying capacity assessment
Basement configuration	Lithology Depth to bed rock Geologic structure	Assessing thickness of weathered/unconsolidated material, Assessing water holdingpotential Erosion/Land slide management.
Water availability	Perennial & seasonal areas, Depth to water table fluctuation well/pond density water quality Location of springs Potential	Water resource development & management Identification of potential sources. Development of ponds & springs, Guideline for optimum well depth & location Developing a model for conjunctive use of water resources.
Surface material	Soil type, Soil texture, Soil thickness/ depth, Soil drainage Geologic structure	Assessment of productivity & stability of soil Geohydrologic investigation Availability of minor minerals (Sand, clay, rock etc.)
Environment-tal Appraisal	Erosion prone areas Water logged areas Dry areas Waste lands Flood prone areas Salinity infested areas Degraded land Deforestation Landslide prone area Reclaimed areas	Environmental hazard management Landuse planning in conformity to natural setting Base to initiate discussion at local level for action planning.

Theme	Information available	Utility
Landuse	Existing landuse-plot-wise details Including paddy, agriculture Sites of paddy field reclamation Distribution of waste land, marshes, water bodies	To assess existing landuse pattern To compute area under diff-erent landuse categories/crops To formulate sustainable landuse pattern To plan for landuse consolidation
Asset	Administrative division Road/Railways/ canals etc Distribution of school, college, hospital, market, P&T facilities etc Wells, ponds, water structures	To assess spatial distri-bution of infrastructural facility To plan for social & physical infrastructural To help preparing estimates for construction/engineering purposes To delineate under developed areas.

Relief

This panchayat is located at the interfluve of the Pamba and the Achankovil rivers. The general slope is towards the north. Most of the streams flow in that direction and join the Pamba river.

The relief (Fig 2.1) is, in general moderate varying from 10 m to 140 m above mean sea level. Malanthevarkunnu (132 m) located at the western part of the panchayat is the highest point. The other areas having considerable elevation, above 80 m, are Chandanakunnu, Kanjirakkunnu, and Ulanurodikkunnu. The southern and southwestern portions of the panchayat and the valley floors are characterised by low relief.

Landform

Landform may be broadly classified into three groups:

(i) Laterite crests/mounds,
(ii) Laterite slopes, and
(iii) Valleys.

Eight landform units identified in the panchayat are presented in Figure 2.2.

A brief description of these units is provided here for a general understanding of the land resource base. Landform units and their areal coverage are provided in Table 2.4.

Table 2.4 Landform units and their areal extent

Sl. No.	Surface	Landform unit	Mapping unit	Area (sq.km)	In per cent
1.	Top	Elongated ridge crest (<5°)	T1	0.53	8.1
		Hill Crest (<5°)	T2	0.64	
2.	Sloping	Steep side slope (..18°)	S4	0.52	57.5
		Moderately steep side Slope (10°-18°)	S3	1.14	
		Moderately side Slope (5°-10°)	S2	4.91	
		Gentle side slope <5°	S1	0.79	
		Foot slope (<5°)	FS	0.67	
3.	Bottom	Valley	V1	4.97	34.4
		Total		14.44	100%

(i) Lateritic crest: The crest is the topmost part of a topographic sequence, and is composed of ridge crest (T1) and hill crest (T2). The area covered by this unit is 1.17 sq.km or eight per cent of the total area. Slope is less than 5°. Ridge crests are elongated and broad while hill crests are isolated and limited in extent.

(ii) Laterite slopes: The crests are encircled by slopes that gradually merge into the valleys. This intermediate topographic unit may be further divided into five mapping units on the basis of degree of inclination and position viz steep side slope (S4), moderately steep side slope (S3), moderate side slope (S2), gentle side slopes (S1) and foot slopes (FS). The slope angle ranges from 5° to 18°. The steep slopes are prone to erosion. Since the lateritic slopes are retreating in nature, flat bottom valleys are enriched with loose material.

Due to hard crust formation, pediplanation (parallel slope retreat) dominates the process of landscape evolution in the lateritic terrain. The total area covered by the sloping surface is about 57 per cent of the panchayat area.

(iii) Alluvial lowlands: This unit covers about 4.97 sq.km or 34 per cent of the total area. The surface material is alluvium. The majority of the valleys in the panchayat are formed by the tributaries of Pamba draining the northern part and the Achankovil river that drains southern part. The largest valley in the area is formed by the Kozhithodu river, a tributary of Pamba that occupies the central part of the panchayat covering about 2.49 sq. km.

Surface material

Surface materials of the panchayat may be classified into three groups (Fig. 2.3). Riverine alluvium, mostly found in valleys and stream banks, covers a little over one-third of the total panchayat area. Based on texture and other characteristics, riverine alluvium found in the

Panchayat area are of two types (Table 2.5). Laterite soils are found along the sideslopes panchayat area. Based on texture and other characteristics, riverine alluvium found in the panchayat are of two types (Table 2.5). Laterite soils are found along the sideslopes and duricrust and rock exposures characterise the ridge crest and the hill crests. Variations of surface materials are associated with geomorphic variation and have definite impact on the production potential of the land.

Table 2.5 Surface material and their characteristics

Surface material	Texture	Soil drainage	Depth	Colour	Erosion
Alluvium	Sandy clay loam	Poor	Deep	Dark brown to black	Very low
Alluvium	Loamy sand	Well drained	Deep	White to Yellow brown	Low
Laterite	Gravelly clay loam	Moderate	Shallow to deep	Reddish brown	Moderate
Laterite duricrust	-	-	-	Reddish brown	Moderate
Rock outcrop	-	-	-	-	-

Water availability

Availability of water is discussed under two categories: surface water and subsurface water. Data on water availability were mostly collected by the volunteers.

Surface water

Ponds, streams, canals, and springs constitute the surface water source (Table 2.6). There are 47 ponds out of which 27 are perennially utilised mainly for irrigation purposes. Many ponds are found to be eutrophicated and therefore abandoned.

Table 2.6 Existing surface water sources

Sl. No.	Source	Length/Nos (km)	Remarks
1.	Ponds	47 Nos.	About 795 persons depend on these ponds mainly for irrigation purpose. 27 ponds are perennial
2.	Streams	15.10 km	Drains into Pamba river and Achan-kovil river
3.	Spring	21 Nos.	Around 1000 persons depend on these springs
4.	Canal (Pamba irrigation canal)	3.20 km	Leakage from canal causes water logging especially in ward III/ watersheds P4 and P5

Of the 47 ponds in the panchayat one is owned by a temple, three by panchayat, and 43 by private agencies (Table 2.7).

Table 2.7 Status of ponds in Mezhuveli panchayat

Sl. No.	No. of ponds	Ward	Lined or Not	Status	Ownership
1	3	I	Unlined	Perennial	Private
	4		Unlined	Seasonal	Private
	2		Lined	Perennial	Private
2	2	II	Unlined	Seasonal	Private
	2		Unlined	Perennial	Private
	1		Lined	Perennial	Temple
3	3	III	Unlined	Perennial	Private
	1		Lined	Perennial	Private
4	1	IV	Lined	Perennial	Panchayat
	4		Unlined	Seasonal	Private
5	1	V	Unlined	Perennial	Panchayat
	3		Unlined	Perennial	Private
	1		Lined	Seasonal	Private
6	3	VI	Unlined	Perennial	Private
7	4	VII	Unlined	Perennial	Private
	3		Unlined	Seasonal	Private
8	4	VIII	Unlined	Perennial	Private
	4		Unlined	Seasonal	Private

The majority of ponds are used for cultivation and irrigation. Most of the ponds are rather small in size and many are just shallow water pockets in paddy fields. Due to eutrophication many ponds find no use for drinking and domestic purposes. The ward-wise distribution of ponds and springs is given in Table 2.8.

Table 2.8 Distribution of ponds and springs in Mezhuveli panchayat

Sl. No.	Type	Ward								
		I	II	III	IV	V	VI	VII	VIII	Total
1.	Ponds: Perennial	5	3	2	2	4	3	4	4	27
	Seasonal	4	2	2	3	2	0	3	4	20
2.	Spring	8	2	1	0	3	3	5	1	23

A part of this panchayat comes under the area benefitted by the Pamba irrigation project. On the one hand it recharges wells in the area, but on the other it has led to waterlogging, which has a negative impact on land resource development.

Subsurface water

The panchayat has a well-distributed dug-well system with a density of 172 wells per sq.km. Wells are the major source of drinking water supply. Around 73 per cent of the households has their own wells and the rest depend on public wells. About 11,000 persons depend on the 2,469 wells for water for drinking and other domestic purposes. Although there are 16 borehole wells, less than 20 persons make use of them. In ward Number II, 356 wells are found to be non-perennial.

Potential areas of water availability

Fig 2.4 shows the areas of high, moderate, and low water potentiality as well as dry areas in the panchayat. Comparing this map with those on landform and we observe a close correspondence between water availability and geomorphology. Water availability in high relief areas is relatively low.

In many places, wells are dry during non-monsoon periods. Kanjirakkunnu, Chandanakkunnu, Malamehevarakkunnu, and Ullanarodikkunnu form part of the dry areas. The areas having moderate water potentiality lie along the side slopes and foot slopes.

The valley floors usually yield abundant water. The surface runoff is high and infiltration is low in the crests and steep-to-moderate sloping surfaces and consequently water availability is low. Water-harvesting can go a long way in solving this problem.

Landuse

Landuse survey was conducted by the volunteers. It showed that the general land utilisation pattern of the panchayat is similar to that of any other midland region. Agricultural land is utilised mainly for cash crops and wetland reclamation is taking place at a rapid rate in this area (Fig. 2.5). Landuse may be categorised under the four broad groups (Table 2.9). (i) seasonal crops; (ii) tree crops and orchards; (iii) plantation crops; and (iv) wastelands.

Area under seasonal crops

This category includes the area under paddy, tapioca, betal, plantains, and vegetables. It covers an area of 2.14 sq.km or 15 per cent of the total area of the panchayat. Paddy is the dominant crop and covers 1.72 sq.km followed by tapioca.

Most of the area which was previously under paddy is now under plantain, betal, and tapioca. Phenomenal decline in area under paddy is observed.

Of 4.97 sq.km of lowland (valley floor), only 1.72 sq. km is under paddy cultivation. The rest 3.25 sq.km area has been diverted to other uses: settlement, tree crop culture, road construction, and other non-agricultural activities.

Table 2.9 Landuse of Mezhuveli panchayat

Sl. No.	Landuse category	Area in sq.km	Percentage
1	Total area	14.40	100%
2	Area under Wastelands	0.14	
	Uncultivable	0.11	1%
	Cultivable	0.03	
3.	Area under seasonal agriculture	2.14	
	Rice (Single crop)	0.66	
	Rice (Double crop)	1.05	
	Rice (Triple crop)	0.01	14.8%
	Tapioca	0.36	
	Betal	0.03	
	Plantain	0.02	
	Vegetables	0.01	
4.	Area under tree crop/Orchards	4.88	
	Coconut	0.17	33.8%
	Arecanut	0.01	
	Mixed crop (including coconut)	4.70	
5.	Area under plantation crop	7.28	
	Rubber	7.09	50.4%
	Cashew	0.19	

We have examined the productivity of selected crops and compared it with their State averages to assess the performance of agriculture (Table 2.10). The productivity of paddy is higher and that of plantains and tapioca are lower than the State average. Still, the area under paddy cultivation has been declining over the years. The factors responsible for decline are mostly economic and need in-depth analysis, which is beyond the scope of this study. However, it may be indicated that agricultural planning should take note of the high production potential of certain crops in the area. Analysis of land suitability for agriculture practices is, therefore, of great importance for micro-level planning.

Table 2.10 Area and productivity of selected crops in Mezhuveli panchayat

Sl. No.	Crops	Area in hectare	Percentage	Productivity (kg/hectare)	State Average productivity (kg/hectare)
1	Paddy	172.40	12.20	2425	1973
2	Rubber	709.00	49.42	1250	794
3	Tapioca	36.00	2.65	10000	19112
4	Cashew	19.00	1.32	1000	899
5	Plantain	2.00	0.19	2000	7592
6	Coconut	17.00	1.18	1750 (no./hectare)	5362 (No./hectare)

Area under tree crops and orchards

In this category, area under fruit-bearing trees like coconut, arecanut, mango, and jack fruit and other non-fruit-bearing trees is included. An area of 4.88 sq.km (or 33.8 per cent of the total geographical area of the panchayat) comes under this category. En bloc coconut plantation is found to cover an area of 17 ha.

However, productivity of coconut is very low when compared to the State average. The low productivity of coconut is due possibly to lack of irrigation, inferior traditional varieties of trees, pest attacks, and crop diseases.

Area under plantation crops

Area under rubber and cashew plantations comes in this category. Rubber, the dominant crop in the panchayat, covers an area of 7.09 sq.km (or 49 per cent of the total area). The slopes and valleys are covered by rubber plantations and the predominance of the crop is due to expectations of high and quick economic returns from it. Productivity higher than the State average was also an additional incentive for expanding rubber plantation. Cashew is also raised in 19 hectares.

Wastelands

Wastelands include both cultivable and uncultivable areas. They cover an area of 14 ha. The uncultivable wastelands comprise sacred groves, parks, and open space in crest areas. Since settlements lie dispersed in agricultural areas, they cannot be separated. However, it is estimated that around 64 ha. of built up area is merged with the total agricultural area.

Assets

The assets map was also prepared by the volunteers. All the infrastructural facilities like service centres and other facilities found in the panchayat are depicted in this map. Spatial distribution of wells and water structures are also noted. Data on wells have been used for assessing water availability. Details about assets are discussed in the section which deals with analysis of spatial planning.

Environmental appraisal for landuse planning

This is a derivative map prepared by synthesising all information obtained through geoscientific investigation and surface mapping by volunteers. Integrated mapping units (IMU) have been identified by combining landform and surface material.

For each of the IMU erosion, water availability, existing landuse, and desirable landuse/ environmental evaluation/suggestion have been worked out (Fig. 2.6). Table 2.11 gives information on environmental appraisal for landuse planning for Mezhuveli panchayat.

Table 2.11 Environmental Appraisal for Landuse Planning in Mezhuveli Panchayat

Landform	MU	Area (Sq.km)	Slope	Erosion	Water availability	Existing Landuse	Desirable landuse/Environmental Evaluation/Suggestions
Elongated ridge crest	T_1L	0.53	< 5°	Low	Low	Rubber, tapioca coconut	Erosion prone along the fringe of the crest, requires intervention for water supply; tapioca cultivation to be phased out; Ground water potential needs to be enhanced
Hill crest	T_2L	0.64	< 5°	Low to Moderate	Low to Moderate		The existing landuse to continue
Steep side slope	S_4L	0.52	19°-27°	High	Low		Erosion is high in the lower part; needs further soil conservation measures like vegetative screening, contour bunding, terracing etc. Water harvesting methods required
Moderately steep side slope	S_3L	1.41	10°-18°	Moderate	Moderate		Soil conservation methods must be adopted; requires base cover
Moderate side slope	S_2L	4.91	5°-10°	Moderate	Moderate		Vegetable gardening; tapioca cultivation to be phased out
Gentle side slope	S_1L	0.79	<5o	Low	Moderate	Ginger	Coconut, ginger, vegetables, plantains may be promoted
Foot slope	FSL	0.67	<5°	Low	Moderate	Tapioca	Coconut, plantain, tapioca, vegetables should be promoted extensively
Valley floor	V_1A	4.97		Low	High	Betal	Rice cultivation is the proper landuse. But betal, tapioca, ginger can be rotated. Permanent reclamation into rice field should be strengthened

Problems and suggestions for action plan

From the resource survey and the subsequent interaction with the panchayat personnel, the following points have emerged for action planning.

(i) The areas coming under Chandanakunnu, Ullanthamodi colony, Kaniramkunnu, and Maladevankunnu experience shortage of drinking water. All these places are located over the ridges. Water harvesting is one of the measures that could be resorted to solve this problem. Roof water harvesting may be one of the options.

(ii) Owing to leakage of the aquaduct constructed for the Pamba Irrigation Project, valleys cultivated with paddy get waterlogged. Proper drainage facilities need to be provided to improve the situation for raising a third crop of paddy and for checking excessive soil wetness.

(iii) Nearly one sq.km area distributed in S3 and S4 slope category is susceptible to erosion. Soil conservation measures, such as contour bunding, vegetative screening, developing basal cover etc may be tried.

(iv) As rubber plantation and mixed crops cover more than 90 per cent of total area of the panchayat, it is necessary to introduce some basal cover crop to stem the runoff and facilitate infiltration, so that the water potential in the area is enhanced.

(v) A number of ponds in the panchayat remain silted up and with reduced storage capacity. These ponds need desiltation and proper protection of their catchment. These measures will, not only improve the source of ground water, but facilitate aquaculture as well.

(vi) The 23 springs found along valleys and valley heads have to be properly managed and tapped for drinking water.

Achievements

Achievements of the activities are discussed in terms of physical targets and initiation of the process. The initial target to cover all the 991 panchayats of the State by 1995-'96 could not be achieved. The achievements made by the end of 1998 are shown in Table 2.12.

Table 2.12 Progress of PRM activity

Sl. No.	Status	Number of Panchayats
1.	Panchayats covered by Landuse and Asset mapping	165
2.	Panchayats covered by Landuse and Asset mapping and land and water resource survey	45
3.	Panchayats for which maps have been drafted and distributed	160

About 20 per cent of the target was achieved. The reasons for this shortfall are discussed in the next section. A committee under the chairmanship of Prof. L. S Bhat was appointed by the Government of Kerala in 1997 to go through all the aspects of PRM. The committee observed that despite the shortfall, PRM has succeeded in arousing the interest of the local people and gaining their acceptance as a device for identifying development schemes. Success of PRM in achieving the objectives, for which it was taken up, varied among panchayats, from 'very high' to 'very poor'.

By far the most important contribution of PRM is that it was able to initiate a process of generating and utilising micro-level data for planning. It also had given confidence to local people for taking up the planning exercise. These points will be elaborated further in the ensuing discussions.

Problems of initiating Panchayat Resource Mapping

As indicated above, the initial target could not be accomplished for a variety of reasons. In this section, an attempt is made to discuss the difficulties faced by the panchayats while initiating PRM.

Mobilisation of volunteers

One of the major objectives of the PRM project was to mobilise local volunteers for conducting landuse and asset mapping. For this purpose, minimum of five volunteers were required per panchayat ward for a period of 8-10 days. This means that 500 to 600 mandays were required for the mapping work alone. Many of the panchayats found it difficult to harness this amount of manpower.

There were occasions when new faces joined the team after every two-to-three days. This excessive turnover of the personnel caused considerable slow down of the work.

Inadequate preparatory work

PRM was initiated without much of a preparation for mobilisation of volunteers. Non-completion of work in the Thrissur district in 1993-'94 is a typical example. College students participating in the PRM activity found the work uninteresting after an initial phase of enthusiasm. One of the lessons of this experience is that PRM activity cannot be sustained without proper environment building in the localities concerned.

Lack of adequate technical manpower

The demand for involvement of technical personnel in this programme is much larger than in other participatory programmes. Sufficient technical manpower was not available to execute it on a wide scale. The technical personnel deployed to execute this project were purely temporary hands.

Lack of co-ordination

This programme could not draw necessary support from other government departments and institutions despite repeated attempts. It became the sole responsibility of CESS to carry forward this programme.

Lack of perspective

Owing to lack of proper perspective the PRM activities were reduced to the status of an exercise of mapping to be done by the volunteers. The purpose of this mapping and an understanding of the post-mapping activities could not be inculcated properly among the technical personnel and the volunteers. Naturally, therefore their involvement became unenthusiastic. Moreover, after mapping was completed, no tangible activity could be initiated in the field. This also had a certain negative impact.

Work volume

The volume of work involved was huge. The drafting of maps, which was necessary for presenting the results to the panchayat, was found to be an enormous task. The drafting infrastructure in CESS proved to be inadequate. Even hired extra help could not complete the job in time.

Size of the project

The very size of the project was too large for implementation by a small institute like CESS. Although the problem had been realised and discussed in 1993 itself, no substantial attempts were made to improve the situation.

3. Panchayat-level planning: An overview

This section is purported to discuss briefly about the panchayat-level planning in general and thereafter to provide an overview of the initiatives that are going on in the State.

Panchayati Raj in India

Local government with active people's participation had existed at the village level or hamlet level in India from very ancient times. The Russian 'Mir', the German 'Mark' and the English 'Manor' of mediaeval times may be considered the counterparts of Indian village panchayat.

In recent times, 'Panchayati Raj' was established soon after independence and by 1959 it became operational. The Asoka Mehta Committee (1978) identified three phases of Panchayati Raj in the country. The first phase began in 1959 with considerable promise to uplift the rural masses. Article 40 of India's Constitution reads thus: "The State shall take steps to

organise village panchayats and endow them with such powers and authority as may be necessary to enable them to function as local self government". The second phase, marked as a phase of stagnation, was during 1965-'69. The third phase from 1969 to 1977 was a period of decline.

After 1977, the decline was even more rapid at the country level; however, State-level initiatives began taking root. The Left Front government in West Bengal conducted election to panchayats in 1978. Since then panchayat elections were held regularly at five-year interval. A three-tier panchayat system took shape in West Bengal. There are Zilla Parishads at the district level, Panchayat Samiti at the Block level and Anchal (or Grama) panchayats (clusters of 10-12 villages) at the lowest level.

Panchayat elections were held in other States also from time to time. However, perhaps only in West Bengal did panchayats function effectively and performed local planning activities. The 73rd and the 74th constitutional amendments in 1992 gave a new fillip to the Panchayati Raj movement. Articles 243 G in the 73rd amendment and Article 243 W in the 74th amendment specifically empower local self-governments to take up the responsibilities of preparing Plans for economic development and social justice and implementing them within their respective jurisdictions. With the democratic and institutionalisation process in progress, area development now moved on "to fresh woods and pastures new" and reached the grassroots.

Establishment of Panchayati Raj was therefore a part of Constitutional obligation and a step towards local area planing. It opened up a significant opportunity for the people and the planners to come together and act in unison at the village level. As Sundaram pointed out, local-level planning has come a long way from its beginning as a partial and fragmentary effort about three decades ago to its present role as a pragmatic tool for multilevel and integrated planning for the rural people and their resource base (Sundaram, 1998: 13-20).

West Bengal made full use of the opportunity afforded by this Constitutional safe guard and moved further ahead in strengthening the Grama Sabha and subsequently made it obligatory for them to propose Plan activities. To evaluate the Grama Panchayat activities, a committee was appointed by the Government of West Bengal in 1993. This committee (Mukherjee and Bandyopadhyay, 1993) conducted a thorough analysis of the functioning of panchayats in West Bengal and made specific recommendations to strengthen panchayati raj institutions in the State. Some of their major recommendations are listed below.

(i) The panchayats in West Bengal, the first of a new generation of political panchayats, have made significant achievements and rural development in physical terms; however, and more importantly, Panchayati Raj has increased the level of social and political awareness among the people and facilitated the development of local level leadership. This achievement has strengthened the roots of democracy in the State.

(ii) It is of great concern that the initial enthusiasm has largely faded and panchayats are engrossed once again in routine work mostly under Jawahar Rozgar Yojana (JRY).

This lacuna has been enquired into from conceptual as well as from a programme dimension.

Among the several points mentioned under the conceptual category, the following are important in the context of our present study.

(i) The panchayats remain locked up in a 'development bind' and the wider purpose of self-government is often lost sight of. The fundamental policy issue for local self-government must be stressed in the panchayat law and pace should be set to blend the development function into the self governance functions.

(ii) If the panchayats are to be truly self-governing, their functional and financial autonomy should go beyond assignment of functions and devolution of funds.

(iii) Panchayats have little control over the development staff. Self-governing panchayats with a wide array of functions will need strong administrative and technical support.

(iv) The panchayats are at present, not concerned about financial self reliance. With near zero self reliance, there is near zero autonomy and correspondingly near zero self-government. By failing to mobilise resources, the panchayats have increased the cost of governance, because now their own cost has to be added to the cost of the pre-existing system.

(v) Multi-level self-government requires that the different layers do not operate in isolation from each other. Panchayats should be organically linked with each other and with the State government.

The points mentioned in the West Bengal programme and relevant for our present study are the following:

(i) Panchayats without programmes are as meaningless and potentially dangerous governments without policies. The panchayats should be armed with programmes to meet the growing hopes and aspirations of the people.

(ii) A State-wide programme should be undertaken to bring together the actual tillers of land for effective entrustment of all cultivable land to them. This is the logical next phase of land reforms implemented in the State.

(iii) A major shortcoming is the absence of seasonal field-wise crop surveys. Without statistical evidence, it is not possible to compute output for any particular season or crop. A month-wise and season-wise record in prescribed form of crop grown field by field, is essential to develop an authentic data base for the entire State. The PRM model adopted in Kerala could be put to use for this purpose.

(iv) The panchayat must prepare and implement area-specific Plans vigorously for agricultural development.

(v) West Bengal should consider launching a land-literacy programme involving science 'for and by the people' for which the panchayats should mobilise the people (in the pattern of Kerala).

(vi) Focal points and growth centres should be developed to maximise the benefit of decentralised planning. Marketing facilities should be developed as part of spatial planning.

(vii) Panchayats require the help of experts in physical planning. Adequate research and training are required at different levels.

This review of activities pertaining to West Bengal brings out interesting points that have been addressed in PRM programme in Kerala.

People's Plan Campaign in Kerala

The year 1996 witnessed a novel experiment in panchayat planning in Kerala unleashed by the Kerala State Planning Board. Till then, panchayats in the State were performing a few conventional functions in a ritualistic fashion. Initiation of the People's Plan Campaign opened up many novel possibilities addressing numerous issues which had come up in the context of the functioning of panchayats in West Bengal (Gulati & Issac, 1997; Issac & Harilal, 1997; Bandyopadhyay, 1997; Chattopadhyay, 1998). Some salient points in the process are indicated here.

Grama Sabha

Grama Sabha initiated the planning process by listing the felt needs of the people and their development perception.

Resource potential

After identification of the felt needs, the next step was to make an objective assessment of the resources locally available. In order to accomplish this, a series of participating activities were taken up. These were:

(i) Collection of secondary data;
(ii) Transect walk to study local geography and natural resources;
(iii) Review of ongoing schemes;
(iv) Survey of local history; and
(v) Preparation of Grama Sabha reports and their consolidation.

Development Report

Gram Sabha reports were consolidated to prepare the development report for each panchayat.

It consisted of two parts. The first part covered a review of the administration and local history highlighting the role of social movements at local level.

Analyses of natural and human resources were also provided in this part. The second part comprising 12 chapters, dealt with the various development sectors individually.

This exercise helped in
(i) generation of an extensive local data base;
(ii) review of all development sectors; and
(iii) indication of broad solutions to the development problems, as perceived by the local people.

Formation of task force

Task forces were constituted in order to cover the various development sectors outlined in the development report. On an average, there were 12 task forces in each panchayat. Members of the task forces, mostly local experts, were trained to prepare project reports for sectors assigned to them. These reports are expected to have eight sections, namely, Introduction, Objectives, Beneficiaries, Activities, Organisation, Financial Analysis, Achievements, and Monitoring.

The Planning Board review showed that the task forces did not function as effectively as expected primarily due to the inadequacy of experts available at the disposal of the panchayats. There were also dearth of technical personnel and financial analysts to support this huge endeavour.

Plan document

The Plan document emerged on completion of the exercise by the task forces. This Plan document comprised eight chapters.

(i) Introduction: Dealing mainly with development challenges;

(ii) Development strategy stating inter and intra-sectoral priorities, policy issues, and outlay;

(iii) Resource mobilisation: Containing estimates of local resource mobilisation from various sources;

(iv) Sectoral programmes: Comprising a list of projects by sectors and sub-sectors;

(v) Integrated development: Consisting of a discussion of possibilities of backward and forward linkages of projects and integration of related sectors.

(vi) Welfare of Scheduled Caste and Scheduled Tribes: Discussing the guidelines for special

component Plan and Tribal sub-Plan;

(vii) Women's development programme: Examining the gender impact of the Plan and listing of projects included in the women component Plan.

(viii) Monitoring: Explaining the monitoring system.

Spatial integration

An attempt was made to integrate Plans which emerged from the Grama Panchayat, at the Block and the district levels. This effort was not effective to the desired extent for a variety of reasons.

Technical support groups

Considering the technicalities involved at the various stages of the exercise and the necessity for technical and financial appraisal of the projects at various levels, the voluntary technical corps (VTC) was raised. Retired technical experts and professionals were encouraged to enroll themselves as volunteers to appraise the projects and Plans of the local bodies.

Expert committees were formed at panchayat level, block level, and district level. These committees were not empowered to change priorities set by the local bodies. Their tasks were clearly confined to technical and financial appraisal of the projects and to providing suggestions for modification so that they might be made viable and feasible.

As a result of this exercise all the panchayats in Kerala produced a development report and Plan document. Over one lakh people had been trained for various time durations. Elected representatives were exposed to the technicalities of Plan preparation. The exercise was also cost-effective, mass-based, and time-bound.

Many of the issues raised in the review of West Bengal panchayat activities were addressed in the Kerala experiment. However, there were certain areas which needed to be strengthened, specially, in the sectors dealing with the data base. With the emphasis on local level intervention and given the scope and limitations of resource mobilisation, the Resource Mapping Programme (PRM) became important.

This fact was increasingly realised during the process by the different sections of the people including the panchayats.

In fact, during initiation of PRM, panchayats had to be persuaded to understand the scope of using PRM data for local level planning; now, with the introduction of the Plan campaign, PRM has turned out to be the sine qua non of panchayat planning in Kerala.

4. Use of PRM data for planning

The discussion in this section is on the (i) use of PRM data by the panchayat, (ii) problems or limitations of using PRM data, and (iii) scope and potential of using PRM data for planning.

Use of PRM data for Planning

In order to draw meaningful conclusions about the use of PRM data for planning at the micro-level, panchayats were selected for study with the following considerations:

(i) representation in the selected panchayats of the three physiography regions namely low-land, midland, and highland;

(ii) of the varied socio-political situation prevailing in the State; and

(iii) the different modes and time points of PRM execution.

However, during the course of the programme implementation a suggestion came up in an open house discussion that a few panchayats, in which PRM was not being introduced, should also be taken up in order to help comparison between the two categories (with and without PRM) of panchayats and bring out the utility of maps in planning process.

In the first instance, 11 panchayats were selected (Table 4.1 and Fig. 4.1).

Table 4.1 Panchayats considered for study

Panchayat	District	Physiography location	Year of PRM Exe-cation	Final selection
Onchiyam	Kozhikode	Coast	1991	*
Vazhayoor	Malappuram	Lowland	1990	*
Vallikunnu	Malappuram	Coast	1996	*
Poothadi	Wayanad	Plateau	1991	
Manaloor	Thrissur	Lowland	1994	
Madakkathara	Thrissur	Midland	1991	
Udumbanoor	Idukki	Highland	1993	*
Mezhuveli	Pathanamthitta Highland	Midland/	1991	*
Vellanad	Trivandrum	Midland/ Highland	No PRM	* *
Sreekariyam	Trivandrum	Midland	No PRM	
Peringamala	Trivandrum	Midland	No PRM	

After visiting all the 11 panchayats and discussing with various groups of people, six panchayats were selected for detailed analysis. The findings presented here are based on this exercise.

Opinions expressed by various groups about the utility of resource maps may be discussed under three broad heads: conceptual, managerial, and technical.

Conceptual

(i) The PRM programme had introduced a new awakening and kindled a new thought process in the case of resource-based planning.

(ii) People at large have become aware that resource mapping is important for the panchayat in its development process.

(iii) A sense of self-actualisation has permeated the volunteers by participating in the programme.

(iv) PRM helped motivating people to take part in development activity.

However, certain serious gaps remain at the conceptual level such as the following.

(i) People have not understood properly the concept of resource-based planning.

(ii) The idea of spatial planning could not be inculcated upon at the desired level.

(iii) While the concept was clear to some persons who took the lead in the execution of the programme, they did not transmit the idea to the community at large.

(iv) People were yet to visualise a total development process based on PRM data.

Technical

(i) PRM data were used mostly for drawing programmes under land and water management, particularly to propose watershed management projects to be funded under various schemes like CAPART.

(ii) The schemes for tertiary sector development emerged through discussions at the Grama Sabha. The PRM maps were hardly used for the purpose.

(iii) The panchayats covered under the programme had included PRM maps in their development reports, but the data were not fully assimilated for use in planning.

(iv) Both in the PRM and the non-PRM panchayats, people needed technical support for

formulation of action plans. In the absence of such support, the programme could not be made use for planning.

(v) People's participation reduces cost and time required for data generation considerably.

(vi) Data generated through PRM were not adequate for formulating action plans. For example, information on crop productivity, fertiliser use, labour input, soil quality, and water quality was not available in PRM maps.

(vii) Socio-economic data were essential for Plan preparation. Due to change in methodology from time to time these data were not collected in all PRM panchayats. Even in the panchayats in which they were collected, they could not be integrated with the bio-physical data obtained through the PRM exercise.

(viii) Even at the higher levels of Plan execution, clarity on utilisation of PRM data was lacking.

Managerial

(i) There was considerable enthusiasm in the beginning of the programme; however, over the time, the enthusiasm waned.

(ii) PRM succeeded through individual initiatives. Wherever the initiator or the motivator was in a commanding position, the work progressed smoothly.

(iii) Time gap between data generation and action plan preparation led to inertia among the volunteers.

(iv) There was an impression among certain sections that the programme was that of the political party in power at the panchayat or the State level. Persons belonging to other political parties had qualms about the programme.

(v) The common man viewed PRM as yet another government programme. The motivator could not help him surmount this mental block.

(vi) The voluntary agencies involved in the implementation of the programme tried to project it as their own. Such an attitude reduced, on the one hand chances of full participation of the people and on the other, created doubts in technical agencies about the validity of the technical data information generated by the programme.

(vii) Owing to the long time gap involved, female members who participated in PRM were not always available in planning phase.

(viii) Inadequate preparation at the panchayat-level had negative effect in the adoption

and implementation of the programme.

Vallikunnu

At its first meeting held in October 1995, the present Panchayat *Samithi* decided to conduct PRM in the panchayat. However, due to lack of response from the implementing agencies, the panchayat had to seek the intervention of a minister, and could get the programme implemented only in May 1996. With the participation of 135 volunteers (80 women and 55 men) and three technical persons, resource mapping and collection of socio-economic data were completed within 11 days, of which the first two days were devoted for preliminary discussions and training of volunteers. Thereafter, the drainage mapping and the general information survey were conducted in July-August 1996 and August-September 1996, respectively.

On our enquiry about the difficulties faced during the course of PRM activities, a panchayat member's response was that simultaneous resource mapping and collection of socio-economic data was difficult due to inadequacy of volunteers. During processing of the socio-economic data, some discrepancies were noted which had to be rechecked on panchayat's own initiative.

Barring two watershed management schemes identified through the maps, most of the action plans evolved during the Grama Sabha meetings. When asked whether there was a real need for PRM, as most of the action plans emerged from the Grama Sabhas, the panchayat member's reply was an emphatic 'no'. This indicated that the importance of spatial data base in planning was not fully realised at the ground level among planning functionaries and the general public.

Nonetheless, the member stressed that maps were essential for proposing projects to agencies like CAPART. Similarly, he agreed that the Asset map was of great use to identify the locations of the various institutions in the panchayat.

Another viewpoint which emerged during the discussion with the member was that in coastal areas maps were of little use in planning compared to socio-economic data. According to the member, this was due to the fact that there was no need for watershed management in the coastal regions. But, when the issues of sea erosion and saline intrusion, the member revised his standpoint. He agreed that the proposed watershed scheme - of constructing a bund as part of the watershed management plan - would significantly reduce the problem of saline water intrusion.

According to the member, the scheme of land-use classification of the panchayat did not provide adequate data to evolve crop-level strategies. The panchayat was concentrating on the fishery industry as it was considered lucrative.

The question whether the idea of PRM had seeped down to the level of the people, initially

elicited only a mixed response as listed out below:

(i) The entire activity began under the leadership of the panchayat president and only he could provide any information in this regard. The panchayat president strongly wanted Vallikunnu panchayat to rise to the level reached by the Kalliassery panchayat with respect to PRM activities in which the latter was the pioneer.

(ii) For the general public in the panchayat, the PRM was just another government programme launched with the support of the dominant political party. During the discussion, it became obvious that the panchayat was not very clear about how to translate PRM programme into Panchayat-level Planning (PLP). As part of making people aware about the advantage of PLP, the panchayat had widely publicised the salient features of PLP.

(iii) The programme on widening and deepening of a small stream launched on March 30, 1997 met with success due to wholehearted participation of around 2,400 people. The success of people's participation in local development activities depends on the degree of involvement of the volunteers.

(iv) In the case of one of the major objectives of PRM - land and water management for sustainable development - the panchayat could not take much initiative. One of the examples was the case of sand-mining from river beds. Owing to dependency of a large number of persons in this activity, no steps could be taken to check sand mining. The interesting point is that the panchayat members were well aware of the environmental problems associated with this operation. They also felt that there was a need to make people aware and to convince them to chalk out sustainable strategies. The idea of judicious resource management, for which the PRM is expected to contribute, would take time to get diffused among the people.

Vazhayoor

In 1989, with the active participation of young volunteers, Vazhayoor panchayat (with 10 wards) came out with a map showing the distribution of water bodies in the panchayat. This was an eye opener to the local community and helped, in confidence building of the scientific community to involve the local volunteers in PRM activities. However, according to local people, even though PRM was undertaken in 1990, on lines quite similar to those of total literacy movement, no follow up action took place in Vazhayoor until the Plan campaign began in 1996.

Further, they held the view that even if one could find ward-level maps in the Development Report, the PRM maps were of limited use for the formulation of action plans. Almost the entire plan was prepared based on Grama Sabha deliberations. When asked for more details on map utilisation, the panchayat at personnel directed us to meet a person who was at the time engaged in helping panchayat activities in the Kondotty Block to prepare development plans.

Since the persons we discussed with were intimately connected with formulation of the PRM programme their responses could have been biased. However, their response to the specific question, "What were the maps prepared and in what way were the maps used for preparing the action plans?", is the following:

(i) Land Use maps were referred for agricultural planning, mainly Garden Agriculture.

(ii) Environmental Appraisal Map was used to identify the areal extent and to regulate clay mining; the mined area usually got replenished within five to six years through floods. According to the PRM initiator, the people in the panchayat were ignorant about the adverse effects of clay mining in the long run. Since a large number of persons found this as a means of living, only phase by phase reduction of this activity could be envisaged in the action plan. But, strict rules to check further mining was being implemented at a few critical locations.

It did not become clear from the discussion as to how the maps were used for Plan formulation. While discussing the status of PRM programme it was stressed by the local people that only voluntary organisations with scientific outlook will be able to carry out the PRM programme.

Vellanad

The Vellanad panchayat in Thiruvananthapuram district comprises 11 wards; it was one of the panchayats selected to study the ways in which action plans were worked out without PRM data.

The responses received to questions on methods of Plan formulation were of the following types:

(i) Plans emerged from deliberations at the Grama Sabha level.

(ii) Major suggestions came from non-governmental social research institutions which employ PRA tools extensively;

(iii) Some of the Plans were suggested by voluntary groups and a few others by technical persons.

To the question "Why had the panchayat not taken up the initiative to implement PRM ?" - we received different types of responses as shown below.

Panchayat members

Some correspondence with the implementing agency had been done but somehow it could

not yield any tangible result. If we had approached voluntary organisations for help in implementation of PRM they (voluntary organisations) would have tried to take full control of the programme and the projects themselves and posed as initiators of the programme.

Voluntary organisation

Although, around 100 to 125 members were available with our organisation, most of them did not find time to get involved this time-consuming activities like mapping and data collection.

Non-Governmental social development institution

We never approached the implementing agency, as we were satisfied with our social mapping work which was an exercise in PRA methods.

Scientific and technical experts

Panchayat officials were interested more in playing group politics rather than attending to the issues and problems faced by the public.

Udumbanoor panchayat

The PRM exercise in Udumbanoor panchayat was undertaken in 1993 with the participation of trained volunteers. It was taken up through the individual initiative of persons who had a clear idea about the benefits of PRM programme.

This is one of the first 25 panchayats considered to have worked out a standardised PRM methodology with financial support from the Department of Science and Technology of the Government of India. Implementation of the mapping programme in this panchayat was successful. The results of the present research are presented in the following section.

(i) The panchayat office received the PRM maps.

(ii) A large majority of the government officials present in the panchayat office had previous knowledge of PRM implementation in the panchayat; but on enquiry, we realised that they had no clear answer to questions on the uses of PRM. They directed us to meet either the elected members of the panchayat or the individual who had taken active role in PRM implementation. Our meeting with the elected members of the panchayat yielded the following information:

(a) The maps were partly used in the case of Plan formulation such as identification of

problem areas and submission of schemes for drinking water supply, soil conservation, and to some extent crop conservation (major portion of land in the panchayat is used for the cultivation of rubber and the valleys are reclaimed for raising tree crops) ;

(b) However, the maps were not explained properly at the ward/Grama Sabha level, resulting in marginal use of maps for Plan preparation at the lowest level;

(c) Owing to paucity of detailed socio-economic data, they were constrained to formulate plans on the basis of estimated figures drawn up during discussions among the panchayat members;

(d) Volunteers should be given incentives for sustaining their interest in continued participation in mapping as well as planning.

(e) Women volunteers who participated in the PRM exercise were not available during the planning phase due to various personal reasons. Male volunteers, due to lack of incentives, hesitated to participate. Further, since the work environments of mapping and planning were not exactly the same, there existed a general lack of interest among the volunteers to participate in planning processes;

(f) The long time gap between PRM and planning resulted in lack of motivation on the part of the volunteers.

Panchayat's initiative for planning

A sample study on panchayat's planning initiative is presented here. In Vallikkunnu panchayat, PRM was completed in a record time of 11 days followed by a socio-economic survey. It was at the instance of the Panchayat President that the programme was taken up.

It was broadly agreed that PRM helped the panchayat to respond positively to People's Plan Campaign and to undertake various land and water-based programmes though there were differing opinions about the utility of PRM data. The different projects undertaken in 1997-'98 are given in Table 4.2.

The major programmes were in the areas of irrigation, sea wall construction, energy conservation, and drinking water augmentation. Labour contribution from the local volunteers varied from 247 per cent to 804 per cent of the panchayat's expenditure for all the programmes together. On an average, it came to 463 per cent.

Table 4.2 clearly shows the details of the benefits accrued from the implementation of the programme. This is one of the cases in which the panchayat was able to use Panchayat Resource Mapping data and move further ahead to collect additional data required for Plan preparation.

Table 4.2 Janakeeyasootranam (peoples' planning)1997-'98; Vallikunnu Grama Panchayat

1	2	3	4	5	6	7	8	9	10	11
Sl. No.	Date	Name of Projects	Length x Breadth	No. of Persons	Time in hours	Panchayat Fund allotted in Rupees	Peoples' Labour Contribution Rs.	Percentage of Labour Contribution %	Women Participated	Benefits by Implementation
1.	30.3.97	"KATTUNGAL THODU" IRRIGATION PROGRAMME	1650m x 3m	2442	6	54,323	2,50,000	460%	269	100 Acres-1 crop increase (1960 acres irrigation).
2.	5.6.97	"MUDIYAM BRACH" PEOPLE'S SEA WALL CONSTRUCTION	50m x 13 Bag Length	300	6	12,830	31,750	247%	100	1 House of Fishermen& Tippu Sultan (150m) Road + shore protected
3.	22.3.98	"MALAYATTIL THODU" IRRIGATION PROGRAMME	1643m x 2m	600	6	13,254	64,800	482%	150	400 acres of Paddy directly + 1230 acres coconut indirectly
4.	8.3.98	"AFRICAN-WEED" REMOVAL PROJECT (BIO-MANURE PREPARATION PROJECT	8 Compost Pits	600	6	15,948	1,43,800	804%	100	42 acre Additional area + manure for Rs.80,000
5.	4.4.98	"KUNDAM PATAM" IRRIGATION PROGAMME)	1525 m x (3m 6m)	2400	6	58,672	2,62,550	489%	300	250 acres of paddy + Boost to L.I. Scheme

1	2	3	4	5	6	7	8	9	10	11
6.	30.5.98	"KADALUNDI KADAVU" BOAT JETTY CONSTRUCTION PROJECT	120m wall x 62 cent Sand filling	953	6	34,803	1,03,220	297%	70	100 Boats Protection New Jetty + High labour contribution
7.	28. 6.98	ENERGY CONSERVATION (C.F.L) PROJECT	10000 CFL (1.W)	3004 Houses +300 Shops	5	4,58,210	BEN: 6,14,550 DON: 10,00,000 OTHERS: 2,20,340 18,34,890	352%	-	Energy for Rs.100 lakhs Conserved + Solve voltage drop
8.	23.7.98	'BALATHIRUTHI' SWASRAYA DRINKING WATER PROJECT	Well-1 Tank-1 5HP Motor-1	20 houses	3 months	65,000	2,21,000	340%	-	20 families get clean water bundantly timely + solves drinking water problem
		Total				6,11,685	28,32,010	462.9%		

Sd/-

President

Vallikkunnu Grama Pacnchayat

JANAKEEYASOOTRANAM (PEOPLES' PLANNING) 1997-'98
VALLIKKUNNU GRAMA PANCHAYAT

	Name of Project	Details of Benefits after Implementation
1.	"KATTUNGAL THODU" IRRIGATION PROGRAMME	1. One crop of additional paddy cultivated 2. Improved production over 250 acres 3. Agricultural destruction due to flood, avoided 4. No serious flood; No farmers removed from houses 5. Satisfaction & better hope developed among farmers 6. Very high peoples' labour contribution raised 7. Award obtained
2.	"MUDIYAM BRACH" SEA WALL CONSTRUCTION	1. Shore of 50m protected in 1996-97, 97-98, 98-99 2. Fishermen's house (One) protected 3. Mass action united people for social work 4. Got priority from Govt. for sea-wall-repair works 5. Tippu sultan road protected
3.	"MALAYATTIL THODU" IRRIGATION PROGRAMME	1. Water stagnation over 100 acres avoided, paddy cultivation over 400 acres improved 2. Coconut cultivation over 1200 acres benefitted 3. Mass action improved development quality 4. Transparency increased; corruption vanished
4.	"AFRICAN WEED" REMOVAL PROJECT (BIO-MANURE PREPARATION PROJECT)	1. African weed over 42 acres of paddyfield burnt into ashes, and new crop started 2. Bio-fertilizer prepared in 8 compost pits; and raised Rs.80,000 by manure 3. African weed from water in canal over 10-15 acres removed 4. Mass action created mega-profit

	Name of Project	Details of Benefits after Implementation
5.	"KUNDAM PATAM" IRRIGATION PROGRAMME	1. Paddy crop distruction over 250 acres prevented 2. Productivity & quality of crops increased 3. New Canal of 500 m constructed 4. Sanction for Kakkathodu L.I Scheme - ensured 5. People's participation on mass level in development activity became easy & effective
6.	"KADALUNDI KADAVU" BOAT JETTY CONSTRUCTION PROJECT	1. 62 cents of land formed as a Jetty for boats 2. 100 boats can be landed on the jetty 3. Loss & Damage tp boats - avoided 4. Illiterate & Poor peoples were rallied under mass action 5. People identified the advantage of Peoples' Planning
7.	ENERGY CONSERVATION (C.F.L) PROJECT	1. Vallikunnu panchayat could conserve electrical energy used for lighting by Rs.100 lakhs/year 2. The problem of Voltage drop is partially solved 3. Monthly current charge decreased 4. Advantage of CFL over MFL is widely propogated
8.	BALATHIRUTHI SWASRAYA DRINKING WATER PROJECT	1. 20 families get pure drinking water lavishly and timely 2. Cash Donation by people's became noteworthy 3. Way opened for solving problem of water scarcity 4. Motivated to take up more projects (in 1997-98=7, 1998-99 =9) in Vallikkunnu.

Sd/-
President
Vallikkunnu Grama Panchayat

Scope and potential

The Panchayat Resource Mapping programme is gradually emerging as a felt need of the panchayat. It is quite natural that the process of using PRM data is beset with a host of problems. It must be noted that this venture is the first of its kind in the country.

Data requirement for successful Plan preparation is by now well realised by the people in the panchayat. Even regular Government programmes like wasteland development, watershed development, and hill area development lay stress on providing plot-level data.

Such a large mass of data is useful for a variety of purposes. The utility of data for plan formulation and implementation is very high. What is required is proper planning for making use of the data.

We will demonstrate in the next section some uses of the resource maps for preparing spatial Plans at the panchayat level.

5. Spatial data analysis - A sample exercise for Mezhuveli panchayat

One of the objectives of launching PRM was to prepare spatial Plan for the panchayat based on the primary data generated through this exercise. Review of the planning process in selected panchayats indicated that the concept of spatial planning had not been internalised by the panchayats due to various reasons, though many of the activities undertaken by them were closely associated with spatial planning.

The objectives of this section are to bring out the spatial gap in resource availability and use to develop a hierarchy of functional nodes having their own hinterlands. In the process, it is possible to lay the foundation for total area development.

Education, health, and other social sectors as well as land and water management are considered for this exercise.

Mezhuveli panchayat is taken up as sample. The resources mapping programme undertaken in this panchayat was mentioned earlier. In this section we make an analysis of the spatial data emerged through PRM supplemented by other available information essential for planning purposes.

Resource base of the panchayat

Natural resource base of the panchayat was discussed in the previous section. Demographic characteristics, infrastructural facilities, and institutional aspects of resource

use are discussed here. The spatial gaps will be identified under each aspect.

Demographic characteristics

Population data for 1991 at the ward level were collected from Census Hand Book. Total population of the panchayat is 14,121 of which 52.40 per cent is females. The general trend in the State of a sex ratio in favour of females is obtained in this panchayat also. Since this panchayat is located in a remote rural area, the well-known demographic peculiarities in Kerala are found to be pervasive, not restricted to urban areas alone.

Scheduled Caste population accounts for 21.5 per cent. The percentage is higher (32.8 per cent) in Ward VII. Except one person in ward IV, there is none in the panchayat belonging to Scheduled Tribes.

Literates account for 96 per cent of the total population of 7 years and above. There are 27.60 per cent of the total population as main workers - 46.9 per cent among males and 10.1 per cent among is females. Table 5.1 provides the ward-level details.

Table 5.1 Ward-wise demographic characteristics of Mezhuveli panchayat

W	Total Population			Scheduled Castes (%)			Literates (%)			Main Workers (%)		
	T	M	F	T	M	F	T	M	F	T	M	F
1	1885	923	962	21.6	22.0	21.2	89.1	88.4	89.8	27.4	44.1	11.9
2	2355	1089	1266	18.8	19.2	18.5	88.9	88.2	89.5	25.3	45.8	7.7
3	1554	726	828	14.0	18.0	14.1	89.9	90.1	89.9	26.4	44.8	7.9
4	2070	985	1085	20.4	20.3	20.6	90.0	88.1	91.6	31.1	47.3	16.3
5	2067	997	1070	20.9	21.4	20.5	89.7	88.7	90.7	27.6	47.7	8.9
6	1887	902	985	28.7	23.9	23.6	88.4	85.8	90.8	27.1	50.4	5.8
7	1310	637	673	32.8	32.9	30.9	90.5	89.6	91.4	28.9	44.9	13.6
8	993	463	530	20.3	20.7	20.0	91.3	92.7	91.2	27.4	51.8	6.0
T	14121	6722	7399	21.5	22.2	20.9	89.72	88.95	90.61	27.6	46.9	10.1

Note: W= Ward; T = Total; M = Male; F = Female

Population density distribution

Population density of the panchayat is 978 persons per sq.km in 1991. It varies from 820 persons in ward I to 1,138 persons in ward II. There are five wards, where population density is more than 1,000 persons.

Household density varies from 173 per sq.km in Ward I to 266 persons per sq.km in Ward V, the average for the panchayat being 229 (Table 5.2).

Table 5.2 Ward-wise density of population and household

Wards	Area (sq.km)	Population	Population Density	No. of households	Household Density
01	2.30	1,885	820	445	193
02	2.07	2,355	1,138	547	264
03	1.43	1,554	1,087	357	250
04	2.40	2,070	863	487	203
05	1.88	2,067	1,099	500	266
06	2.17	1,887	870	428	197
07	1.27	1,310	1,031	301	237
08	0.92	993	1,079	242	263

Occupational structure

The percentage of main workers to total population varies from 25.30 per cent in ward II to 31.10 per cent in ward IV (Table 5.3). As much as 37.43 per cent of total workers is engaged as cultivators. Ward VIII has 57 per cent of its workers as cultivators.

The primary sector accommodates 67 per cent and the tertiary sector 24 per cent of total working population. The secondary sector is small and accounts only for about 8 per cent.

Development of the primary sector, particularly through increase in productivity levels is important since it is the surplus from this sector that could be invested in the secondary sector.

Land holding and group farming

The size distribution of land holdings is one of the parameters that directly and indirectly affects land utilisation. Around 96 per cent of holdings were found to possess below one hectare of land each (Table 5.4). Considering the type of land available in the panchayat, it is obvious that these small holdings are partly seasonal crop land and partly garden land. It is generally observed that paddy fields are highly fragmented.

Therefore, consolidation of land by adopting group farming methods seems essential. Initiatives are already taken in this matter. Five group farming committees have been formed (Table 5.5). Already the five wards which possess a comparatively large area under wetlands suitable for paddy cultivation, have taken to group farming.

Amenities

The Asset map prepared by the volunteers brings out all the details about spatial distribution of amenities. It covers road networks, schools, hospitals/health centres, post office, markets, shops, banks, and a host of similar establishments.

Table 5.3 Occupational Structure of Mezhuveli Panchayat

Ward	Total Main Workers	Culti-vators	Agricultural Labourer	Livestock, Fishing, Hunting Plantation Orchards	Mining & Quarrying	Manufacturing, Processing, Servicing & Repairs in house hold industry	Manufacturing, Processing, Servicing & Repairs in other than house hold industry	Construc-tions	Trade and Comerce	Transport Storage & Communi-cations	Other Services
1	27.40	32.30	35.80	2.70	0.77	0.97	2.70	2.50	6.40	2.30	13.56
2	25.30	41.80	24.30	2.90	0.17	0.33	4.40	2.90	5.90	3.60	13.70
3	26.40	24.60	32.60	0.72	-	3.20	4.60	1.90	9.70	2.40	20.30
4	31.10	36.20	27.10	0.93	0.16	1.70	3.70	3.30	5.30	3.30	18.31
5	27.60	39.90	28.70	2.50	-	3.10	2.30	2.50	4.70	2.80	13.50
6	27.10	50.60	18.80	1.20	-	2.10	6.10	3.10	7.20	2.10	8.80
7	28.90	18.00	36.00	2.90	0.26	1.60	2.60	6.30	11.40	4.20	16.70
8	27.40	57.00	15.40	1.10	-	1.50	1.80	3.30	4.00	2.20	13.60
Total	27.60	37.43	27.70	1.90	1.18	1.80	3.61	3.10	6.68	2.90	14.70

Table 5.4 Size distribution of land holding in Mezhuveli panchayat

Sl.No.	Size	Number of Farmers	Percentage
01	Marginal cultivators	3455	95.71
02	Small-scale cultivators (1 to 2 hectares)	137	3.79
03	Large-scale cultivators (above 2 hectares)	18	0.50
	Total	3610	100.00

Table 5.5 Farming committees in Mezhuveli panchayat

Name of Farming Committee	No. of farmers	Wards	Crop Type	Amount of seeds Kg/Hec.
Punnakkulanji Charuvelippadi	51	I	Jyothi	80
Eramallil-Pera	45	IV, VII	Jyothi, Pavizhum	80
Neppikkal	32	VII	Pavizhum	80
Thevaramkulam Karamuttam	35	III	Jyothi	80
Ratrakode-Peedikappadi	28	II	Jyothi	80

Road network

The panchayat is served by a well-developed road network (Fig. 5.2). Considering both metalled and unmetalled roads, the road density works out to 6.5 km/sq.km. The State highway passes through the eastern part of the panchayat. There are seven major road junctions, around which most of the facilities are concentrated.

In order to assess level of accessibility, another map (Fig. 5.3) has been prepared showing the accessibility zone up to 500 metres from the metalled road. It emerges that only few pockets are left beyond 500m distance.

Distribution of schools

There are six lower primary schools (LPS), two upper primary schools (UPS), and one high school (HS) in the panchayat (Fig. 5.4). The total number of students enrolled in the different grades of schools and teachers are given in Table 5.6.

Teacher student ratio is less than 25. Distribution of students in each class covering all Lower Primary Schools, Upper Primary Schools, and High Schools are provided in the Figs. 5.5, 5.6, and 5.7.

Interaction zones of all these schools have been worked out based on the distance parameter. The primary aim is to bring out how much distance a student has to cover to avail schooling facilities. For each type of schools ie LPS, UPS, and HS interaction zones have been worked out (Figs. 5.8, 5.9, and 5.10). It emerges from the analysis that LPS students living in 65 per cent of the total panchayat area have school facilities within one km of their residences. Similarly, 66 per cent of area served by UPS comes between 1-2 km distance. So far as high school is concerned, people living within 75 per cent of area enjoy high school facilities by travelling a distance not more than two km (Table 5.7).

Locational analysis of school

This exercise is taken up to assess the position of the schools with respect to population distribution. The panchayat has eight wards. Geographical centres of the wards have been identified. It is assumed that the geographical centres are the centres of population concentration also. Distance of the nearest school from each ward centre is given in Table 5.8. It may be noted that ward III and ward IV have two schools each and ward V does not have any school. The Government High School is located in ward IV. The LPS and the HS in this ward are most optimally located as their distance from the ward centre is the minimum.

Table 5.7 Interaction zones (area) of LPS, UPS, and HS in Mezhuveli panchayat

Sl. No.	School	Area <= 1km	Sq.km 1-2km	> 2km	Area (%) <= 1km	1-2km	> 2km
01	LP School	9.4	5.0	-	65.3	34.7	-
02	UP School	4.6	9.8	-	34.4	65.6	-
03	High School	2.7	8.1	3.6	19.0	56.0	25.0

Table 5.8 Distance from the school to nearest ward centre in Mezhuveli panchayat

Sl. No.	Name of School	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8
1	MSC.LPS	1.60	-	-	-	-	-	-	-
2	SNV LPS	-	0.65	-	-	-	-	-	-
3	GV LPS	-	-	-	0.18	-	-	-	-
4	P.HS	-	-	-	0.10	-	-	-	-
5	GOVT. LPS	-	-	0.55	-	-	-	-	-
6	GIS LPS	-	-	0.60	-	-	-	-	-
7	ST. JOHN'S MSC.LPS	-	-	-	-	-	0.50	-	-
8	SMS.LPS	-	-	-	-	-	-	-	1.03
9	SA. LPS	-	-	-	-	-	-	0.60	-

Health care

Health care facilities are available through four institutions, namely, one primary health centre, one homoeo hospital, one ayurvedic hospital, and Holy Christ hospital. Apart from these, three sub-centres function for family welfare at the ward level.

The above mentioned four institutions serve Mezhuveli and adjoining panchayats (Table 5.9).

Table 5.9 Health care facilities in Mezhuveli panchayat

Name of the Hospital	Out patients treated (Daily average)	Staff Members		Service area	Remarks
		Doctors	Others		
Primary Health Centre	42	1	15	Mezhuveli Kulanada Mulakuzha	Govt. No bed facility
Holy Christ Hospital	55	1	8	Mezhuveli Cheneerkara Aranmula	Private Beded Hospital
Govt. Homoeopathic Hospital	56	1	3	Mezhuveli	No bed facility
Govt. Ayurveda Dispensary	40	1	3	Mezhuveli Kulanada Aranmula Cheneerkara	No bed facility Patients above 50 years

Spatial distribution of these four centres and the interaction zone (Fig. 5.11) indicate that there are gaps, particularly in the northern part.

Around 45 per cent of the panchayat area lies within the 1 km distance zone from the hospital, 39 per cent within one to two km, and only 16 per cent beyond two km. Like education, the panchayat is well served with health care facilities. It is the patients of relatively old age groups who visit Ayurvedic and Homoeo hospitals.

Locational analysis

In order to assess location of the hospitals with respect to ward centres, a distance matrix has been worked out (Table 5.10). The PH centre lies very near to the geographical centre of the ward I. The Homoeo hospital is located in ward IV. The Holy Christ Hospital is located just

250 meters away from the geographical centre of the ward VII. Inter-hospital distances have also been worked out (Table 5.11) The maximum distance, 4.8 km is found between the PH Centre and the Holy Christ Hospital, both offering the Allopathic system of treatment.

Table 5.10 Distance between hospitals and ward centres (in km) in Mezhuveli panchayat

Sl. No.	Name of Hospitals	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8
01	PH Centre	0.4	2.1	3.8	2.4	4.2	3.4	4.7	5.2
02	Homeo Hospital	2.3	2.2	2.1	0.3	1.7	1.5	2.4	2.6
03	Ayurvedic Hospital	3.3	3.3	2.8	1.4	1.5	0.8	1.4	1.9
04	Holy Christ Hospital	4.5	4.6	3.8	2.7	2.8	1.5	0.3	1.7

Table 5.11 Inter-hospital distances (in km) in Mezhuveli panchayat

Sl. No.	Name of Hospitals	Name of Hospitals				Nearest Hospital
		PHC	Homeo Hospital	Ayurvedic Hospital	Holy Christ Hospital	
01	PH Centre	0	2.7	3.5	4.8	2
02	Homoeo hospital	2.7	0	1.1	2.4	3
03	Ayurvedic hospital	3.5	1.1	0	1.4	2
04	Holy Christ Hospital	4.8	2.4	1.4	0	3

Functional analysis of nodes

Owing to dispersed and linear nature of the settlement pattern, the villages of Kerala are quite different from their counterparts elsewhere in India. While, in rest of India, functional hierarchies are marked from a hamlet to a city, in case of Kerala, the pattern takes a different form. Usually the road junctions here serve as nodes where most of the amenities are concentrated.

There are seven road junctions in Mezhuveli panchayat. Most of the amenities available in the panchayat are concentrated in each of these road junctions (Fig. 5.12 and 5.13).

Elavumthitta junction is the major centre of activities. By awarding scores for each of the amenities, the total functional score has been worked out for all the seven junctions (Fig. 5.14)

It is noteworthy that though Mezhuveli junction lies in the heart of the panchayat, the amenities are concentrated more in Elavumthitta junction which is located in its eastern part. Certainly this node also caters to the needs of adjoining panchayats. Inter-panchayat accessibility acts as the main force underlying this concentration.

Suitable area for settlements

Concentration of amenities, road network, and distribution of population are interrelated. Once a settlement develops, other facilities follow and once amenities are available people are attracted to the area for settlement.

In Mezhuveli panchayat, like in the rest of the State, settlement distribution is primarily controlled by physiography. The lateritic ridges and upper slopes are given for linear pattern of settlement. Road layout and distribution of amenities also follow the same trend. However, recent developments indicate a tendency for the spreading of settlement over the lowland area to avail of the proximity to amenities.

Figure 5.15 highlights the distribution of areas suitable for settlements and ward boundaries, the relationship between suitable area for settlement, population concentration, and household development.

Correlating the area suitable for settlements with total population distribution, it is found that the relationship is high ($r=0.786$). But population density is not related to area (Table 5.12). In all probability, density variation may be considered as a response to availability of amenities, whereas the total population size is a manifestation of availability of habitable areas.

Table 5.12 Rank correlation between selected demographic variables, Mezhuveli panchayat

Sl. No.	Variables	Rank Correlation Value
01	Suitable Area of Settlement & Population	0.79
02	Suitable Area of Settlement & Number of Households	0.79
03	Suitable Area of Settlement & Population Density	- 0.10
04	Suitable Area of Settlement & Household Density.	- 0.26

Watershed-based development

Watershed-based development forms part of spatial planning in which area development is conceived in terms of micro watersheds. The Mezhuveli panchayat is located at the inter-fluve of Pamba and Achankovil rivers. Hence the watersheds of the panchayat are the sub-systems of these two major river basins, the Pamba watershed and the Achankovil watershed. The majority of the area of the panchayat drains to the Pamba river system in the north and the remaining part flows southwards to the Achankovil river system.

Watershed demarcation

Due to its location in the midland zone of the State, watershed demarcation in Mezhuveli panchayat is not so complicated as the region has appreciable relief. Two tributaries of Pamba ie Kozhithodu and Perurthodu drain most parts of the panchayat.

Table 5.13 Distribution of area under various land units at micro watershed level, Mezhuveli

Land units	Area under micro watersheds (sq.km)									Total
	P1	P2	P3	P4	P5	P6	A1	A2	A3	
Crests (T1& T2)	0.03	0.01	0.1	0.04	0.36	0.25	0.15	0.02	0.21	1.17
Steep Slopes (S4 & S3)	0.06	0.00	0.03	0.14	0.50	0.48	0.33	0.16	0.23	1.93
Moderate to gentle slopes (S2 & S1)										
Foot slope (FS)	0.42	0.22	0.70	1.39	1.23	0.34	0.62	0.06	1.39	6.37
Valleys V1	0.07	0.17	0.42	1.29	0.88	0.56	0.79	0.15	0.64	4.97
Total	0.58	0.41	1.25	2.86	2.97	1.63	1.89	0.39	2.47	14.44

Considering the drainage condition and the rivers to which the streams flow, the panchayat is divided into two micro watershed groups - Pamba and Achenkovil (Fig. 5.16). There are six micro watersheds under Pamba (P) group and three under Achenkovil (A) group.

Watershed characteristics

The micro watersheds of Pamba are relatively large compared to those under Achankovil micro watersheds. The six micro watersheds of Pamba together cover an area of 9.96 sq.km or 67 per cent of the total area, of which 4.30 sq.km falls under moderate to gentle slopes. Table 5.13 provides a brief description of the area under different land types in these micro watersheds. The Pamba micro watersheds have altogether about 3.40 sq.km area under valley floor. The steep slopes and crests constitute only 13 per cent of the total area. The

soils found in these watersheds are alluvium and laterite. The micro watersheds of Achenkovil cover only 33 per cent of the total area. The greater part of the area is under moderate to gentle slopes (2.07 sq.km) and the valley floor (1.57 sq.km). The land use pattern in these watersheds is dominated by agriculture. Rubber is the major crop followed by mixed crops. The mixed category includes, mostly, coconut, arecanut, and fruit trees. Paddy is cultivated in the valley floor. Table 5.14 gives the details of the watershed-wise distribution of area under various landuse types.

Table 5.14 Area under various landuses at the micro watershed level in Mezhuveli panchayat

Landuse type	Area under micro watersheds (sq.km)									Total
	P1	P2	P3	P4	P5	P6	A1	A2	A3	
Paddy	-	0.01	0.03	0.64	0.40	0.34	0.12	-	0.18	1.7
Mixed crops	0.11	0.11	0.40	0.80	1.08	0.65	0.84	0.10	1.04	5.13
Coconut	0.03	0.02	0.02	0.01	0.04	0.04	0.01	-	-	0.17
Rubber	0.41	0.25	0.76	1.39	1.37	0.53	0.89	0.29	1.20	7.09
Cashew	0.02	-	0.02	-	0.08	0.07	-	-	-	0.19
Wastelands	0.01	0.01	0.02	-	-	-	0.03	-	0.05	0.14
Total area	0.58	0.40	1.25	2.86	2.97	1.63	1.89	0.39	2.47	14.44

Correlating landuse and landform, we find that about 275 ha. of the paddy fields have been reclaimed for other agricultural and non-agricultural uses. The available valley floor is not well-utilised for paddy cultivation. The intensity of this phenomenon is more in P1 and A2 where though 0.21 sq.km is available as valley floor, paddy is not cultivated at all. The paddy fields in the micro watersheds are being shifted to tapioca, plantains, and betel. Table 5.15 indicates the extent to which the areas under paddy cultivation is already lost. The area under paddy cultivation has been reduced by 55 per cent. There is a 0.14 sq. km area under wastelands marked mainly in the lateritic crests. Cashew is also cultivated here mainly in the steep to gentle slopes. Distribution of ponds, springs, and wells have been computed for each micro watershed (Table 5.16). The Table provides an idea of water availability at the micro watershed level. This background information is required for designing watershed management programmes. It may be noted that P3 micro watershed is characterised by all-season wells. Conversely, P6 micro watershed has high water potentiality and the wells are all perennial. To assess population pressure at the micro watershed level, density of population and density of households in each micro watershed have been worked out (Table 5.17).

Table 5.15 Change in area under paddy cultivation (1968-1991) in Mezhuveli panchayat

Landuse type	Area under micro watershed (sq.km)									Total area
	P1	P2	P3	P4	P5	P6	A1	A2	A3	
Available valley floor (1968)	0.07	0.18	0.45	1.24	0.90	0.56	0.79	0.14	0.64	4.97
Existing paddy cultivation (1991)	-	0.01	0.03	0.64	0.40	0.34	0.12	-	0.48	1.72
Change	-0.07	-.017	-0.42	-0.60	-0.50	-0.22	-.67	-0.14	-0.46	-2.75

Table 5.16 Water structure and distribution at micro watershed level in Mezhuveli panchayat

Water structure	Watershed									Total
	P1	P2	P3	P4	P5	P6	A1	A2	A3	
Ponds										
Perennial	5	2	2	2	2	5	5	-	4	27
Seasonal	2	1	2	2	2	4	4	-	3	20
Total	7	3	4	4	6	9	9	-	7	47
Spring	2	1	1	4	3	7	7	-	1	23
Wells										
Perennial	1	9	-	445	474	235	298	16	559	2037
Seasonal	112	51	192	12	15	-	66	-	-	448
Total	113	60	192	457	489	235	364	16	559	2485

Table 5.17 Distribution of population in the micro watersheds of Mezhuveli panchayat

Watershed	Area (sq.km.)	Population		Households	
		Total	Density (person/ sq.km)	Total	Density (Nos/ sq.km).
P1	0.58	658	1134	147	253
P2	0.41	611	1490	136	332
P3	1.25	1444	1155	320	256
P4	2.86	3082	1079	685	240
P5	2.97	2238	754	511	172
P6	1.63	1240	761	281	172
A1	1.89	2141	1133	473	250
A2	0.39	282	723	65	167
A3	2.47	2420	980	555	225
Total	14.44	14121	978	3173	220

Micro watershed P1

This micro watershed covers an area of 0.58 sq.km of which 0.07 sq.km is valley floor. The major landuse in this area is rubber which covers 0.41 sq.km. Paddy is not cultivated here. Tapioca, plantains, and betel dominate the lowland agriculture. About 0.01 sq.km area is found to be wastelands. This micro-watershed has a total population of 558 persons. Water shortage is the major problem.

Micro watershed P2

This micro watershed at Perurthode, located in the north western part of the panchayat covers 0.40 sq.km of area. It has 0.18 sq.km of low lands but paddy is cultivated only in 0.01 sq.km; 0.17 sq.km of land has been lost to mixed crops, plantains, vegetables, and tapioca. Rubber is the major crop and occupies 0.25 sq.km. Population density (1990/ sq.km) is found to be the highest in this micro watershed. It is also affected by water shortage.

Micro watershed P3

This micro watershed having an area of 1.25 sq.km drains north of Kozhithodu and is known as Karakkad micro watershed. Moderate to gentle slope covering 56 per cent of the area dominates the landform followed by valleys (36 per cent). Rubber is the major crop. Paddy covers only 0.03 sq.km area. Water availability is moderate to high. The major problem of this area is water shortage. All the 192 wells marked in this watershed are non-perennial. Dug wells get dried up in early summer. There are 320 households inhabited by 1,444 persons. Density of population is 1,155 persons per sq.km.

Micro watershed P4

This is one of the major micro watersheds in the panchayat. It covers an area of 2.86 sq.km and has a total population of 3,087 persons. It is dominated by moderate to gentle slopes followed by valleys. About 1.24 sq.km is under valleys. Rubber is the dominant crop. About 48 per cent of the paddyfields has been reclaimed for railways, and for plantain, tapioca, and vegetables cultivation. About two hectares of wastelands are partly in the valleys and are waterlogged due to the leakage of Pamba Irrigation Canal. There are about 457 wells of which 445 are perennial.

Micro watershed P5

This is also one of the major micro watersheds of the area and has been divided into three sub units. About 41 per cent of the area is under moderate to gentle slopes and 30 per cent is under valley lands. Rubber and mixed crops dominate the landuse pattern. Paddy is cultivated in 0.04 sq.km area. It is estimated that about 0.50 sq.km area has been shifted to other uses. The total population of the micro watershed is 2,238. The major problem is waterlogging due to leakage of Pamba canal.

Micro watershed P6

This micro watershed located at the north-eastern part of the panchayat covers an area of 1.63 sq.km and has a population of 1,240 persons. Landform here is dominated by valley floor which covers about 0.56 sq.km. The steep slopes and crest together covers an area of 0.73 sq.km. The problems of this watershed are soil erosion and lack of irrigation facilities. Mixed crop is the dominant landuse. Paddy is cultivated only in 0.3 sq.km. About 0.22 sq.km area under paddy has been shifted to other crops. Cashew is raised in relatively dry parts of this area.

Micro watershed A1

This watershed slopes southward to Achenkovil river and has two sub units. It is located in the south western part of the panchayat and covers an area of 1.89 sq.km of which 0.79 sq.km is under valley. Rubber dominates the agricultural practices, followed by mixed crops. Paddy is cultivated in only 0.12 sq.km. The main problems are water shortage, lack of irrigation, land conversion, and low productivity of coconut and paddy. This micro watershed is named Kiriyanipalli watershed. It has a population of 2,141 persons.

Micro watershed A2

This is the smallest micro watershed in the panchayat covering only two per cent of the total geographical area. Steep slopes dominate the landform type followed by valley floor (0.14 sq.km). Only rubber and mixed crops are cultivated. Paddy cultivation is totally absent and hence it can be estimated that, in 30 years there has been a loss of 0.14 sq.km of paddy fields. The watershed has a total population of 282 persons.

Micro watershed A3

This is the major southerly draining micro watershed in the panchayat and is named Elavumthitta micro watershed. It covers an area of 2.47 sq.km with a total population of 2,420 persons. The landscape is dominated by moderate to gentle slopes. Rubber is the dominant crop followed by mixed crops.

There is only 0.18 sq.km area under paddy cultivation. Tapioca is an important crop. This watershed has about 559 perennial wells and the well density is 226 wells/sq.km. An area of 0.05 sq.km is wasteland.

Observation

The data analysis for spatial planning covering amenities and watershed management highlights the following points with respect to PRM:

(i) The PRM maps provide massive data highly useful for Plan preparation;

(ii) Additional data especially data on productivity, amenities, services, etc are required to conduct a meaningful exercise on planning;

(iii) There are enough reasons, specially in view of the limitations of the data generated and of additional data requirement, to conceive of PRM in a larger framework which would encompass other planning aspects also;

(iv) It is not possible for the panchayats to take up these exercises without proper support;

(v) Watershed-based programmes could be well formulated and integrated within the framework of the panchayat-level planning; and

(vi) At present, PRM data have not been used to the full extent. Resource maps alone do not fulfil the entire data requirements for planning.

6. Relevance of PRM in Future Panchayat Planning

In this section, we intend to discuss the prospects of panchayat planning and relevance of PRM exercise. Other issues, which have direct bearing on panchayat planning, will also be examined.

Perspective Plan preparation

With initiation of the people's participatory planning process, the State has taken a decisive step to awaken the local aspirations and needs to be fulfilled with the available resources. Only a few panchayats, where PRM has been completed, has detailed information on the resources locally available.

Preparation of medium and long-term Plans for, say three years, five years, and 10 years respectively, is required together with preparation of annual Plans. Annual Plans should not stand as isolated activities, but should be incorporated into longer term Plans. Panchayats have to depend more and more on local resources and concentrate on productivity enhancement. Towards this, perhaps the first step is total resource assessment .

During the course of perspective Plan preparation, activities at different levels ie Grama Sabha, panchayat, block, district and even State, could be clearly identified as the decentralised process actually operates through multi-level planning. The basic requirements for perspective planning are the following:

(i) Data base: Detailed resource information at the lowest levels such as the individual and the household about all environmental and economic resources and assessment of

their present state of utilisation;

(ii) Prioritisation of activities and time scheduling (A tentative list of activities for different phase is given in the Table 6.1);

(iii) Monitoring of change: Documentation of the processes, their achievements and shortcomings as well as the repercussions of intervention and improvement in the living conditions.

Table 6.1 Intervention programme for perspective Plan

	Short term (within 1 to 2 years)
1.	Pond rejuvenation for water harvesting, minor irrigation and inland fisheries
2.	Drinking water and sanitation
3.	Biological soil conservation
4.	Infiltration gallery, terracing
5.	Reactivating drainage canals/channels
6.	Introduction of vegetable cultivation on experimental basis
7.	Road repairing
8.	School building and public property maintenance
9.	Afforestation and pond catchment management
10.	Pasture and grassland development
	Medium term (2 to 5 years)
1.	Pisci culture
2.	Sericulture
3.	Poultry and animal husbandry as household units
4.	Health Care and sanitation
5.	Road construction
6.	Minor irrigation
7.	School education - Removing illiteracy of the literates
8.	Vegetable cultivation as rotational crop
9.	Micro watershed management
	Long term (5 years and above)
1.	Increasing land productivity using Bio-fertiliser
2.	Irrigation
3.	Small scale industry
4.	Higher educational facilities
5.	Marketing network
6.	Drinking water scheme
7.	Sanitation scheme
8.	Watershed management

(iv) Hierarchical Plan consolidation: Consolidation of plans at different levels; from Grama Sabha to panchayat, block, district and finally to the State level. Forward and backward linkages of activities are to be strengthened.

(v) Compatibility and Complementarity: Plans emerging from the bottom have to be made compatible to those emanating from the top and vice versa. Plans of different panchayats should be complementary to one another. Inter-panchayat linkage is one of the issues that calls for proper attention.

(vi) Flexibility: As societal perception changes from time to time, a perspective plan should have enough flexibility to accommodate changes.

(vii) Long-term vision: Planning is a combination of art, science, and philosophy. Societal goal for future has to be properly visualised and activities need to be co-ordinated accordingly. It should always look beyond day-to-day operations.

(viii) Self reliance: Self reliance of the panchayat is perhaps the foremost objective of Panchayati Raj. The perspective Plan must be oriented towards this goal. It should address the extent to which a panchayat could be made self-reliant and the means and methods of designing the required intervention programmes.

Need for science and technology input

The scope of horizontal expansion of the resource base is severely limited. However, there is enough potential for quality and productivity enhancement, so that availability of total resources could be increased.

This is possible only when detailed information on resource base is available. Application of science and technology is, in this context, extremely important.

Intervention plans with minimum injury to the environment could be worked out based on detailed disaggregated data at the lowest level. The ways in which the physical system responds to interventions need to be investigated in depth. Scientific and technological inputs in land, water, and biomass management should form important ingredients in panchayat Plans. With more and more emphasis on micro-level operation, quality and detailed information is essential to workout viable programmes.

Tremendous improvements in remote sensing technology, biotechnology, and information technology have opened new horizons for applying science and technology in local level development. The scope of resource assessment and monitoring, improvement in quality of biomass and information dissemination has taken a quantum jump in recent years. These opportunities can be properly utilised for future development.

Extending PRM programme

For effective implementation of perspective panchayat Plans, resource mapping programme

has to be pursued for all panchayats in right earnest. As noted earlier, the panchayats with PRM data are found to be in a better position than their counterparts without PRM data, in the preparation of their plans. However, PRM data have not been fully utilised due to lack of proper technical support on the one hand, and non-availability of supplementary data on the other.

PRM has to be extended to all panchayats. As has been suggested in many panchayat-level action plans, PRM should be one of the basic tasks of the panchayat. The following points deserve special attention in this respect:

(i) All panchayats may initiate their planning process after acquiring data through RM. PRM should be the responsibility of the panchayat.

(ii) PRM data, available at present, are not complete in many respects. Plot-level data of all the sectors are required for meaningful Plan preparation. PRM data acquisition methods may be suitably modified.

(iii) Together with resource mapping, collection of other relevant data should be taken up. Gradually, data collection should be co-ordinated in such a fashion that repetition is avoided and the basic data could be utilised by all the agencies concerned.

(iv) A technical support group has to be formed for helping the panchayats. Without proper support, it will be difficult for panchayats to prepare and execute Plans. Regular Government departments may not be equipped in this regard.

(v) Utilisation of PRM data must start immediately after completion of PRM. This certainly calls for capability-building of the local people.

(vi) PRM data may be synthesised at the block and the district levels and also at the watershed level as the watersheds are the operational units while panchayats/ blocks/districts are the delivery units.

(vii) While carrying out PRM, inter-panchayat dialogue is necessary. Block-level operation may be considered in this context. As panchayats and villages are not co-terminus, a single revenue map may sometimes be used by more than one panchayat. A group approach, therefore, may be helpful.

(viii) High resolution remote sensing data and cadastral level data should be assimilated wherever possible. This will open new ground for easy monitoring of landuse/ resource utilisation.

(ix) Modern technologies, such as High Resolution Remote Sensing, Geographical Information System (GIS) and high tech communication systems like Internet could be put to use in the carrying out of PRM.

(x) Kerala is yet to develop a proper data base. A data structure evolved from the plot-level would enhance the richness of data for planning. It may be noted here that apart from paddy and seasonal crops, the net area sown under crops is not reported under agricultural statistics.

(xi) As a new approach to planning has been introduced by PRM - to formulate Plans based on resource data - conscious effort is needed by technologists, administrators, planners, and resource managers to intensify this process and ensure that Plans are based on local resources including financial resources.

(xii) Personnel carrying out PRM should be conscious of the various issues involved in the programme - sociological, technical, and organisational.

PRM execution should be supervised by a single Science and Technology Institute, solely devoted to the work in order to maintain quality and comparability of data. People in the panchayats should be trained to take up this work. Like the literacy mission a PRM mission may be set up to undertake the task. It is possible to complete the first phase of PRM, namely mapping and data generation, within four years provided a decentralised zonal approach is followed.

Emergence of grassroot planners

The massive training programme undertaken for implementing the People's Plan Campaign has initiated the process of building up grassroots-level planners. One of the major problems encountered in planning from time to time is the lack of trained personnel who would do their job rubbing shoulders with the people in the village instead of shutting up themselves in offices either at the district or State headquarters.

The people from the panchayats who have received training are involved variously in stimulating discussion, explaining the programme and its possibilities, identifying problems, discovering the aspirations of the local people, orienting their attitudes towards development, and making them achievement-minded. Their aspirations should conform to their potentials and to the use of social, political, and administrative organisations engaged in developmental activities or help creating new organisations where required or possible. They should also be helped in the creation of new organisations wherever required.

The concept of 'Social Animator' or 'Bare Foot Planner' is akin to these people. They need to be nurtured to ensure further capability building. This is necessary because they should have technical knowledge necessary to make effective communication with experts/professionals and to interpret the views of the experts and professionals back to the local people.

The GRPs may be able to make general assessment of the potentials, problems, and opportunities for development available in the locality. With adequate exposure to social organisation and leadership, they should be able to become promoters of leadership within the community. Inter-linkages of political organisations, social organisations, and administration should also be promoted by them. Technological diffusion required from time to time for development of society has to take place through these groups. In fact, such groups with proper technical support will emerge as the mainstay for panchayat-level planning. Their initiative in technology use can be through implementation of PRM programme.

Institutionalisation

Institutionalisation of the planning process at the panchayat level is necessary for its sustenance and replicability. It is a common experience that well-intentioned programmes with immense potential collapse over time for lack of institutionalisation.

Even in the short span of five years during which PRM was implemented by CESS, PRM looked very much an official programme. Such a notion is not only detrimental but runs contrary to the philosophy of PRM programme as well.

Review of panchayat activities in West Bengal has brought out the fact that the interest of people wanes over the time and that the panchayats tend to acquire the characteristics of a government department.

To overcome this tendency, institutionalisation of the total process could be thought of as an alternative. Fortunately, with the People's Planning Campaign, the process of institutionalisation has begun in Kerala. This process could be strengthened through various measures, such as the following:

Formation of Neighbourhood Groups

Informal arrangement or agreement among neighbours to pursue a specific activity can be the beginning of such an initiative. Families within these groups could interact at different levels and depend mutually in various activities.

Users' groups

Actual users of different resources may form groups or associations for proper management. Use of minor irrigation systems, ponds, springs, etc could be successfully done through these groups. Some orientation programme to equip them for resource identification and management will be of help.

Women's groups

Women's groups are found effective agencies for resource management. There are instances where forest resources and water resources are successfully managed for sustainable yield by women's groups.

Self -help groups

These groups may be formed to ensure mutual help among families for pursuing economic activities. These groups may be nurtured to take increasing responsibility and contribute to panchayat planning and Plan implementation.

Activisation of Krishi Bhavan

There is a Krishi Bhavan in each panchayat. At present, its function is limited to agro-related

administration. Krishi Bhavan may be revamped to make them the technical support centres for the panchayats. Integration of other sectors with the activities of the Krishi Bhavan will help develop a solid technical support base for the panchayats. Major changes in policy may be required to achieve this goal. However, since the infrastructure is already available, the suggestion has a very good chance of success.

Involvement of voluntary organisations

Involvement of voluntary organisations is crucial during the initial phase of programme implementation. However, over the time, it should gradually become less and less crucial. Unless conscious efforts are taken, dependency on voluntary agencies will persist. As has been observed in many instances voluntary agencies would tend to present the programme as their own. In effect, voluntary agencies come to be viewed as an alternative to government.

As the panchayats are active and have already taken the initial step, the prime objective of all concerned should be to empower them, enhance their capability and help the process of institutionalisation.

Panchayat Development Society

To involve people cutting across political, social, and economic differences, a Panchayat Development Society may be formed within the framework of the panchayat. This agency should also include representatives of voluntary agencies, local technical persons, local senior citizens and group leaders. Such a society may be able to play a major role in the process of institutionalisation.

7. Conclusion

In the present study, an attempt has been made to understand the process of translating Panchayat Resource Mapping programme (PRM) to Panchayat Level Planning (PLP) in Kerala. The study has incorporated the ongoing People's Planning Campaign in the panchayats in the State.

The issues which emerged and their implications are summarised here:

(i) Panchayat Resource Mapping programme has introduced a new dimension to local level, resource-based Plan formulation;

(ii) PRM has given confidence to people to participate in scientific and technical activities and the information generated by them are found extremely useful;

(iii) This is a big step towards empowerment. Literacy empowers the individual, but resource mapping empowers the society;

(iv) However, as technical skills are involved, adequate preparatory work on the part of the panchayat is essential. There have been a number of instances in which PRM could not be completed due to lack of proper ground preparation;

(v) A technical support group, preferably in the vicinity of the Krishi Bhavan, needs to be developed to conduct not only PRM, but the planning exercise as well;

(vi) The methods and techniques of spatial planning and the philosophy of PRM are to be disseminated fully among the local population;

(vi) PRM data are not adequate for total Plan preparation; collection of supplementary data is needed. A comprehensive data bank may be developed at the panchayat level for this purpose. Data at the extreme micro level, of the individual plots should be prepared;

(vii) All modern scientific and technological advancements, like high resolution remote sensing, geographical information system and information technology, should be used with direct people's involvement in resource survey, management, and development;

(viii) Voluntary agencies should help the process at the initial stages, but over the time, their role should become progressively smaller. However, they should keep track of the developments taking place in the panchayat and safeguard the panchayat from turning into the conventional type of a government agency.

(ix) Development programmes may be worked out on the basis of micro watershed. Such an exercise would not only help address the issues rationally since watersheds are not only natural units, but they also provide a framework for hierarchical data consolidation. Gradually, the panchayat boundaries have to be approximated to the natural boundaries, for which watersheds are useful.

(x) Traditional skill upgradation should be given importance while panchayat planning is undertaken.

(xi) Neighbourhood groups, self-help groups, users' groups, and similar other groups may be encouraged to take up the PRM programme under the aegis of panchayat. This will ensure continuous people's participation and keep alive the excitement of creativity.

(xii) A Panchayat Development Society involving people cutting across political, social, and economic frontiers and involving voluntary agencies, local technical personnel, panchayat elders and other knowledgeable groups may be formed within the frame work of panchayat.

(xiii) Institutes and line departments may be specifically directed to co-operate with the panchayat and also adopt panchayat for total development.

(xiv) A vibrant panchayat system acting as the nodal agency with assistance from voluntary agency or people's science groups and a committed technical support group, could be the ideal set-up. Krishi Bhavan, if properly reorganised, could form the most appropriate nodal agency for executing PRM and preparation of panchayat Plan.

(xv) Effective people's participation may be ensured only through panchayats. Despite their shortcomings, panchayats are the best option to venture into local-level development. All efforts should be directed to make the panchayat capable and efficient.

Appendix I

Participatory Resource Mapping (PRM) Programme

Training Curriculum (Duration: 3 days)

Objectives

(i) To equip the participants in conducting and guiding the PRM;
(ii) To build up capability of the local people; and
(iii) To help the participants in developing local resource use plan (LURP) through the PRM.

Module I: Concept of PRM programme

I.1	Changing perspectives in planning - integrated, decentralised, and spatial approach
I.2	Local resource-based planning
I.3	Environmental perspectives: equity, sustainability, and economic viability
I.4	People's Planning - a continuing education
I.5	Interaction/group discussion

Module II: The PRM Programme - A new planning approach

II.1	Participatory rural appraisal - an overview
II.2	The PRM approach - stages of activities
II.3	PRM to people's planning
II.4	Interaction / group discussion

Module III: Resource Mapping

III.1 Types of maps, scale, legend, mapping requirements and mapping parameters
III.2 Mapping techniques: landuse, land types, amenities, and water resources
III.3 Use of data formats
III.4 Interaction / group discussion

Module IV: Pre-field preparation

IV.1	Familiarisation of maps and data formats
IV.2	Group selection
IV.3	Mapping exercise
IV.4	Social mapping
IV.5	Interaction / group discussion

Module V: Field mapping

V.1	Transect walk
V.2	Resource Mapping
V.3	Data gathering
V.4	Replotting
V.5	Interaction / group discussion

Module VI : Post-mapping phase

VI.1	Finalisation of maps
VI.2	Data assimilation
VI.3	Environmental evaluation
VI.4	Interaction / group discussion

Module VII : Resource Mapping to People's Planning

VII.1	Map communication / dialogue
VII.2	Integration of qualitative and quantitative data
VII.3	Formation of Users' group
VII.4	Formulation of action statement and prioritisation
VII.5	Finalisation of action plans
VII.6	Modalities of implementation
VII.7	Monitoring and evaluation

Module VIII: Simulation Exercise

VIII.1	Use of map for action planning
VIII.2	Integrated resource use plan
VIII.3	Group exercise

Items Required for Conducting PRM

(For One Survey Team)

1.	Enlarged copy of maps	4 sets
2.	Base board / clip board	2 Nos.
3.	Colour pencil set	1 No.
4.	Measuring tape (tailoring)	1 No.
5.	Wood pencil (HB)	2 Nos.
6.	Eraser	2 Nos.
7.	Dairy	2 Nos.
8.	Data format	2 sets
9.	Scale (15 cm)	1 No.
10.	Nylon rope (15 m long)	1 No.
11.	Compass (if available)	1 No.

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