

Asia Forest Network

# PARTICIPATORY RURAL APPRAISAL FOR COMMUNITY FOREST MANAGEMENT

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TOOLS AND TECHNIQUES





The Asia Forest Network supports the role of communities in protection and sustainable use of natural forests. AFN is comprised of a select coalition of Asian planners, foresters, and scientists from government agencies, universities, and non-government organizations. Solidarity of AFN members is based on a common commitment to exploring alternative management strategies for Asia's natural forestlands. AFN's research emphasis includes the ecology of natural regeneration, the economics of non-timber forest product systems, and the community organizations and institutional arrangements that support participatory management. Lessons stemming from this research are used to inform field implementation procedures, reorient training, and guide policy reform.

We sincerely hope that this manual will be helpful to foresters, community leaders, NGOs, and others who are working to make natural resource management a collaborative and equitable process. Because there are numerous publications that describe participatory techniques, we have provided a reference list at the end of the manual.

This manual has been developed as an output of the Community Forest Management Support Project 2000 for Southeast Asia. The project has been generously funded by the European Commission and we are very appreciative for their support. We would also like to thank the following: Emily Bosanquet for compiling the information and writing up the manual; Kate Smith-Hanssen for her organizational help, editorial guidance, and layout assistance; Nancy Coburn for copy editing; Kristal Passy for binding the manual; and, Mark Poffenberger for contributing his expertise and guidance. We also want to express our appreciation for the many publications that came before us, providing us with useful illustrations and examples. Those references are included in the resource list at the end. The authors take full responsibility for any errors or omissions. The observations and opinions expressed in this publication are the author's and do not necessarily reflect any opinion whatever of the European Commission.

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# **PARTICIPATORY RURAL APPRAISAL FOR COMMUNITY FOREST MANAGEMENT**

**TOOLS AND TECHNIQUES**

**TABLE OF CONTENTS**

	Page
Participatory Rural Appraisal for Community Forest Management: Tools & Techniques	1
Who, Where, What, How, & Why	2
Section I: Dialogue Process	4
Semi-Structured Interviews	4
Group Discussion	4
Section II: Diagrams	5
Venn Diagram	5
Systems Diagram	6
Seasonal Calendar	7
Flow Diagram	8
Historical Transect	9
Trend Line	10
Section III: Table and Charts	11
List Making	11
Organizational Chart	12
Time Line	13
Ranking	14
Simple Ranking	14
Pair-Wise Ranking	15
Scoring	17
Section IV: Spatial Analysis	18
Community Sketch Mapping	18
Watershed/Sub-District Profiling	20
Participatory 3-Dimensional Modeling	22
Section V: Resource List	23

## **LIST OF FIGURES**

Figure 1	Example of a Venn Diagram
Figure 2	Example of a Systems Diagram
Figure 3	Example of a Seasonal Calendar of Forest Product Flows
Figure 4	Example of a Flow Diagram of Kotwalia Basket Production and Sale
Figure 5	Example of a Historical Transect, Gamtalao, India
Figure 6	Example of a Trend Line for Wood Extraction, Karnataka, India
Figure 7	Example of List Making
Figure 8	Example of an Organizational Chart
Figure 9	Example of a Time Line, Gamtalao, India
Figure 10	Example of a Simple Ranking Method of Common Forest Species by Use
Figure 11	Example of Recording Table for Pair-Wise Ranking
Figure 12	Example of Tree Scoring According to Five Criteria
Figure 13	Example of a Community Sketch Map, Kot-Kot Watershed, Cebu
Figure 14	Manual GIS Mapping Tools
Figure 15	Example of a Participatory 3-D Model

Participatory Rural Appraisal is a family of approaches and methods to enable local people to share, enhance, and analyse their knowledge of life and conditions, to plan, and to act.

-Robert Chambers

## **PARTICIPATORY RURAL APPRAISAL FOR COMMUNITY FOREST MANAGEMENT-TOOLS AND TECHNIQUES**

Participatory Rural Appraisal (PRA) tools facilitate collection and analysis of information by and for community members. PRA emphasizes local knowledge and involves communities in the inventorying, monitoring, and planning of local forest management. Because it is a collaborative process, PRA actively empowers marginalized communities, de-emphasizes hierarchies, and helps to identify resource needs and sustainable use systems. Each of the tools provided in this manual is based on PRA.

PRA methods serve multiple purposes. They provide information to outsiders who wish to understand how the community uses and manages its resources and they provide information for the collective community to evaluate its resource management practices. The process of collecting PRA information is as important as the data itself, as it triggers dialogues with the community, foresters, NGOs, and local government to examine existing resource use practices, problems, conflicts, and opportunities, providing a basis for developing more sustainable and productive management systems.

It is important that the facilitating PRA team take time to carefully prepare, developing a strategy for community discussions and a process to move from one step to the next. PRAs are often most successful if done in steps. After each exercise, the PRA facilitating team needs time to analyze the data that emerged and document the findings, while preparing for the next step. In this way information will not be lost in the process, but be used in developing a management plan for the area of concern.

This manual is a compilation of a variety of PRA tools and techniques. Deciding what tool or technique to use, depends a lot on the type of information you need. In other words, often the question that you are asking helps determine the process. The following section provides a brief summary of five types of questions you may want to consider when utilizing PRA techniques in order to get the information you need to develop a community forest management plan.

**WHO • WHERE • WHAT • HOW • WHY****☆ WHO ARE THE STAKEHOLDERS:  
IDENTIFYING PARTICIPANTS FOR RESOURCE MANAGEMENT DIALOGUES**

Identifying stakeholders allows us to know whom to invite to community meetings. It is important to incorporate all stakeholders when developing a management plan for the forest or water resources so that everybody's needs are identified and met. If all forest user groups are not accommodated by the management plan then the plan will be ultimately flawed. It is also important to recognize the relationship the stakeholders have with the forest/natural resource and the willingness of communities to become involved in a participatory management system or if they are involved, the degree to which they have committed resources.

**☆ WHERE IS THE MANAGEMENT AREA:  
TOOLS FOR SPATIAL ANALYSIS OF THE MANAGEMENT AREA**

Spatial Analysis allows us to focus our attention to the precise management area, its important resources, communities involved, and pressures within it. This process helps to identify user groups who have an interest in the area and eliminate non-user groups from the negotiation.

**☆ WHAT ARE THE CONSTRAINTS AND OPPORTUNITIES FOR IMPROVING THE PRODUCTIVITY  
OF THE FOREST: WAYS TO BETTER UNDERSTAND FOREST RESOURCE PRODUCTION**

Identifying constraints and opportunities for improving the productivity of a forest is important in many ways. This information will provide a basis in designing an economic analysis of the forest production system and identify opportunities for villagers to establish cooperative marketing systems. In collecting this information it is important to:

- \* Identify the forest products and their relative importance.
- \* Understand which of these products are used and/or sold.
- \* Understand the sources of these forest products.
- \* Understand the seasonal yields of the different forest products.
- \* Understand the steps involved in forest product collection, processing, and marketing, and the changes in prices that occur at each stage.
- \* Be able to calculate labor costs associated with the collection, processing and marketing of different forest products.
- \* Be able to calculate yield and value of these forest products (value does not necessarily mean a monetary amount. Value is indicated by villagers through the criteria that they use to score different forest products, (see *Ranking and Scoring*).
- \* Identify areas where the production system could be improved.
- \* Understand the current and historical trends of forest product availability.

☆ **HOW DO THE CURRENT RULES AND REGULATIONS GOVERN RESOURCE USE:  
LEARNING ABOUT EXISTING TRADITIONAL RESOURCE MANAGEMENT CONTROLS**

This question allows us to identify and resolve potential conflict between traditional and formal resource management controls in order to develop a more implementable management plan for the forest. Where systems of resource use and control do not exist, they may need further development in a new resource management plan.

Since controls are often tied to specific forest products, it may be helpful to discuss each product in terms of community access by asking the following questions during semi-structural interviews or mediated group discussion.

For each of the five to ten most important products, ask the following open-ended questions:

- \* Who can collect or harvest the product?
- \* When can it be collected? When is collection forbidden?
- \* Where can it be collected? Are there areas where collection is restricted?
- \* How much can be collected? Are there restrictions on volume?
- \* Are any technologies or methods of harvest or collection restricted or banned?
- \* Are fees assessed for collection?
- \* Are fines assessed for transgressions of collection rules? How much? Where do the fines go? How are they used?
- \* Who in the community or local government is in charge of monitoring local use of the resource? How are they appointed? Who are they responsible to?

☆ **WHY ARE THERE PROBLEMS AND WHAT ARE THE PRIORITIES:  
IDENTIFICATION OF RESOURCE MANAGEMENT PROBLEMS AND PRIORITIES**

List Making and Priority Rankings and Scoring are frequently used by PRA practitioners to identify management issues. Usually this takes place in group discussions (see p.4). Often, sub groups are formed to allow for age and gender differences to emerge. The group is asked to list the major resource management concerns for their area. Once a complete list has been compiled, the concerns are prioritized, either through Ranking (see p.14) and/or Scoring (see p.17 ). Once the list has been compiled, the community discussion group can discuss how to best address each issue.

## SECTION 1: DIALOGUE PROCESS

### SEMI-STRUCTURED INTERVIEWS

This technique involves obtaining valuable information through simply talking to individual community members or small groups. It is not limited to gaining stakeholder information but is used to better understanding the community's relationship and dependency on the forest resources, the management issues, and the available resources in addition to a whole range of additional information.

**Method:**

Prepare the topics for discussion and identify the individuals or groups you want to talk to. Select an appropriate time to conduct the interview. Ask open-ended questions that promote discussion and allow for flexibility in discussion so the issues that arise can be fully explored. At least one member of the PRA team should take notes. After the interview, the team should discuss the information and write-up a complete report.

### GROUP DISCUSSION

Group discussions with the community or multiple stakeholders allow us to explore a range of concerns and interests in the same way the semi-structural interviews do. The process of group discussions raises awareness of resource concerns and conflict and provides a platform to negotiate issues. The information that is gathered during the group meeting might help develop a management plan that is acceptable to all forest user groups.

**Method:**

Select an appropriate time and location where the meeting will not interrupt activities or be disturbed. Encourage the participation of a variety of forest user groups such that wide cross-section of information and opinions are involved. Promote techniques that encourage participation. Use open-ended questions to promote explanations and opinions. Agree on how the group meeting should be conducted but allow for flexibility in conversation so that issues can be explored as they arise. At least one member of the PRA team should take notes. After the group discussion, the team should discuss the information that was raised and write-up a complete report.

## SECTION 2: DIAGRAMS & LISTS

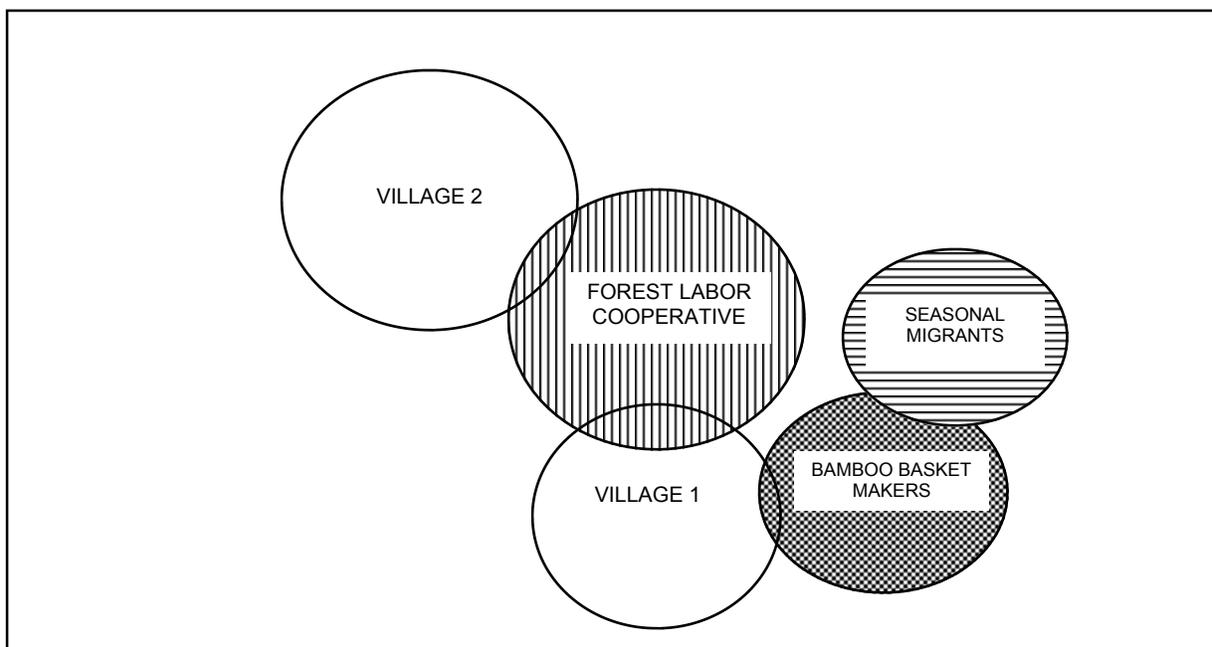
### VENN DIAGRAM

Venn Diagrams consist of circles drawn to indicate different user groups (overlap to reflect common membership). Identify leaders or contact representatives within the larger circles. Venn diagrams are useful in illustrating forest user groups and the relationship and reliance each group has with the forest and each other. They can help identify conflicts over resources as well as establish which village institutions might play a lead role in supporting a participatory management.

#### Method:

When developing a Venn Diagram it is useful to reflect the spatial arrangement of user groups on the ground. Define the settlements and represent them on the diagram. Define the user groups (e.g. mahua flower collectors, basket makers etc) and represent these. User groups will be reflected in a number of settlements. This will be reflected in overlapping circles on the Venn diagram. (see Figure 1)

**FIGURE 1: EXAMPLE OF A VENN DIAGRAM**



#### Analysis:

This example demonstrates that:

- \* Seasonal migrants and residents of Village 1 participate in bamboo basket making
- \* Village 1 and Village 2 are active in a forest labor co-operative

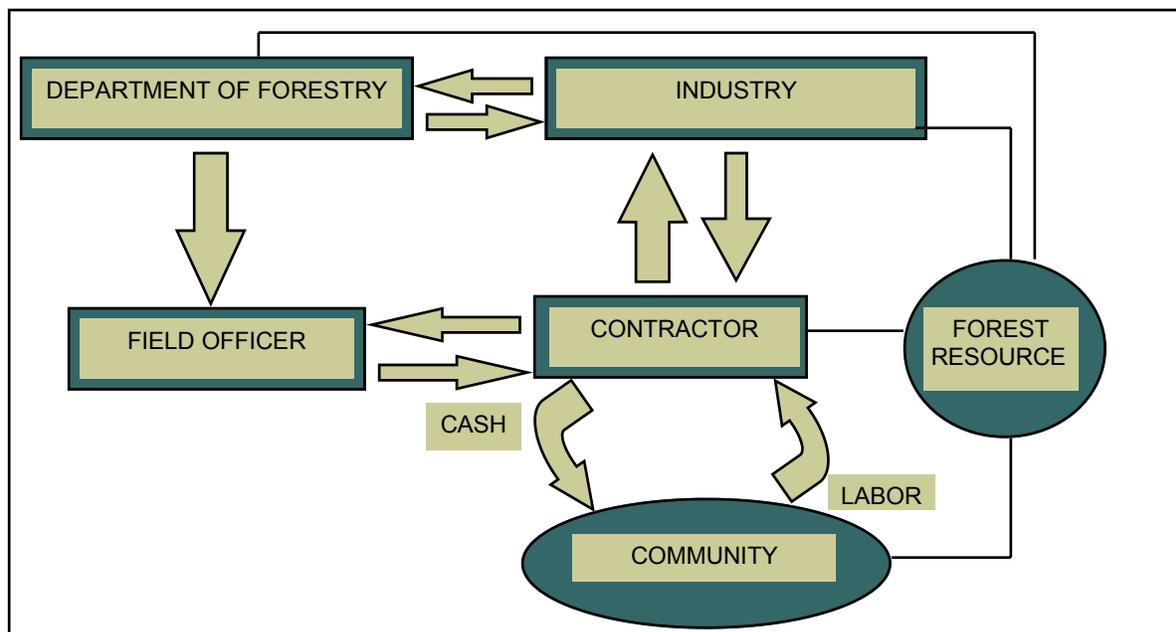
## SYSTEMS DIAGRAM

This technique is a way to illustrate the user groups, (including village communities, government field staff, commercial interests, NGO researchers) and the interaction between user groups and the resource.

### Method:

Information on user groups can be collected by using the semi-structural interviews of key informants and through group discussions. This information can then be diagrammed in a systematic way. (see Figure 2)

**FIGURE 2: EXAMPLE OF A SYSTEMS DIAGRAM**



### Analysis:

Arrows and lines indicate the various interactions between different user groups, and between user groups and the particular forest resource. This diagram represents a general example. More specific identification of the user groups (i.e. lumber industry) and forest resource under discussion (i.e. timber) would allow for an improved understanding of the interactions for a given area. From this diagram we can assess that:

- The community, contractor, industry, and department of forestry all interact directly with the forest resource.
- The field officer interacts with the forest resource through the contractor and the department of forestry.
- Industry has interactions with the department of forestry and contractors.
- The contractor has interactions with the community, paying the community for their labor.
- The community interacts with the forest service.

Semi-structured interviews with the forest user groups can help establish the types of interaction that are occurring and so bring more information to the management plan. Interactions may include fees or leases, (for example between industry and the department of forestry); a field officer overseeing the actions of the contractor with respect to the forest resource; and community members collecting forest resources for their own consumption or to sell.

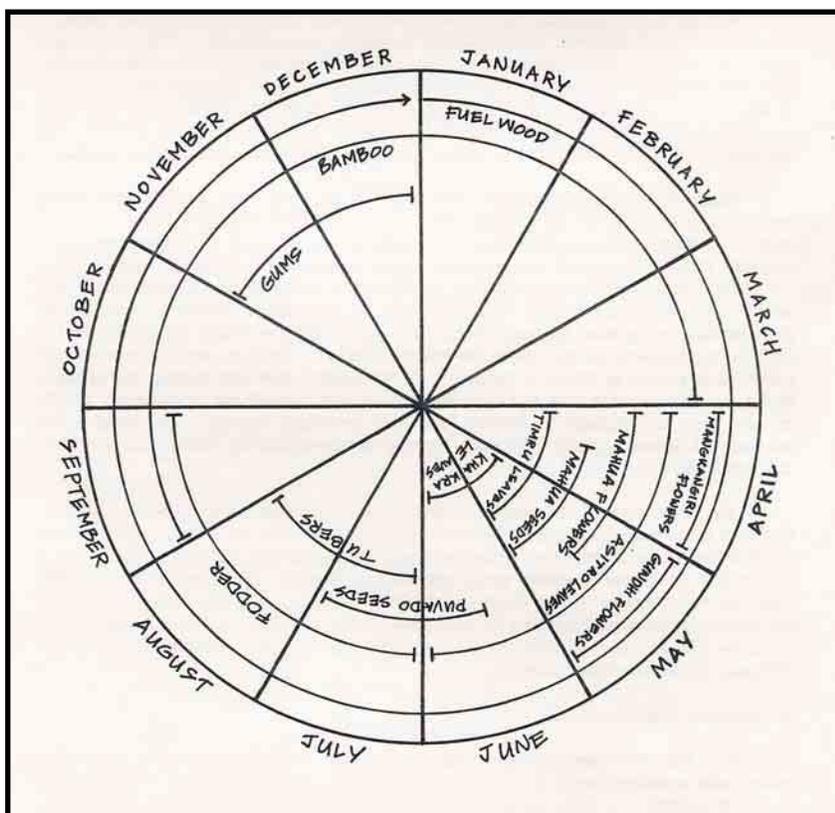
## SEASONAL CALENDAR

The seasonal calendar documents the flow of forest products over time and how product collection changes over the season. This information can contribute to an estimation of yields.

### Method:

The types of forest products will have been identified during the list making exercise. If many forest products have been identified it is best to limit the seasonal analysis to products that score highly for a given use, (i.e. three to five fodder products, fuel products etc). All products/species with commercial value, either sold in raw form or processed, should be included. First, the researcher should label 12 stones with the local name for each month and place these stones in a row on the ground. Selecting one product or type of product at a time for discussion, the researcher should ask the participating villagers to indicate which months each product is available. The villagers can use seeds to indicate relative availability; showing high and low yield periods. After each product or type of product has been indicated, the information should be photographed and transcribed onto paper. After recording, the next product or type can be discussed and laid out onto the ground calendar. The calendar can be effectively portrayed as a circle. Villagers can provide information showing the high and low periods for labor into agriculture, forestry, and other production systems that can also be represented on a similar type of seasonal calendar. Villagers can further indicate peak demand periods for different types of forest products like fodder, fuel, food and raw materials. (see Figure 3)

FIGURE 3: EXAMPLE OF A SEASONAL CALENDAR OF FOREST PRODUCT FLOWS



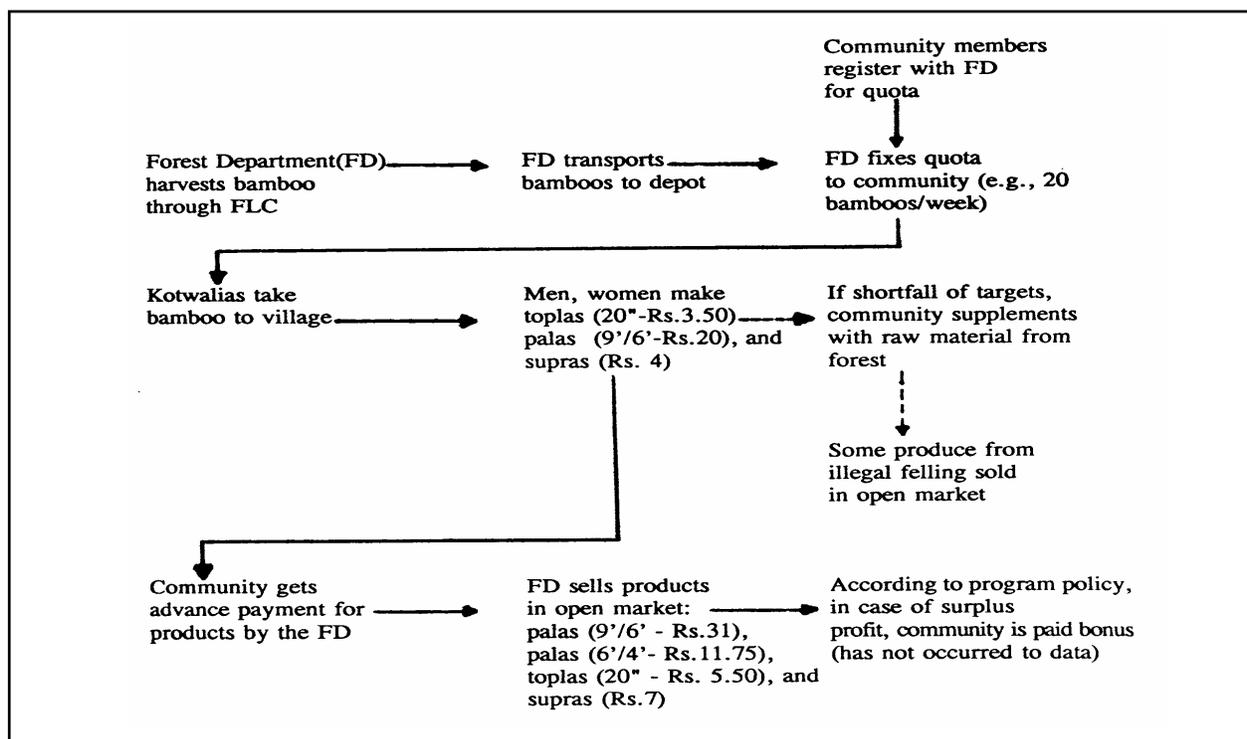
## FLOW DIAGRAM

This diagram technique is one of a range of tools that can be used to develop an economic assessment of the production system. This along with other economic techniques to estimate yields, labor and capital costs draw on information obtained from PRA tools but require additional research and ecological data before a rigorous economic analysis can be achieved.

### Method:

Semi-structured interviews and group discussing with the villagers as well as direct observations, market research and consultation with middlemen, retailers and government officials. The aim is to track the product through the market, recording the price variations at each stage. Figure 4 illustrates a case example from the Kotwalias of South Gujarat, India.

**FIGURE 4: EXAMPLE OF A FLOW DIAGRAM OF KOTWALIA BASKET PRODUCTION AND SALE**



### Analysis:

This flow diagram represents the stages in production and sale through the market system for bamboo baskets (supra), and threshing trays (topla), made by the Kotwalias who depend on basket making for their livelihood. In the past, they had received low prices for their product from corrupt middlemen. To address this injustice, reduce illegal felling, and provide employment opportunities for the Kotwalias, the forest department set bamboo harvest quotas for basket making communities and guaranteed a market for their final product by buying back their products. The forest department harvests the bamboo through a Forest Labor Cooperative (FLC). This bamboo is then available to communities registered with the forest department. Communities use this bamboo to make bamboo products bought by the forest department in advance. The forest department then sell these products in the open market.

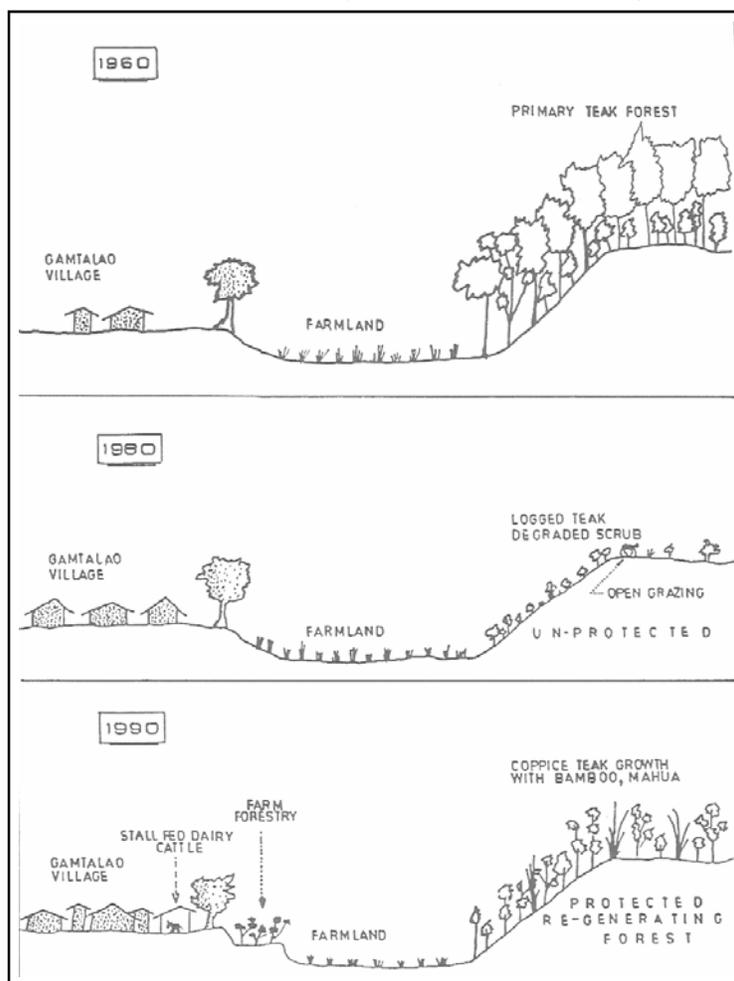
## HISTORICAL TRANSECT

The technique of having the community construct a transect of the area helps to identify successful and unsuccessful management systems so that a new management system can avoid the same mistakes and promote the positive aspects endorsed by the community. The decline and or increase of certain forest products and species can be established such that the management plan can address these issues.

### Method:

This technique requires the PRA team to engage the community, in particular village elders, to draw the forest at different historical periods. Experience suggests it is helpful for participants to begin by drawing the forest in its present condition as a baseline. The villagers can then decide the appropriate time periods, usually three to four are sufficient. The team can encourage participants to attempt to draw the size and composition of the forest trees in each period, indicating relevant management information at each interval. Participant might list the number of different species available, the type of management system, periods of logging, rules, rights, regulations, and advantages/disadvantages of a particular system. (see Figure 5)

**FIGURE 5: EXAMPLE OF A HISTORICAL TRANSECT, GANTALAO VILLAGE, INDIA**



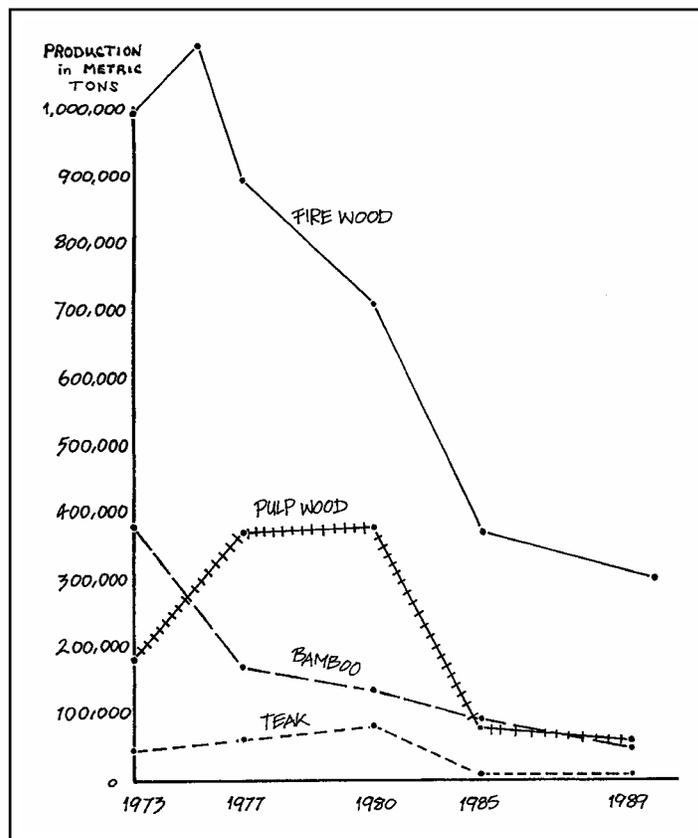
## TREND LINES

Creating a graph that diagrams changes in the population, rainfall, and volume flow of important forest products over time is important. Trend lines can also be used to chart patterns of forest disturbance and regeneration over time.

### Method:

This tool requires the PRA team to review past production methods and plot production levels over time. Through semi-structured interviews and group discussion, community members can supplement this information over time. (see Figure 6)

**FIGURE 6: EXAMPLE OF A TREND LINE FOR WOOD EXTRACTION, KARNATAKA, INDIA**



### Analysis:

This trend line illustrates the fluctuations in the production of firewood, pulpwood, bamboo, and teak over time. By questioning the communities and the forest service and comparing dates with the historical time line, we can draw conclusions as to the reason for these trends. Questions we might want to include are:

- \* Why was there a sudden drop in teak production between 1980 and 1985?
- \* Why did pulpwood and firewood see a similar decline between these years?

## SECTION II: TABLES & CHARTS

### LIST MAKING

This collaborative process allows us to (a) identify the forest products and (b) classify forest products into commercial and subsistence use. Classifications represent use categories or use types (see below). Use types may include: edible flora (mushrooms, fruit, seeds, nuts, etc); edible fauna (insects, honey, fish, animals, etc); construction material (timber for walls, grasses for ropes, etc); medicinal (leaves, bark, etc); fuels (trees, shrubs, leaves, etc); fodder, (trees, grasses, etc); and others (gums, resins, lac, etc).

#### Method:

Set aside enough time (2-3 hours) when villagers have time to think carefully and are not under pressure to perform other tasks. Separating groups into men and women to list forest species can create a competitive atmosphere which facilitates a more thorough listing and indicates gender-specific knowledge. These lists of species can be cross-checked and elaborated on by walking through the forest with knowledgeable local people.

FIGURE 7: EXAMPLE OF LIST MAKING

FOREST PRODUCT	COMMERCIAL USE	SUBSISTENCE USE
Fig Fruit	X	X
Guava		X
Teak Poles	X	X
Bamboo	X	X
Mahua Flowers	X	X
Pine Nuts		X
Acorns		X
Siris Branches		X
Eucalyptus Timber		X

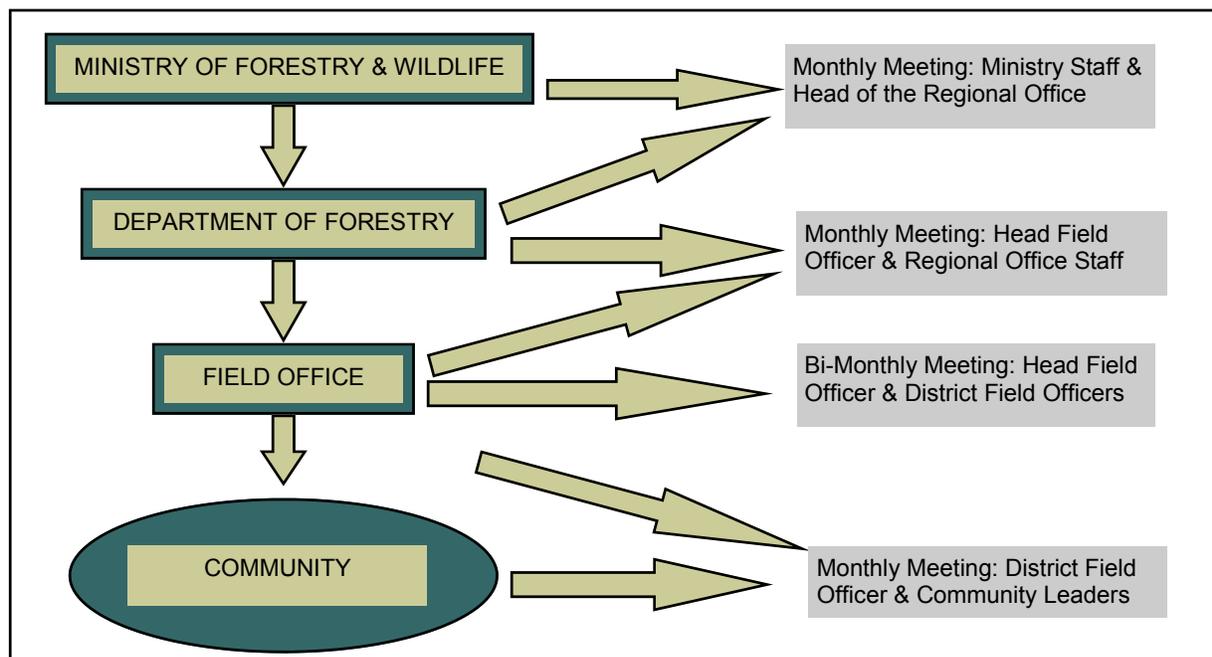
## ORGANIZATIONAL CHART

These illustrate the structures and individuals within local government organizations and technical agencies. Organizational charts can also be used to reflect indigenous organizations including village chiefs, council of elders, healers, water management organizations and leadership positions, etc. However, because traditional community leadership and institutional patterns are not linear, other visual tools like Venn diagrams may be more effective in reflecting their formations.

### Method:

Semi-structured interviews with forestry department field staff or management personnel provide the information for creating an organizational chart. This chart can then be analyzed with the field staff to better understand the constraints and capacity for participatory forestry management within the forestry department. The staff involved in the area can also be identified and incorporated as stakeholders. (see Figure 8)

FIGURE 8: EXAMPLE OF AN ORGANIZATIONAL CHART



### Analysis:

The government forestry administration hierarchy and the interaction between each hierarchical level are reflected in this organizational chart. Working from the bottom up we can assess the interaction between the community and the different administrative levels. 1) The community meets with the Department of Forestry field officer. 2) This field officer meets with the entire district field officers. 3) The district's head field officer meets with the staff at the Regional Office. 4) The head of the Regional Office meets with the staff of the Ministry of Forestry.

## TIME LINE

Time lines help identify important past events. For example, drought, forest felling, forest fires, etc. This information assists the PRA team in being better informed about the area and the potential risks posed to the natural resources. Understanding how the community dealt with past events may help the team to facilitate discussion and select suitable PRA methods.

### Method:

Initial historical documents and working plans developed by the forest department can help identify significant socio-political and environmental events. This information can provide a framework for the timeline. Semi-structured interviews can then be used to obtain oral histories of past events. These oral histories can provide details on local events, how the community perceived them, and the eventual impact of these events on forest management. (see Figure 9)

**FIGURE 9: EXAMPLE OF A TIME LINE, GANTALAO VILLAGE, INDIA**

DATE	EVENT
1922	Original village established
1925	Phulwadi falia founded
1947	Independence
1950s	Private land allocation and titling
1968-1970	Commercial clear-felling of forests in the area
1970	Kotwalia basket-makers begin to settle in Phulwadi
1980-1987	Repeated attempts and failures to reforest Gantalo area with <i>Acacia auriculiformis</i> and Eucalyptus
1988	Circle conservator and GFD staff hold meeting with Gantalo villagers to discuss reforestation, community needs, and collaborative management possibilities
1988	Formation of Gantalo Forest Protection Committee (unregistered); 25 hectares protected with enrichment planting of local species
1989	Gantalo village begins protecting 60 additional hectares; Phulwadi villagers request the people of Gantalo to allocate 35 hectares of forest land under their protection
1990	Gantalo FPC places 20 more hectares under community protection
1991	First gohar gas plant set up (12 total)
1992	Phulwadi women propose to establish <i>Mahila Mandal</i>

## RANKING

This process indicates the order of importance among the forest products that are identified by the community. For less complex issues, villagers can be asked to rank products during semi-structured interviews. For more complex issues, it is helpful to develop a pair-wise ranking system or scoring (matrix ranking) system. It is useful to compare forest products within a given type of use, i.e. fuel wood, construction timber, etc. It is also useful to limit the number of forest products/species to be ranked or scored. In order to limit the species/products to be ranked/scored, villagers should be asked to identify the most popular species within a use type. All commercial species/products should also be included.

### Method:

Select a time when ranking is less likely to cause disruption to local activities or be disturbed. Involve a wide cross-section of participants and explain the aim of the exercise. In both ranking and scoring it is important that the *all* the participants have a similar understanding of the criteria by which the participants are developing their preferences for a particular product/species for a given type of use. The researcher should attempt to identify these criteria as it provides insight into the value system associated with the different products for a given use.

### Simple Ranking:

This process involves listing the pre-selected species/products under each use. Participants are then asked to assign a score for each species/product based on their preference for it considering the given use. (see Figure 10)

**FIGURE 10 : EXAMPLE OF A SIMPLE RANKING METHOD OF COMMON FOREST SPECIES BY USE**

SPECIES	USE	SCORE 1-5 IN ASCENDING ORDER OF IMPORTANCE
Teak	Furniture	5
Teak	Construction Timber	5
Bamboo	Construction Timber	1
Teak	Poles	5
Tamarind	Fuelwood	3
Kakra	Fuelwood	2
Mahua	Oil	5
Neem	Medicinals	3
Billi	Medicinals	2
Mango	Food	5
Tamarind	Food	1

### Pair-Wise Ranking

This process involves identifying a use i.e. fodder trees. The researcher then should ask a knowledgeable local villager or villagers to identify the six most popular fodder trees.

#### Method:

A pair-wise ranking chart is prepared showing the six species on both axes. The researcher then works through the combination of pairs by asking the participants to nominate and explain their preference, i.e. Do you consider oak or siris to be a preferred fodder tree and why. The researcher then writes the preferred species in the appropriate space in the table. Once the table has been complete the number of times a species appears on the table can then be correlated to its rank, i.e. the more times the species appears the greater its preference and the higher it ranks. (see Figure 11)

FIGURE 11: EXAMPLE OF RECORDING TABLES FOR PAIR-WISE RANKING

#### Incomplete Table

Teak						
Eucalyptus						
Bamboo						
Oak						
Mulberry						
Fig						
	Teak	Eucalyptus	Bamboo	Oak	Mulberry	Fig

#### Completed Table

Teak						
Eucalyptus	Teak					
Bamboo	Teak	Eucalyptus				
Oak	Teak	Oak	Oak			
Mulberry	Teak	Eucalyptus	Mulberry	Oak		
Fig	Teak	Fig	Fig	Oak	Fig	
	Teak	Eucalyptus	Bamboo	Oak	Mulberry	Fig

**RANKING cont.**

## Ranking Order (based on Figure 11)

Teak = 5  
Eucalyptus = 2  
Bamboo = 0  
Oak = 4  
Mulberry = 1  
Fig = 2

**Analysis:**

Figure 11 demonstrates both an incomplete and complete pair-wise ranking. For a given use, in this case timber, the community is asked to identify which of the two species that correlate to a blank space would they choose based on the timber value of those species. The one chosen is then written in the blank space. For instance, in the bottom left hand corner of the box, we have “fig” on the vertical axis and “teak” on the horizontal axis. When the participants are asked which of these two species is better for timber, the species identified is written in the space immediately above teak and to the right of fig. In this case, the community identified teak as having more timber value. Once this has been done for all the pairs of species, then the number of times a species appears on the table is counted and represents its “rank.” In this case, teak appeared five times on the table and so has a rank of “5.” Fig appeared twice and so has a rank of “2.”

### SCORING (ALSO KNOWN AS MATRIX RANKING)

This process helps identify the relative importance of each forest product for the household economy. To aid comparison, it is useful to allow villagers to compare forest products within each type of use, i.e. fodder, fuel, food, etc.

#### Method:

Provide village participants with a fixed number of seeds or stones to award scores. Within a use type (i.e. fodder), the villagers are asked to distribute the seeds/stones between the different forest products, awarding more seeds to products that they feel provide greater service for the given use type. For example in Phulwadi Village, India the villagers identified that teak (a forest product) is better than mahua (another forest product) when considering 'timber' as the use type. (See Figure 12) Men and women may wish to score the products differently in which case two columns should be used. It is important that the researcher asks and explains the significance of the different scores given (why is teak a better timber product?). It is also important that the researcher identifies the criteria by which the villagers are assessing each product. For example, if we consider the use to be 'fuel wood' we may see villagers giving higher score to species (products) that 1) produce less smoke, 2) are easy to cut or collect 3) burn longer or hotter. Identifying the criteria by which the villagers use to evaluate each forest product uncovers more information about why certain species are more valuable than others. Such information will provide for a better economic analysis of the forest system.

**FIGURE 12: EXAMPLE OF TREE SCORING ACCORDING TO FIVE CRITERIA**

PHULWADI VILLAGE MATRIX RANKING OF TREES 1 = MINIMUM 6 = MAXIMUM					
	Teak	Khair	Bamboo	Mahua	Eucalyptus
Timber	X X X X X X	X X X X X	X X X X	X X	X X X
Fuel Wood	NIL	X X	NIL	X	X X X X X
Agricultural Implements	X X X X X X	X X X X	NIL	X X	X X
Medicine	X X	X	NIL	NIL	NIL
Others	NIL	NIL	X X X	X X X X X X	NIL

## SECTION IV: SPATIAL ANALYSIS

### COMMUNITY SKETCH MAPPING

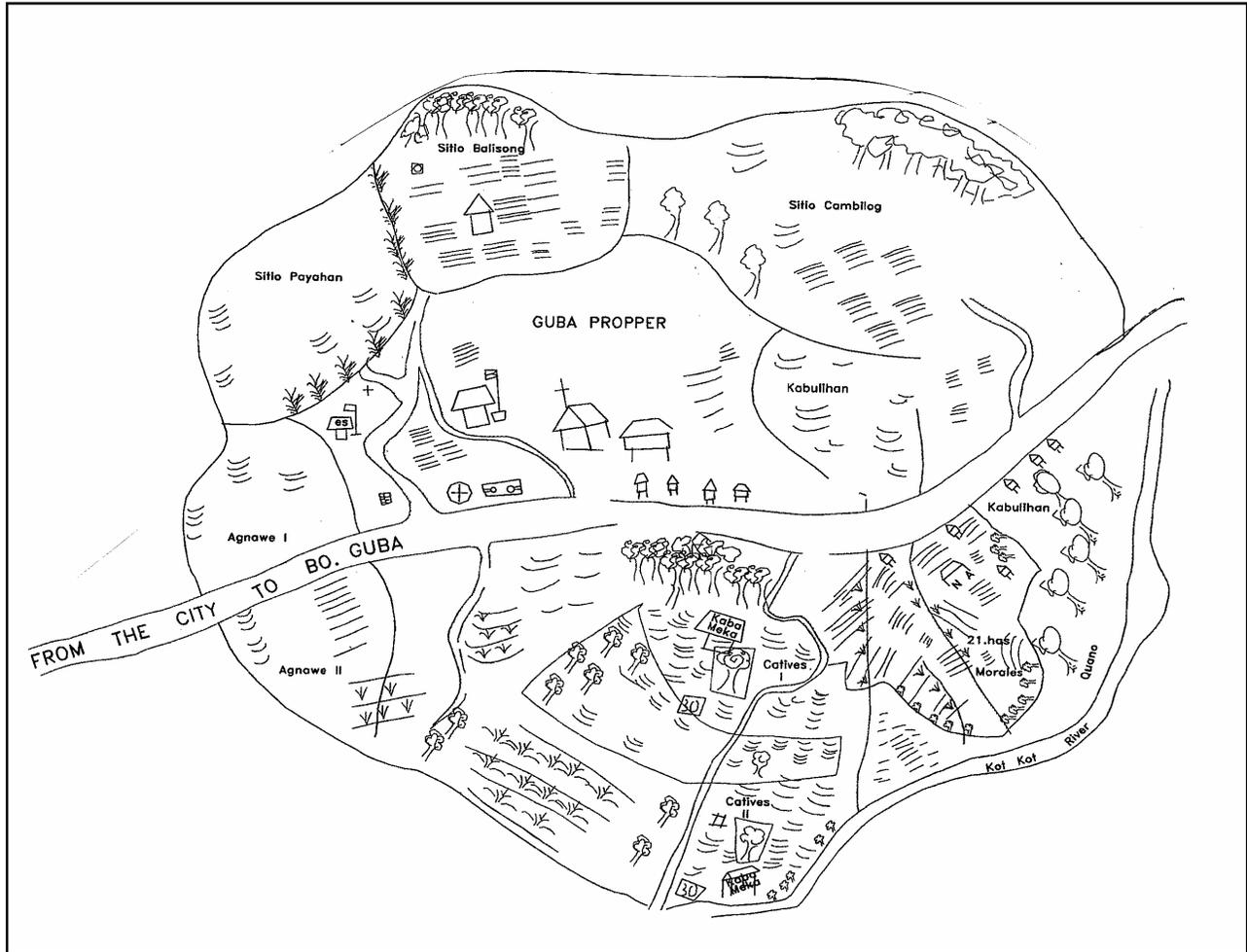
Participatory mapping techniques involve facilitating community members in developing spatial representations of their areas by creating maps on the ground or on a large piece of paper. Such maps reflect the locations of villages, forests, agricultural land, water resources, as well as management issues. The process of making the map and the discussions that occur while it is being made are important outputs of the exercise. Map information can be transferred to a paper and digitized so that it is documented for future reference.

Sketch maps provide a rapid visual representation of the resource system that is easily understood by villagers and foresters. Sketch maps also provide a means to identify the sources of forest products but also can be used to gain better information on the forest's conditions and community use patterns. This information can then be used to supplement the spatial analysis of the management area, i.e. where is the management area under discussion?

#### Method:

Researchers should explain the purpose of the exercise and request participants to draw a map of their village and adjacent forest area on the ground using local materials such as stones, twigs and leaves to identify characteristics. It is also important to undertake an initial site visit with key informants so that the researcher can become familiarized with the prominent landmarks and build rapport with the community. It is helpful for an assertive village participant (such as a schoolteacher) to initially demarcate the roads, settlements, and rivers. Community participants should be respected by the community and include women whose knowledge of the forest may be different and whose contribution is vital. Participants should be kept to a maximum of 8, however the rest of the community should be allowed to watch and contribute verbally to the mapping process. The PRA team should act as a facilitator and encourage the community to map from their own perceptions by asking simple, open-ended questions. The researcher can start by asking the participants what feature they want to represent first, (road, river, etc) and ask what color and symbol they want to use to represent the features. It is important to ask where the open access areas are. The villagers can then proceed with a discussion of other important characteristics, thereby expressing useful information about their surroundings. The process should take place in an area protected from livestock and with as little intervention as possible from the research team. The community sketch map can then be taken to the forest for a ground truth checking. A copy of the finished map should be made by the PRA team and given to the villagers.

FIGURE 13: EXAMPLE OF A COMMUNITY SKETCH MAP, KOT-KOT WATERSHED, CEBU



## WATERSHED OR SUB-DISTRICT PROFILING: MANUAL GEOGRAPHIC INFORMATION SYSTEM (MGIS)

Profiling is a visual inventory of administrative, ecological, social, and management information of a particular watershed or sub-district. It is also a tool designed to be used by field staff and their senior officers to identify and record strategic actions needed to accelerate a transition to community forest management. Topographical maps of the area on a scale of 1:50,000 are used as the base for a spatial analysis for community forest management planning. We recommend that base maps be laminated to protect them from water and dirt, and to reduce the chances of tearing in the field. Four plastic sheets, each containing distinct categories of information. (see Figure 14) Together, they illustrate administrative, ecological, social and management information and ultimately a Joint Forestry Management resource plan for the watershed or sub-district. By recording particular data onto separate acetate sheets, the different types of information can be analyzed independently as well as together. As changes occur, profile information can easily be updated either on the existing acetate sheet or by replacing it with an updated version.

### *Materials Needed:*

Four clear plastic acetate sheets at 0.003-0.005 mm. for map overlays; fine-tipped, non-water soluble pens in different colors to indicate codes on plastic acetate sheets; transparent tape to attach plastic sheets together with base map; plywood board and clamps to provide writing surface.

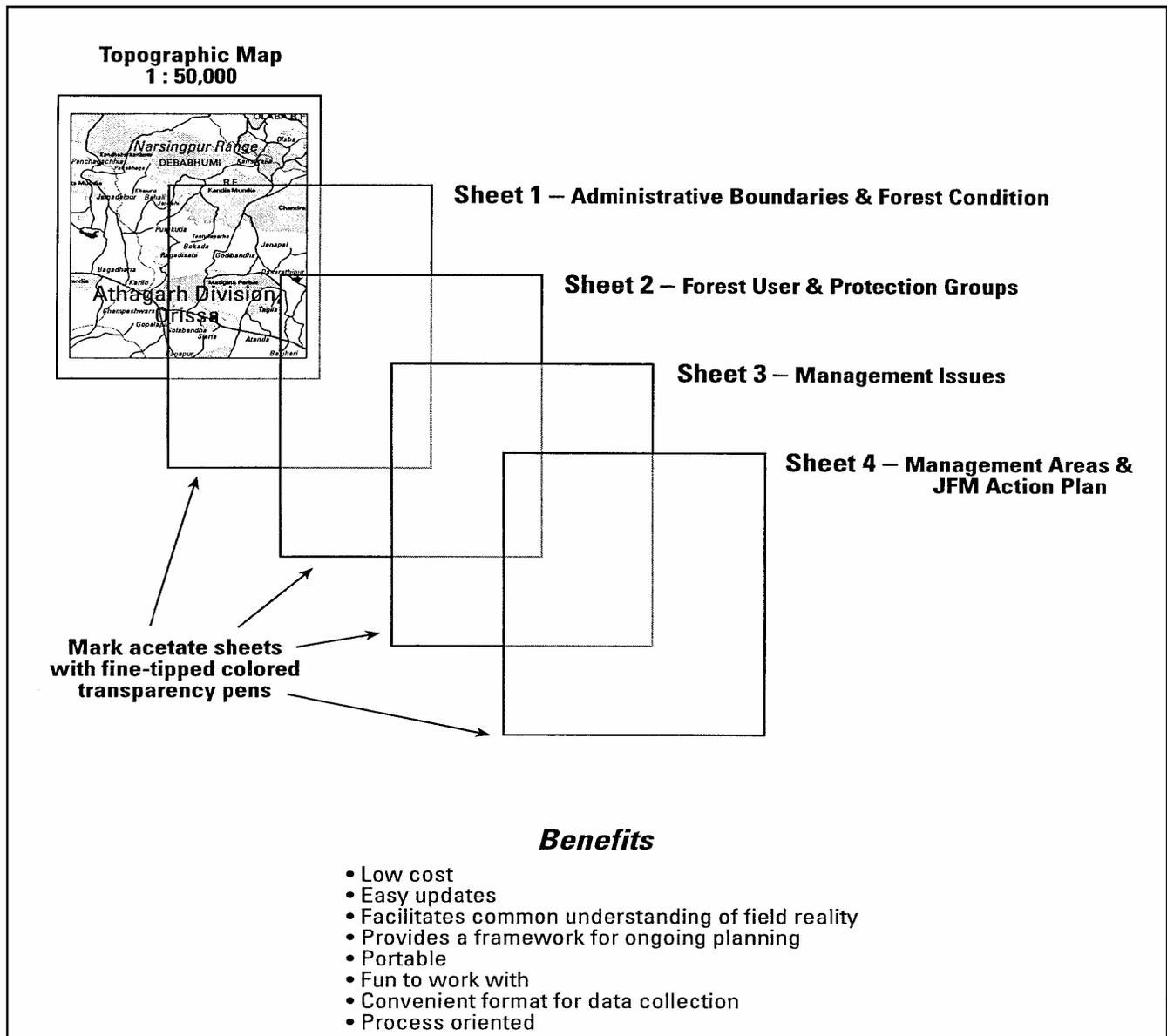
### *Groups Involved:*

All levels of field staff (local government) and NGO staff. Eventually community members are needed to cross check that stake-holding communities are included in the management area and that the forest activities of the communities are identified and correctly represented in the profile.

### **Method:**

- Acquire base map, either 1:25,000 or 1:50,000
- On Sheet 1 indicate administration boundaries and forest vegetation conditions, i.e., regenerating, degrading and barren.
- On Sheet 2 identify the location and forest use activities of communities that are stakeholders in forest management. Identify villages with active forest protection committees (FPC) versus inactive forest protection committees and communities whose members use the forest and therefore may be labeled 'potential forest protection committees'. Consult with forest user communities.
- On Sheet 3 identify pressures and conflicts on the forests such as overgrazing, illicit timber smuggling, and other disturbances. Consult with forest user communities.
- Sheet 4 should identify the management areas, identify forest boundaries that forest user groups respect, and define resource management strategies for specific FPCs (microplanning). This step requires the coordination of field/NGO staff to identify preliminary management areas, boundaries, and small-scale management strategies. This process is the next phase of fieldwork once the resource and management areas under discussion have been identified.

FIGURE 14: MANUAL GIS MAPPING TOOLS



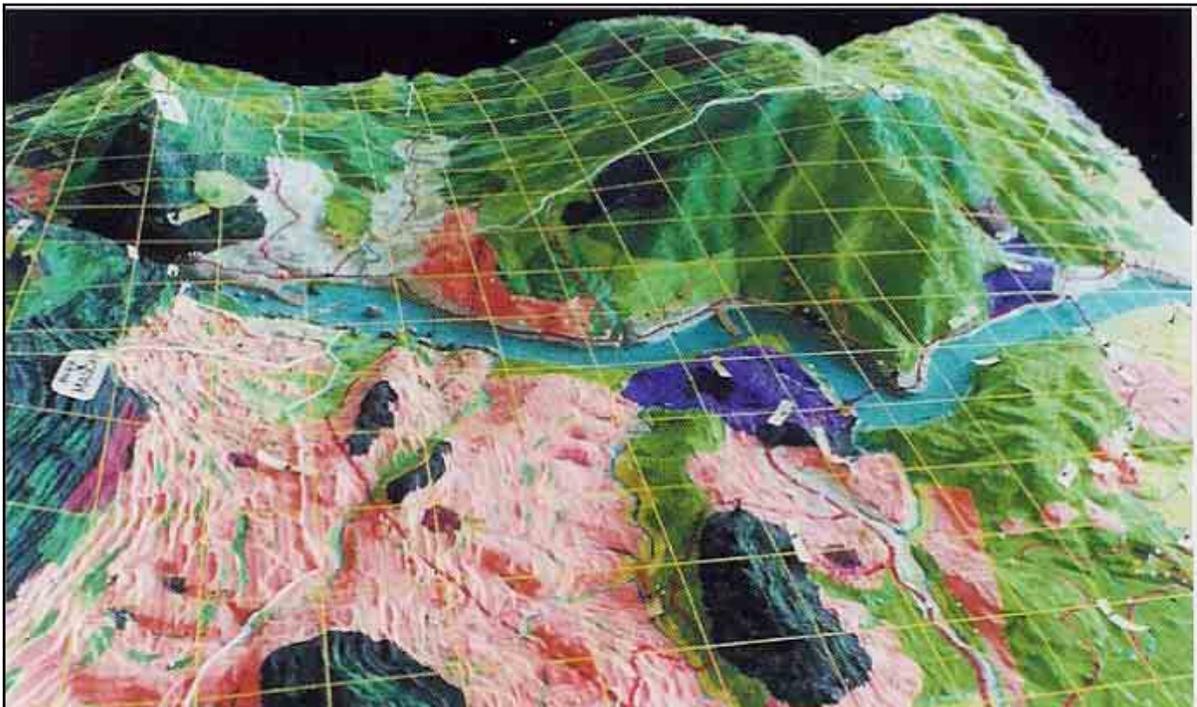
### PARTICIPATORY 3-DIMENSIONAL MODELING

Participatory 3-Dimensional Modeling (P3-DM) involves a cartographic method of merging Geographic Information System (GIS) generated data with community knowledge. P3-DM produces a stand-alone, scaled relief model illustrating the location of villages, resources, and areas of concern. The model can be updated as the management issues change and progress.

**Method:**

P3-DM involves a multi-phase process. Initial preparatory work includes identifying the area to model, selecting participants, obtaining digitized contour lines of the area, as well as obtaining the base map and adjusting the vertical and horizontal scale. The next phase is to assemble the model with the help of the community. This involves tracing each contour interval onto a cardboard sheet and cutting along the line of the contour and pasting each of these contour templates on top of one another to create an elevated surface. The model is then painted appropriately and pins are used to map information such as rivers, roads, forest area, villages, and areas of concern. The model is then presented to the community. Information from the model can then be digitized to produce a GIS translation, stored on a database. This GIS model can then be verified by comparison with existing spatial information, like maps produced from satellite-interpreted imagery.

**FIGURE 15: EXAMPLE OF A PARTICIPATORY 3-D MODEL**



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Vol I & II Available from:  
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Society for Promotion of Wasteland Development  
(SPWD)  
1 Copernicus Marg  
New Delhi, India 110001

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5266 Hollister Avenue, Bldg. B, Suite #237  
Santa Barbara, CA 93111 U.S.A.

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65726 Eschborn, Germany  
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Regional Community Forestry Training Center  
Kasetsart University  
P.O.Box 1111  
Bangkok, 10903, Thailand  
ftccor@nontri.ku.ac.th  
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Khon Kaen, 40002, Thailand

- Mapping Peoples' Forests: The Role of Mapping in Planning Community-based Management of Conservation Areas in Indonesia. Washington, D.C.: Biodiversity Support Program, 2000

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