Monitoring the Impact of Joint Forest Management on Rural Livelihoods

A report of the study conducted during the summer internship with

Winrock International-India

New Delhi

June 2005

Neha Pandey

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Aravali Institute of Management

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June 2005

Certificate

This is to certify that the research report entitled "**Monitoring the Impact of Joint Forest Management on Rural Livelihoods**" submitted in partial fulfillment of the requirement of Post Graduate Programme in Management at Aravali Institute of Management, Jodhpur, is a record of original research work carried out by Neha Pandey under my supervision and guidance at Winrock International India, New Delhi. No part of this report is submitted for the award of any other degree or diploma or other similar titles.

Date: July 2, 2005 **(Mr. Sushil Saigal)**

Certificate

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Date: July 2, 2005 **(Mr. Ashish Bhatnagar)**

Declaration

I hereby declare that the research report entitled "**Monitoring the Impact of Joint Forest Management on Rural Livelihoods**" submitted in partial fulfillment of the requirement of Post Graduate Programme in Management at Aravali Institute of Management, Jodhpur, is a record of original research work carried out by me under the supervision and guidance of Mr. Sushil Saigal, Programme Manager, NRM, Winrock International-India, New Delhi, and Mr. Ashish Bhatnagar, Assistant Professor, Aravali Institute of Management, Jodhpur, India. I also declare that no part of this research report has been submitted elsewhere for the award of any other degree or diploma or other similar titles.

I also declare that I have no competing financial interest related to the topic and study area involved in my research project. The funding for the research was provided by the Winrock International-India, New Delhi. Request for the additional material related to research (such as score tally sheet, calculation sheets) should be addressed to me at n.pandey@livelihoods.in.

Date: July 2, 2005 **(Neha Pandey)**

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The views expressed here are those of the author and not necessarily those of Winrock International-India, New Delhi or Aravali Institute of Management, Jodhpur.

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July 2, 2005

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List of Abbreviations

CIFOR	Center for International Forestry Research
FD	Forest Department
FPC	Forest Protection Committee
FSI	Forest Survey of India
gms.	Grams
Govt.	Government
GOR	Government of Rajasthan
ha	Hectare
JFM	Joint Forest Management
kg	Kilogram
kms	Kilometer
max	Maximum
mha	Million hectare
min	Minimum
mm	Millimeter
NGO	Non Governmental Organization
NGIs	Non Governmental Institutions
No.	Number
NTFPs	Non Timber Forest Products
Rs.	Rupees
SC/ST	Scheduled caste/ Scheduled Tribe
SHGs	Self Help Groups
VFPMCs	Village Forest Protection & Management Committees
y/n	Yes/ No

Summary for Policymakers

Joint Forest management is one of the most important initiatives since independence taken by Forest Departments (FD) in partnership with village communities to protect, regenerate and manage forests. This is one of the largest efforts in the world to involve village communities for the twofold objectives of the sustainable management of forests and providing for the sustainable livelihoods of participating village communities.

The Joint Forest Management (JFM) has been implemented on a large scale nationwide since 1990, covering more than 17.33 million ha of forest area being managed through more than 84,000 village forest protection and management committees (VFPMCs) groups. It is now well known that JFM has resulted in restoration and regeneration of forests in India. But it is not clearly known what impact it had on the livelihoods of the local people who collaborate to manage the forests jointly.

Although monitoring and evaluation have been done periodically to assess the performance of JFM since JFM was started in India with the government resolution issued in the year 1990, but the discussion on the impact of the JFM so far has primarily referred to its impact on restoration and regeneration of forests. Very few studies have been done to assess what impact JFM had on the rural livelihoods of village communities who are contributing to forest protection and management. This report explores the livelihoods monitoring tools to monitor the impact of JFM on rural livelihoods in Rajasthan.

Overall goal of the study was to design a Livelihoods Monitoring Tool useful for monitoring the impact of Joint Forest Management on rural livelihoods in Rajasthan. Specific objectives of the study were:

1. To learn the livelihoods monitoring approaches (i.e. a specific process and steps for monitoring livelihoods).

2. To design a conceptual framework for livelihoods monitoring (i.e. a conceptual representation/ impact pathway of potential cause-and-effect relationship between implementation of JFM and its impact on rural livelihoods).

3. To design village-level rural livelihoods monitoring tools (i.e. an intellectual instrument that helps in actually monitoring the impact of JFM on rural livelihoods).

4. To conduct a field test of the monitoring tools in sample JFM villages in Rajasthan and present the results of the study along with policy recommendations.

In other words, the research set forth the objectives to design the tool to monitor the impact of JFM on livelihoods in Rajasthan. Additionally, a perception analysis tool was also designed to know the change in livelihoods over a period of time as perceived by the community. A wide range of methods including data collection from secondary sources, primary data collection through GDs, semi structured interviews, observations, interview of key informants were employed, and the tools were tested in the field.

The study found that currently monitoring the impact of JFM on rural livelihoods has very low priority. This is surprising as one of the stated objectives of JFM implementation is the livelihoods improvement apart from improved forest cover. The tools designed through this study have been found to work well in the field. These tools can be adopted by the FDs to monitoring the impact of activities carried out under the JFM.

Although, the field test carried out under this study was intended to test the monitoring tool and to know the workability of the tools in the field, but data

collection for the field test has been done with full regard to the methods of data collection for each indicator on which the data could become available within the limitations of time and resources. Therefore, the results of the field test themselves do provide the status of livelihoods in selected JFM villages.

From the field test of livelihoods impact monitoring tool in combination with livelihoods perception analysis tool, it can be concluded that the impacts of JFM activities in all the villages are consistent and mostly positive but there are wide variations when comparisons are done among 5 capital assets. Financial capital and social capital increased substantially while physical, natural and human capital increased marginally in all the VFPMCs. Among the tested field sites, Ambua VFPMC scored highest, meaning thereby that change in scores of all the capital assets is highest in Ambua village except for natural capital which is highest in Keli VFPMC.

To conclude, there is every reason to believe that using the livelihoods monitoring tool and perception analysis tool it is possible to know the impact of joint forest management on rural livelihoods. Also, there is evidence to show that JFM has had a positive impact on the livelihoods of rural people in study villages. These tools can be applied in other forest divisions across the different regions of Rajasthan without much difficulty. But, making arrangements for raising the awareness about the livelihoods and JFM connections and providing training to help monitor livelihoods is really necessary, because there is very limited understanding of the livelihoods issues among the stakeholders.

Part One

Designing the livelihoods impact monitoring tools

Chapter 1

Introduction

Crisis of global deforestation brought about the recognition that forests may better be managed under the community-state partnerships. Joint Forest Management in India is the largest such effort in the world involving the villagers and Forest Department at unprecedented scale. An estimated 84,632 JFM groups involving 8.38 million families are managing 17.33 million hectares of forests (22.2% of the 76.5 mha of total recorded forest land) in 27 States of India. Total number of population covered under the community forestry programme is 62.39 million in India (Bahuguna *et al.* 2004).

From the beginning the stated objectives of JFM were to improve the condition of forests and provide for the sustainable livelihoods of collaborating communities (Pandey 1996). It is now well known that JFM has resulted in restoration and regeneration of forests in India (Murthy *et al.* 2002, Murali *et al.* 2002). But it is not clearly known what impact it had on the livelihoods of the local people who collaborate to manage the forests jointly (Saigal 2000, Sundar *et al.* 2001, Prasad and Kant 2003, Belcher 2005, Milne 2005). In fact there are no studies that have attempted to use the village-level livelihoods indicators to know the impact of JFM on the livelihoods of the people. Monitoring the livelihoods impact of JFM is necessary for the sustainability of the programme.

1.1 Objectives of the study

Overall goal of the study was to design a Livelihoods Monitoring Tool useful for monitoring the impact of the Joint Forest Management on rural livelihoods in Rajasthan. Specific objectives of the study were:

1. To learn the livelihoods monitoring approaches (i.e. a specific process and steps for monitoring livelihoods).

2. To design a conceptual framework for livelihoods monitoring (i.e. a conceptual representation/ impact pathway of potential cause-and-effect relationship between implementation of JFM and its impact on rural livelihoods).

3. To design village-level rural livelihoods monitoring tools (i.e. an intellectual instrument that helps in actually monitoring the impact of JFM on rural livelihoods).

4. To conduct a field test of the monitoring tools in sample JFM villages in Rajasthan and present the results of the study along with policy recommendations.

1.2 Relevance of the study

The study is relevant in two ways:

(i) It is expected to provide an opportunity to learn the livelihoods impact assessment methods at the village level based on a simple indicator-based approach.

(ii) It will also result in designing and testing of the livelihoods monitoring tools that can be used by villagers, forest department and NGI's to monitor the impact of JFM activities and interventions on rural livelihoods.

1.3 Importance of livelihoods monitoring in current scenario

So far various studies have been done on JFM, but, almost all the studies have focused on monitoring the process of JFM itself rather than monitoring the impact of JFM. More particularly, robust efforts to monitor the impact of JFM

on livelihoods are yet to be made. It is worthwhile to recall that from the very beginning the stated objectives of JFM were to improve the forest cover and livelihoods simultaneously. It is now well known that JFM has resulted in restoration and regeneration of forests in India (Murthy *et al.* 2002, Murali *et al.* 2002), but till now, the impact on livelihoods of those local people who are jointly managing the forest is not known. So, it is of utmost importance to verify and monitor the impact of JFM on livelihoods. This monitoring would help in revealing the clear picture of JFM implementation. Also, it would be helpful in further improvements and overcoming the challenges now confronting JFM.

1.4 JFM process v/s Impact of JFM on livelihoods

Policy-makers and foresters have also discussed about the JFM monitoring but they have seldom considered the livelihoods outcome/ impact of JFM. What is often meant by monitoring is the monitoring of the programme and not its impact (see for example, Bahuguna and Upadhyay 2004). In fact a recent study of over 200 examples across India found that there were no reports that have focused on the monitoring of JFM; rather all are evaluation reports (Murali *et al.* 2002, Sudha *et al.* 2003). Also, majority of these evaluations were conducted by consultants or NGOs (Rao *et al.* 2004: page 31), and very few by the implementing agency (i.e. Forest Department). And none of these examples have clear focus on the monitoring the impact of JFM on livelihoods explicitly. Some studies have expressed concern for livelihoods issues in JFM (Hill and Shields 1997, Khare *et al.* 2000, Kaushal and Kala 2004, Bond *et al.* 2003, Milne 2005), but the only study that is focusing specifically on monitoring the livelihoods impact of JFM is the one being conducted by CIFOR recently in Jharkhand (Belcher 2005, Pandey 2005).

It is to design a tool that will help monitor the livelihoods impact of the JFM. It is pertinent to note that the present study is not about the evaluation of the JFM at the village level. It is also not necessarily to know how VFPMCs are

working in the village, because there are already many such evaluations available (see for example, Ravindranath and Sudha 2004, Bahuguna *et al.* 2004). Thus, the tool being developed and tested will not directly evaluate the functioning of the JFM or VFPMCs; instead it will help to monitor the impact of JFM on rural livelihoods.

In other words, the livelihoods monitoring tool is not just an instrument to study the typical pre-JFM and post-JFM impact on livelihoods. Rather, it is a tool designed for continuous learning and adaptation so that implementing agencies and other stakeholders can modify the programme immediately, if there is a need to do so. Typically, the pre-JFM and post-JFM situation is obtained through evaluation (and not through monitoring). If monitoring tool is to be used to know the situation in pre- and post- JFM then the monitoring has to happen at least in two different intervals. But then purpose would be different. Otherwise, it is better to do a perception analysis (as this report has attempted additionally) based on the perceptions of the stakeholders about situation before and after JFM was implemented.

1.5 Relation of indicators to JFM impacts: the impact pathways

To design a conceptual framework, very first step was to learn about the expected impacts of JFM on livelihoods. Impact pathway has been very useful in anticipating and depicting such changes. An impact pathway is an explicit theory or model or hypothesis about how a project will achieve impact (Douthwaite *et al.* 2003). Impact pathway shows the activities done under JFM and their expected impacts on the five capitals/assets. It also shows the interrelationships. Impact pathway framework describes the cause and effect relationship between the implementation of JFM and its impact on rural livelihoods. With the help of impact pathway key indicators for the study were identified for all the five capitals/assets. Detailed explanation is given later in chapter 3 of the report (**Figure 3.1**). Table 1.1 also attempts to explain the relationship.

Table 1.1: Why are indicators related to the impact of JFM on rural livelihoods?

Capital	Indicators	Relation with JFM impact on livelihoods
Financial capital	1. Wages/capita from forestry works (3yr average)	1. Work availability in the village by JFM activities and wages are given in return of work.
	2. Total money deposited in the account of VFPMC	2. If committee had not been there it would not have resulted in opening an account. More deposits in VFPMC account are only possible if JFM provides work.
	3. Number of shops selling consumer goods	3. VFPMC provides loan to open the shops. Possibly more the loan amount is given more shops may be opened in village. People earning money through JFM are expected to purchase goods, thus encourage growth in shops.
	4. Average price of 3 most expensive items in shops	4. Wages given by the JFM activities and selling of forest products improves the purchasing power of the villagers. So, there will be transaction of expensive items.
Physical capital	5. Number of pukka houses/capita	5. VFPMC provides loan to create the infrastructure. Possibly more the loan amount more may be the pukka houses in village.
	6. Number of houses with electric service/capita	6. FD recommend for connection in Electricity Department on request of the villagers (as per microplan)
	7. Number of motorcycles/capita	7. After JFM is implemented there are two source of earning for the VFPMC members, one is by selling the forest products and other is through wages from forestry works. So after JFM they will be more capable of purchasing items such as motorcycle.
	8. Average travel time to nearest market	8. Roads are constructed and repaired under the entry-point activity. Average travel time is directly proportional to the condition of road and availability of vehicle (see 7).
	9. Area of irrigated land/capita	9. The more is the irrigated land, the better shall be agriculture output.
	10. Number of functioning tractors/capita	10. More number of tractors shows the ability to spend on useful items using the income from JFM.
	11. Number of functioning water pumps/capita	11. More number of water pumps shows the ability to spend on useful items using the income from JFM.
Natural capital	12. Area of JFM plantation per capita	12. Plantation is one of the objectives of JFM.

Capital	Indicators	Relation with JFM impact on livelihoods
	13. Area of key NTFP/capita	13. Under the JFM mainly NTFP species are planted.
	14. Average time spent collecting fuel wood per household per month	14. Protection of existing forest and plantation done under the JFM are expected to result in more availability of fuel wood in less time.
	15. Average time spent collecting water per household per month	15. Hand pumps and wells are constructed and maintained by FD under JFM entry-point activities.
	16. Average time spent collecting fodder/capita	16. Grass is grown by forest department. The more is the grass less is the time consumed in collecting it. Sale of grass is one of the main sources of people's income.
	17. Value of annual Bamboo production /capita	17. Income generation from selling and consumption of forest products
	18. Value of annual firewood production/capita	18. Similar to 17
	19. Value of annual NTFP production/capita	19. Similar to 17
	20. Annual food-grain production /capita	20. Similar to 17
Human capital	21. Infant mortality/capita	21. Medical camps, balwaries and health education are organized by FD for the villagers under the JFM activities.
	22. Percentage of school age children attending school	22. Villagers are motivated by FD through awareness programmes and meetings to send their children to schools. FD also makes proposals to the Government to open new schools in villages.
	23. Average age of school leaving	23. By the above activity (point no. 22) of JFM average age of school leaving increases (i.e. when studies are complete).
	24. Number of people that work outside village on a daily basis per capita	24. Wages provided by FD and more irrigation facilities under the JFM activities are expected to result in less migration
	25. Number of people that distress migrate from village to work outside for long periods per capita	25. Similar as point no. 24
Social capital	26. Proportion of adult population participating in VFMPC	26. Participation of all adults in the village in JFM activities is assumed to be better on the grounds of democracy. No other government programmes demand such participation from villagers.
	27. Proportion of VFMPC members that are women	27. Had the JFM not been there participation of women would have been negligible in village affairs. This encourages maximum and active participation of women. This

Capital	Indicators	Relation with JFM impact on livelihoods
		indicator also shows gender equity.
	28. Number of VFMPC meetings and attendance	28. Meetings and attendance for the common purpose would not have been there in the absence of VFPMC meetings. Number of meetings and high attendance shows the active participation in village welfare activities. This also shows effectiveness of the VFPMC.
	29. Microcredit/self-help groups (SHGs) in village (y/n)	29. SHGs are made on the basis of skills of the villagers by providing training to them for the additional income. This additional income would not have been possible if JFM was not working there (as there is no other department working on this aspect).
	30. Collective selling of agricultural or forest products results in improved prices (y/n)	30. Collective selling is encouraged by FD which results in improved bargaining power and better prices. This concept wherever applied was initiated by JFM activities.

1.6 Structure of the report

Overall, report is organised in three parts. Part one describes the designing the livelihoods impact monitoring tools, Part two describes the field testing of the monitoring tools and Part three discusses the conclusions and policy recommendations. In particular, report is organised in chapters as follows:

- In Introduction, the report establishes the subject, defines the objectives, briefly reviews the literature and suggests relevance of the study (chapter 1).

- The description of livelihoods assets available to rural communities: Financial capital, physical capital, natural capital, human capital and social capital (chapter 2)

- The methodology for designing the livelihoods monitoring tools for the research is provided. It also describes the review and finalisation of the

tools among stakeholders and limitations during the designing of the monitoring tools (chapter 3).

- The description of the field-test sites includes the physical, social and ecological attributes of Rajasthan and Mewar in general, Udaipur, and VFPMCs in particular (chapter 4).

- Subsequently, the report describes the methods of data collection for monitoring tools (chapter 5).

- Results and discussion on the operational aspects of the livelihoods monitoring tools, present status of livelihoods in study sites, condition of sample villages' pre-and-post JFM, and impact of JFM on rural livelihoods are presented (chapter 6).

- Finally, the report provides general conclusions (chapter 7) and draws recommendations providing insights on the paradox of stated objectives and ground situation about JFM and livelihoods (chapter 8).

Chapter 2

Livelihoods assets available to rural communities

The concept of livelihoods integrates ecological, economic and social well-being of people. The livelihoods framework identifies five core asset/capitals. These are physical, financial, social, natural, and human capital. The capital assets are closely linked to each other (see Figure 3.1). Indicators for each of the five capital assets can be derived using the impact pathways. The tendency to bias indicator selection to one particular capital is thus avoided. As Campbell *et al.* (2001) put it, "the advantage of using the sustainable livelihoods approach is that the concept has been vigorously debated in the literature and forms a relatively sound theoretical basis for indicator selection".

2.1 Financial Capital

Financial capital comprises savings, remittances and other cash assets. JFM is expected to increase direct consumption and increase in earnings through sale of forests and agricultural products and also by sale of products from employment generating activities with the help of SHGs (Belcher 2005). Financial capital plays an important role in our economy, it helps us to facilitate the other types of capital to be owned and traded. Unlike the other types, it has no real value itself but can also be a representative of natural, human and social capitals.

2.2 Physical capital

Physical capital is capital created by people themselves. For example, houses, vehicles, agricultural machinery, communication facilities, transport infrastructure and so on. JFM may involve direct investment in community

assets such as roads, digging wells, tube wells and hand pumps through entry-point activities. It is expected that increased earnings from these facilities can be invested in physical assets including productive assets and consumable items.

2.3 Natural Capital

Natural capital refers to the forest, land, water, biodiversity and many environmental services available to people. Conservation of natural capital is one of the key aims of JFM apart from livelihoods improvement (Belcher 2005). To achieve this objective VFPMC gives people more rights and responsibilities over forest resources. And also, VFPMC is intended to improve the stock and flow of resources (see, Chopra and Gulati 1998).

2.4 Human Capital

Human capital consists of people's education, knowledge, skills, information, health and motivation. JFM is expected to contribute directly in enhancing human capital through education and training and providing better medical facilities with the help of medical camps and dispensaries. It is also expected that increased income and savings will be invested for the development of human capital (Belcher 2005).

2.5 Social Capital

Net worth of individuals can be judged by the networks they belong to. The gain that individuals have due to belonging to a particular network is the social capital. Social capital concerns the institutions that help us to maintain and develop human capital in partnership with others; e.g. families, communities, committees, businesses, trade unions, schools, and voluntary organisations. It also includes networks, groups and trust. JFM is directly contributing in social capital formation and making the social networks stronger.

Chapter 3

Methodology for designing the livelihoods monitoring tools

3.1 Designing the monitoring tools

In order to achieve the objective to design a monitoring tool for rural livelihoods assessment underlined steps have been followed:

Literature review: Published literature on livelihoods monitoring and identification of the available conceptual frameworks and tools to understand the subject better.

Conceptual framework: Based on the general lessons from the literature review a conceptual framework (impact pathways) and livelihoods monitoring tools were prepared that have been used for monitoring the livelihoods impact of JFM in Rajasthan.

To design a conceptual framework, the foremost step was to plot the impact pathway (**Figure 3.1**). Impact pathway shows the trajectories of JFM activities, their impact on capitals and interrelationship between the five capitals/assets (**Figure 3.2 - 3.4**). Thus, conceptual framework describes the cause and effect relationship between the pre- and –post implementation of JFM and the impact it may have on rural livelihoods. With the help of the impact pathway key indicators for the study were identified for all the five capital assets.

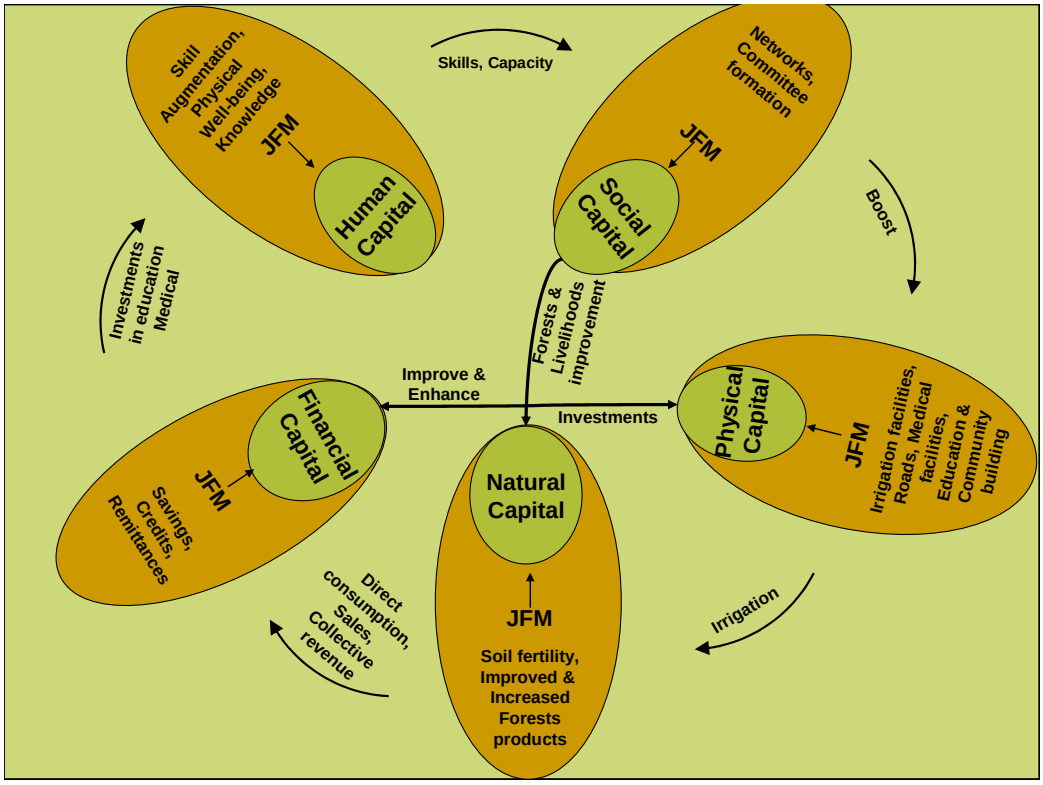

Figure 3.1: Livelihoods Improvement Impact Pathways
[Source: Modified after Belcher (2005)]

Monitoring tools: In order to design monitoring tools to assess the impact of JFM on rural livelihoods, CIFOR's template was used. Belcher (2005) proposes a village level indicator-based monitoring tool. This monitoring tool is a livelihoods assessment process based on impact pathways and village level indicators which were identified from the five capitals:

- Natural Capital
- Financial Capital
- Physical Capital
- Social Capital
- Human Capital

This five capitals indicator based tools are important in assessing the overall change in livelihoods. Indicators are interrelated with each other. For example, an increase in the Natural Capital may increase the income and revenue (i.e. financial capital) by means of collecting and selling forest products, which in turn improve the purchasing power and standard of living (i.e. social and physical capital).

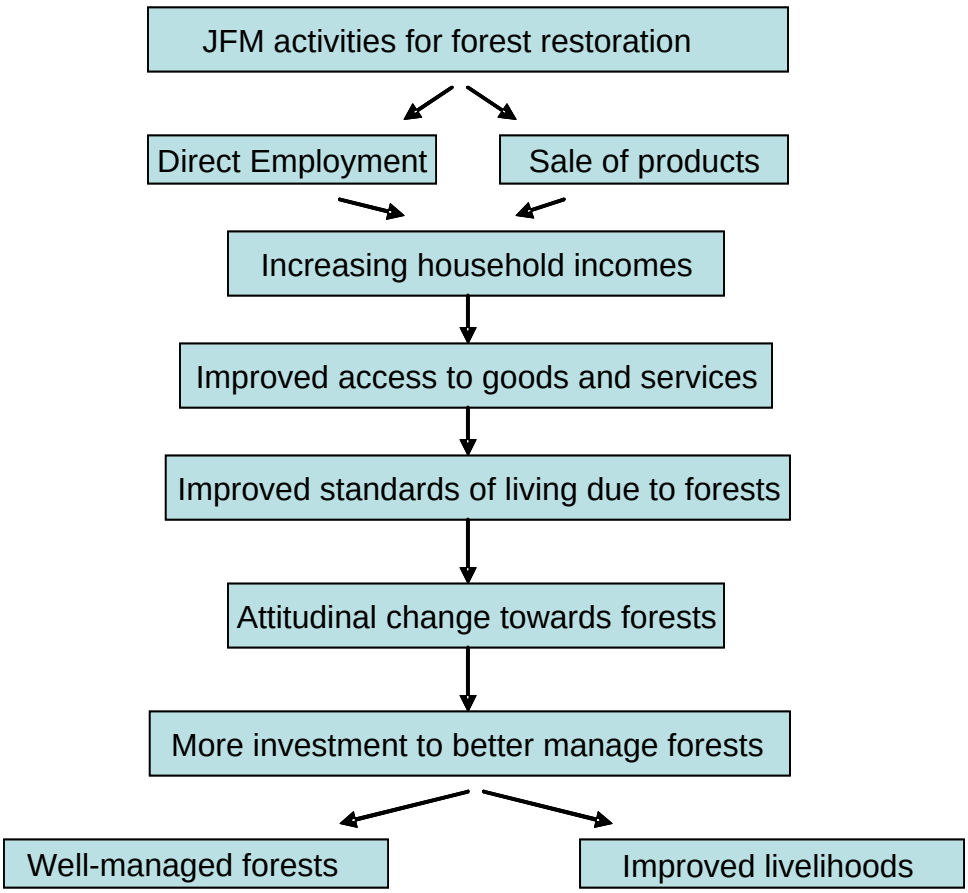

Figure 3.2: Community-drawn linear model for impact pathway of JFM. *Note that majority of JFM activities will have multiple impacts and thus multiple impact pathways as shown in Figure 3.1.*

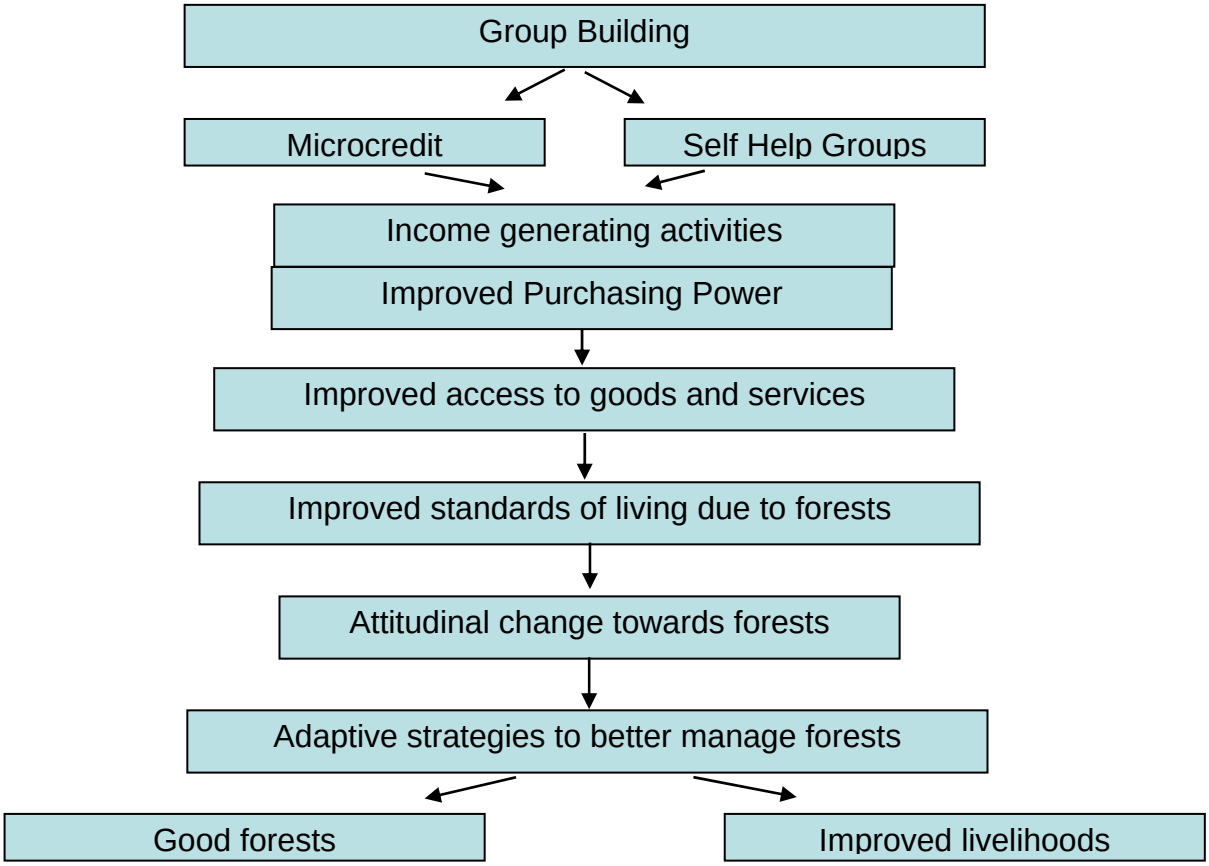

Figure 3.3: Community-drawn linear model for impact pathway of JFM. *Figure shows how social capital in terms of group building will help in improved livelihoods and better managed forests.*

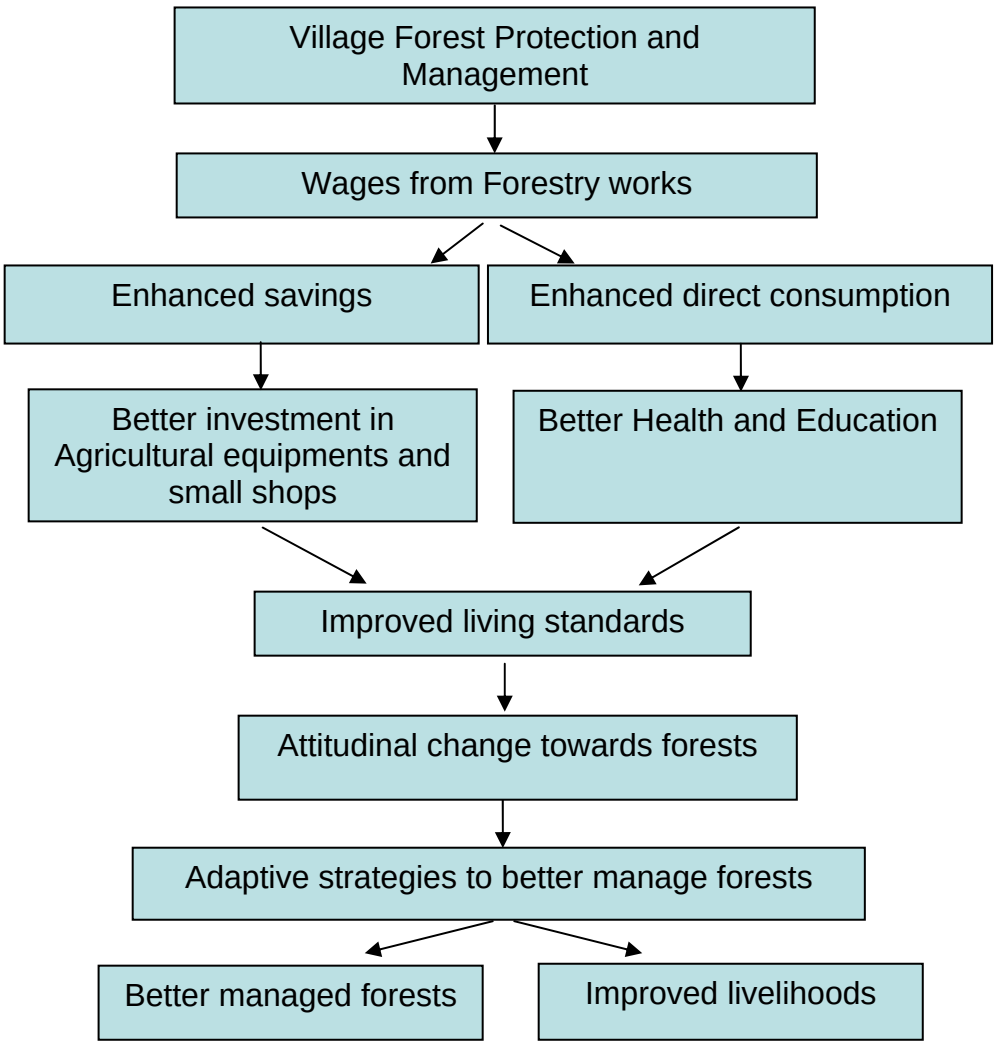

Figure 3.4: Community-drawn linear model for impact pathway of JFM. *Figure shows how social capital of VFPMC members will help in improved livelihoods and good forests.*

Two related tools were designed for the purpose of monitoring the impact of JFM on rural livelihoods.

3.1.1 Livelihoods monitoring tool

This tool was designed for periodical assessment of rural livelihoods. Tool contains indicators based on five capitals (financial capital, physical capital, natural capital, human capital and social capital). Methods for collecting data on each indicator were also identified to make the process simpler (**Table 3.1**).

Table 3.1: Livelihoods monitoring tool: Indicators and methods of data collection

Capital	Indicators	Methods and Sources of Information
Financial capital	1. Wages/capita from forestry works (3yr average) 2. Total money deposited in the account of VFPMC 3. Number of shops selling consumer goods 4. Average price of 3 most expensive items in shops	1. FD records 2. VFPMC record 3. Survey of shops 4. Survey of shops
Physical capital	1. Number of pukka houses/capita 2. Number of houses with electric service/capita 3. Number of motorcycles/capita 4. Average travel time to nearest market 5. Area of irrigated land/capita 6. Number of functioning tractors/capita 7. Number of functioning water pumps/capita	1. Observation/key informants 2. Observation/key informants 3. Observation/key informants 4. Observation/key informants 5. Observation/key informants 6. Observations/key informants 7. Observation/key informants
Natural capital	1. Area of JFM plantation per capita 2. Area of key NTFP/capita 3. Average time spent collecting fuel wood per household per month 4. Average time spent collecting water per household per month 5. Average time spent collecting fodder/capita 6. Value of annual Bamboo production /capita 7. Value of annual firewood production/capita 8. Value of annual NTFP production/capita 9. Annual food-grain production /capita	1. FD record 2. FD /key informants 3. Key informants 4. Observation/key informants 5. Key informants 6. Key informants 7. Key informants 8. FD records 9. Key informant/village records
Human capital	1. Infant mortality/capita 2. Percentage of school age children attending school 3. Average age of school leaving 4. Number of people that work outside village on a daily basis per capita 5. Number of people that distress migrate from village to work outside for long periods per capita	1. Village records/key informants 2. School records 3. School records 4. Observation/key informants 5. Observation/key informants
Social capital	1. Proportion of adult population participating in VFMPC 2. Proportion of VFMPC members that are women 3. Number of VFMPC meetings and attendance 4. Microcredit/self-help groups (SHGs) in village (y/n) 5. Collective selling of agricultural or forest products results in improved prices (y/n)	1. VFMPC Secretary 2. VFMPC Secretary 3. VFMPC Secretary 4. Observation/key informants 5. Key informants/ focus group

Note: Candidate set of village-level indicators for monitoring the livelihoods impact of JFM in Rajasthan have been identified taking the CIFOR tool as a base template and exploring its applicability in Rajasthan (modified after Belcher 2005)

3.1.2 Livelihoods perception analysis tool

This tool is an extension of livelihoods monitoring tool. This tool was designed to know the perception of stakeholders to get the results in one shot. Each indicator identified was scored based on three perceived conditions by stakeholders: best, moderate and worst and were assigned score 3, 2 and 1 respectively. Assigning scores was done in order to make all indicators quantifiable and comparable with each other. Cumulative score for each capital was calculated by multiplying the number of respondents to the score assigned and then adding up all the scores obtained by each indicator for before-and-after situation individually within the capital.

Perception analysis is an important tool to know the past and current positions related to particular factors. The best known perception index is the famous Corruption Perception Index (CPI) that has been to assess the governance and its effect on the loss of biodiversity. Study by Smith *et al.* (2003) found strong associations between governance scores and changes in the numbers of threatened species. Countries rich in species and identified as containing priority areas for conservation have lower governance scores than other nations. Likewise, perception analysis has been used as core methodology in a recent study of spread, performance and impacts of joint forest management (see the book-length study by Ravindranath and Sudha 2004). Similarly, all survey and interview based methods in social sciences are essentially perception based (i.e. the perception of the respondents). Thus, in the absence of robust data related to earlier years perception analysis is a useful tool for knowing the before- and after situations.

Table 3.2: Score sheet for monitoring livelihood in Rajasthan based on stakeholders perception

Capital	Indicator	Scoring					
		Before JFM			After JFM		
		3	2	1	3	2	1
Financial Capital	1. Wages/capita from forestry works (3 years average)	High	Moderate	Low	High	Moderate	Low
	2. Total money deposited in [1]VFPMC in a year (In Rs.)	> 500000	25000 - 50000	< 25000	> 500000	25000 - 50000	< 25000
	3. Money deposited in the a/c of VFPMC (No. of times in a year [2])	≥ 6	1 - 5	0	≥ 6	1 - 5	0
	4. No. of shops selling consumer goods	≥ 0.005	0.001 - 0.004	0	≥ 0.005	0.001 - 0.004	0
	5. Average price of 3 most expensive items in shops	> 100	50-100	< 50	>100	50 - 100	< 50
Physical Capital	6. No. of Pucca houses/capita	> 0.08	0.04 – 0.08	< 0.04	> 0.08	0.04 - 0.08	< 0.04
	7. No. of houses with electric service/ capita	> 0.08	0.04 – 0.08	< 0.04	> 0.08	0.04 - 0.08	< 0.04
	8. No. of Motor cycles/capita	> 0.08	0.04 – 0.08	< 0.04	> 0.08	0.04 - 0.08	< 0.04
	9. Average travel time to nearest market	< 30 min	30 - 60 min	> 60 min	< 30 min	30 - 60 min	> 60 min
	10. Area of irrigated land/capita (In hectare)	> 0.010	0.005 – 0.010	< 0.005	> 0.010	0.005 – 0.010	< 0.005
	11. No. of functioning Tractors/capita	> 0.05	0.025 – 0.05	< 0.025	> 0.05	0.025 – 0.05	< 0.025
	12. No. of functioning Water Pumps/capita	> 0.05	0.025 – 0.05	< 0.025	> 0.05	0.025 – 0.05	< 0.025
Natural Capital	13. Area of JFM plantation/capita	Upon 10% of forest area	Upon 5% of forest area	Below 2.5% of forest area	Upon 10% of forest area	Upon 5% of forest area	Below 2.5% of forest area
	14. Area of key NTFP/capita	Sufficient & increasing	Sufficient but stable	Decreased	Sufficient & increasing	Sufficient but stable	Decreased
	15. Average time spent collecting fuel wood per household per week	< 10 Hrs.	10 – 20 Hrs.	> 20 Hrs.	< 10 Hrs.	10 – 20 Hrs.	> 20 Hrs.
	16. Average time spent collecting water per household per week	< 7 Hrs.	7 – 14 Hrs.	> 14 Hrs.	< 7 Hrs.	7 – 14 Hrs.	> 14 Hrs.
	17. Average time spent collecting fodder/ household per week	< 10 Hrs.	10 – 20 Hrs.	> 20 Hrs.	< 10 Hrs.	10 – 20 Hrs.	> 20 Hrs.
	18. Value of annual Bamboo production/capita	Sufficient & increasing	Sufficient but stable	Decreased	Sufficient & increasing	Sufficient but stable	Decreased
	19. Value of annual firewood production/capita	Sufficient & increasing	Sufficient but stable	Decreased	Sufficient & increasing	Sufficient but stable	Decreased
	20. Value of annual NTFP production/capita	Sufficient & increasing	Sufficient but stable	Decreased	Sufficient & increasing	Sufficient but stable	Decreased
	21. Annual food-grain production/capita	Surplus	Sufficient	Deficit	Surplus	Sufficient	Deficit

Capital	Indicator	Scoring					
		Before JFM			After JFM		
		3	2	1	3	2	1
Human Capital	22. Infant mortality/capita[3]	< 68	68 - 83	> 83	< 68	68 - 83	> 83
	23. Percentage of school age children attending school	100%	80 – 90%	Below 80%	100%	80 – 90%	Below 80%
	24. Average age of school leaving	18 yrs.	11 – 18 yrs.	Below 11 yrs.	18 yrs.	11 – 18 yrs.	Below 11 yrs.
	25. No. of people that work outside village on a daily basis per capita	0	1 - 40% of the TWP[4]	> 40% of the TWP[4]	0	1 - 40% of the TWP[4]	> 40% of the TWP[4]
	26. No. of people that distress migrate from village to work outside for long periods/ capita	0	1 - 40% of the TWP[4]	> 40% of the TWP[4]	0	1 - 40% of the TWP[4]	> 40% of the TWP[4]
Social Capital	27. Proportion of adult population participating in VFMPC	≥ 50%	25 – 50%	< 25%	≥ 50%	25 – 50%	< 25%
	28. Proportion of VFMPC members that are women	≥ 50%	25 – 49%	< 25%	≥ 50%	25 – 49%	< 25%
	29. No. of VFPMC meetings in a year	≥ 6	3-5	≤ 2	≥ 6	3-5	≤ 2
	30. Attendance of VFPMC members in meetings	> 50%	25-50%	<25%	>50%	25-50%	<25%
	31. Micro credit/self-help groups (SHGs) in village (y/n)	Yes	Being initiated	No	Yes	Being initiated	No
	32. Collective selling of agricultural or forest products results in improved prices (y/n)	Yes	To a great extent	No	Yes	To a great extent	No
	34. Proportion of total SC/ST population participating in VFPMC	> 50%	50 – 25%	< 25%	> 50%	50 – 25%	< 25%

Note: The candidate indicators have been selected based on Belcher (2005) and Pandey (2005) as per the presentations made by CIFOR team in Ranchi during April 2005. See Annex. 1 for scoring method.

3.2 Review and finalisation of the monitoring tools among stakeholders

Several brainstorming sessions among peers and stakeholders were used in review process to make monitoring tools more comprehensive, more useful, more relevant, and easy to use. These stakeholders include Forest Department personnel (CCFs, CFs, DCFs, ACFs, ROs, Foresters, FGs, CGs), Non Governmental Institutions and VFPMC members. In this process stakeholders gave their insightful inputs that were used to modify the tools. The tools were modified, wherever necessary, according to the suggestions given by the stake holders. The method is very similar to the process when a company does brainstorming in the product development process with various

stakeholders to generate the idea, develop the product and make the product successfully available in the market. Over all, drawing on the managerial sciences an iterative process of tool/product development was applied.

Thus, the Indicators were modified according to the study area and with the help of iteration process (reviewing tool again and again for suggestions and improvements) from stakeholders and key informants. Table indicates suggested change and reasons for change, if any, and also sources who can provide information.

The usefulness of this tool is that it can be used to assess the individual capital as well as indicator performance in particular VFPMC. As individual capital can be measured by this tool, one can get the clear indication on whether or not a particular capital is improving. Using the insights, stakeholders can put efforts to improve upon the activities that affect a particular capital. In the absence of a proper monitoring it is difficult for the forest department officials and NGOs to understand that after putting so much of effort, what impact JFM had on the livelihoods of the local people? This question can be answered by the help of the livelihoods monitoring tool.

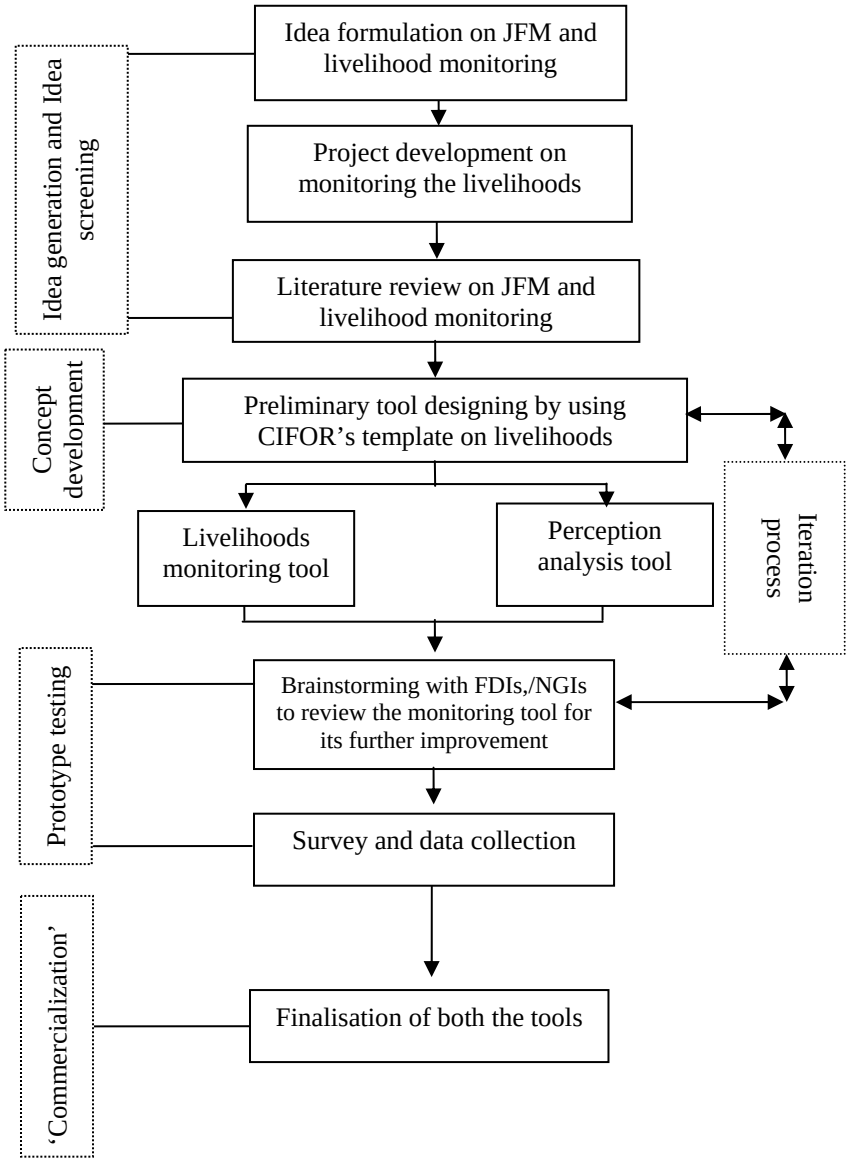

Figure 3.5: Process of developing the livelihoods monitoring tool

3.3 Limitations during the designing of the monitoring tools

There are some real limitations that this study confronted when designing the monitoring tools. These were:

1. **Lack of related studies:** Reports and studies on the impact of JFM on livelihoods or livelihoods monitoring are not many. So, this study has to rely on limited guidance available from the literature.

2. **Short time span:** Available time for study was just 60 days which was very short for conducting such a study involving the designing, developing, and reviewing the tool as well as data collection, analysis and report writing for the field test.

3. **Problems of stakeholders' participation:** Many of the reviewers were not really aware of the concepts and usefulness of livelihoods impact monitoring. They did not take keen interest initially in review process. Large amount of time had to be invested in explaining explain the concept to them. Forest Department staff really requires lot of efforts to do this kind of work which is very useful for them. It would be better to organize a proper training for FD staff, non-governmental organizations and VFPMC members before monitoring implementation. For this study such training was not possible because of financial, manpower and time limitations.

4. It was difficult to convert some situation in numbers. Some indicators were non-convertible and some indicators were given one marks even when data was zero there.

Part Two

Field Testing the Monitoring Tool

Chapter 4

Field-test sites

4.1 Introduction

The survey was conducted in the four villages of Udaipur, Rajasthan. Rajasthan, the largest state of India with a geographical area of 34.22 million ha, constitutes 10.41 % of the total land area of the country. It lies between 23° 30' and 30°11' north latitudes and 69°29' and 78°17' east longitudes. Rajasthan can be divided into four major physiographic regions, i.e. the western desert with barren hills, level rocky plains and sandy plains; the Aravallis hills running south-west to north-east starting from Gujarat and ending in Delhi; the eastern plains with rich alluvial soils and the south-eastern plateau. Major rivers of the state are the Mahi, the Chambal and the Banas. There is marked difference in the physiographic features of the state. The Aravallis cover over 30% of the state. A vast expanse of arid and semi-arid tract lies in the west of the Aravallis. The Vindhyan hill system in the south-east of the state drains into Chambal and Banas rivers. In the fragile sedimentary tracts of these rivers ravine formation is a very serious problem. The climate of the state varies from semi-arid to arid. The temperature ranges from 25ºC to 50ºC. The average rainfall ranges from 480 mm to 750 mm, being as low as 150 mm in arid western region and 1,000 mm in the south-eastern plateau.

The total population of Rajasthan as on 1st March 2001 stood at about 56.47 million as per the Census of India 2001. Rajasthan has recorded a growth rate of 28.33% compared to national average of 21.34% during the decade 1991-2001. The sex ratio (i.e., the number of females per thousand males) of population in the State has enhanced from 910 in 1991 census to

922 in the 2001 census as against National average of 945 to 933. The population density is now 165 persons per sq km, up from 129 in 1991 as against National average of 324, up from 267 persons per sq km. The literacy rate has remarkably improved from 38.55% in 1991 Census to 61.03% in 2001 Census. The livestock population is 48.44 million. As per the 1991 census the Scheduled Tribes constitutes 12.44% of the total population of the state.

The total forest area of the state is 3.17 million ha which constitutes 9.26% of geographic area. By legal status Reserved Forest constitutes 37%, Protected Forest 53% and Unclassed forest 10%. Ecologically, there are two main forest types namely Tropical Dry Deciduous and Tropical Thorn forests. Forests are mostly confined in eastern and southern parts of the state. The western part of the state is devoid of forests because of prevailing hot arid condition associated human population pressure. However, the entire region is dotted with vegetation because of the strong local tradition of agro forestry and traditional tree growing by people.

There are 4 National Parks and 24 Wildlife Sanctuaries, covering an area of 0.96 million ha, which constitutes 2.80% of the geographic area of the state. Ranthambore and Sariska are the two tiger reserves located in the state. Keoladeo Ghana National Park, Bharatpur is of international importance for its rich avifauna and for migratory Siberian crane. Sambhar Lake and Ghana are the Heritage and the Ramsar sites of the country. Picchola-Fateh Sagar National Wetland Complex, a wetland of national importance with an area of 1,000 ha, is located in Udaipur district.

There are 7,114 villages having forests as a land use. In these villages, about 2.11 million ha is classified as forest. The extent of forests in villages in Rajasthan is given in Table 4.1. According to this, while 14% villages have average 500 ha forests, 39% have 100-500 ha, and 47% villages have less than 100 ha forests.

Table 4.1: Forests as land use in villages, Rajasthan

Forest area	No. of villages	Total Forest area ('000 ha)	Population (in million)
Less than 100 ha	3,389	147.44	2.616
100 – 500 ha	2,721	676.98	2.786
More than 500 ha	1,004	1285.55	1.379
Total	**7,114**	**2109.98**	**6.781**

Source: FSI (1999)

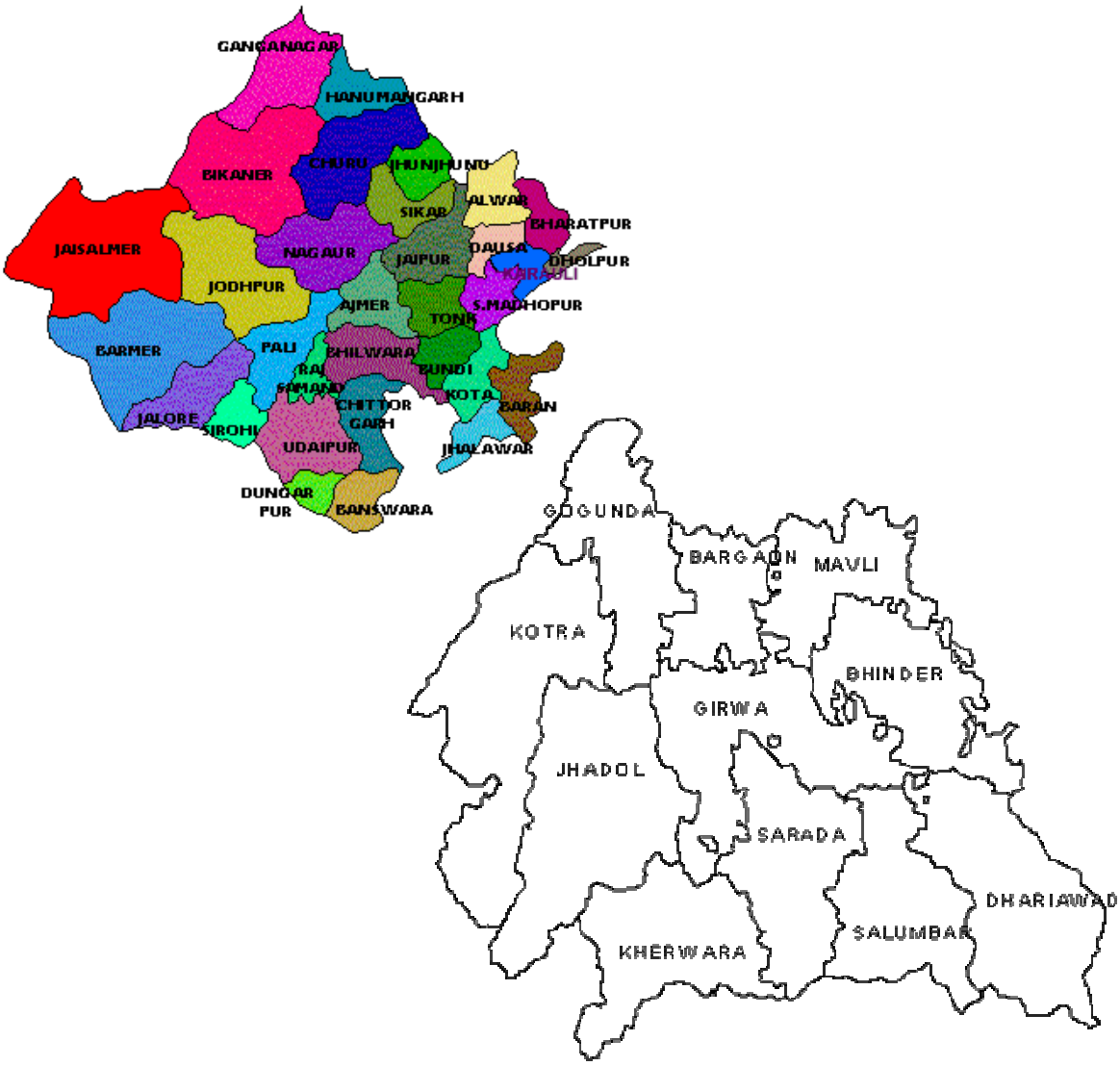

Figure 4.1: Map of the Study Area

4.2 History

Archaeological and historical evidence shows a continuous human habitation of the area dating back 100,000 years. Between the 7th and the 11th century AD, several dynasties arose, with Rajput strength reaching its peak at the beginning of the 16th c. Emperor Akbar brought the Rajput states into the Mughal empire; by early 19th c, they allied with the Marathas. With the decline of the Mughals, the Rajputs gradually clawed back their independence through a series of spectacular victories, but, by then a new force to reckon with, had emerged on the scene in the form of the British. Most Rajput states entered into alliances with the British, which allowed them to continue as independent states, each with its own maharaja, subject to certain economic and political constraints. These alliances proved to be the beginning of the end of the Rajputs, and soon the extravagance and indulgence of the rulers led to the disintegration of the Rajput kingdoms. The present form of Rajasthan came into being after the Independence.

4.3 Society and Culture

The Rajputs though representing only a small percentage of the population are the most important section of the population in Rajasthan. They are proud of their warlike reputation and of their ancestry. The Brahman class is subdivided into many gotras, while the Mahajan (the trading class) is subdivided into a bewildering number of groups. Some of these groups are Jainas, while others are Hindus. In the north and west the Jats and Gujars are among the largest agricultural communities.

4.4 Economy and Infrastructure

Rajasthan's economy is mainly agricultural and pastoral; millet, wheat, maize (corn), and cotton are grown. Though parts of the state are extremely dry, and are covered by the Thar Desert, the total cultivable area in the state is 27,465

thousand hectares, and the sown area, 20,167 thousand hectares. Tourism and mining are also an important part of the economy.

Primarily an agricultural and pastoral economy, Rajasthan also has good mineral resources. Rajasthan accounts for India's entire output of zinc concentrates, emeralds and garnets, 94% of its gypsum, 76% of silver ore, 84% of asbestos, 68% of felspar and 12% mica. It has rich salt deposits at Sambhar and elsewhere and copper mines at Khetri and Dariba. The white marble is mined at Makrana near Jodhpur. The main industries are textiles, the manufacture of rugs and woolen goods, vegetable oils and dyes. Heavy industries include the construction of railway rolling stock, copper and zinc smelting. The chemical industry also produces caustic soda, calcium carbide and sulphuric acid, fertiliser, pesticides and insecticides. The principal industrial complexes are at Jaipur, Kota, Udaipur and Bhilwara.

Table 4.2: Area by Forest Type in Rajasthan

S.No.	Type	Forest Area (ha)	% of Total Forest Area
i	Dry teak forests	224,787	7.05
ii	Subsidiary edaphic type of dry tropical Anogeissus pendula forests	1,902,775	59.65
iii	Northern tropical dry deciduous mixed forests	864,322	27.09
iv	Tropical thorn forests	185,452	5.81
v	Sub-tropical evergreen forests	12,664	0.40
	Total	**3,190,000**	**100.00**

Source: GOR (1996)

4.5 Joint Forest Management in Rajasthan

Immediately after the Government of India Resolution of June 1, 1990, JFM notification was issued by the Government of Rajasthan in 1991 and subsequently revised in the year 2000 after a broad consultation with NGOs,

Community and other stakeholders. A total of 2,705 Village Forest Protection and Management Committees (VFPMC) are managing 235,634 ha of forest area under Joint Forest Management. Since the first Village Forest Protection and Management Committee (VFPMC) was registered in Eklingpura in Udaipur (South) Forest Division in 1991, State has made a good/substantial progress in community forestry. State is also committed to the sustainable forest management through blending of scientific and indigenous knowledge.

Success of Joint Forest Management demonstrate that vast tracts of degraded forests in Ajmer, Banswara, Chittorgarh, Dungarpur, Jaipur, Jhalawar, Kota, Sirohi and Udaipur can show rapid ecological recovery through community forestry programmes. In most of these districts, secondary species dominate with vigorous coppice growth and rootstock. Human activities causing degradation include very high incidence of repeated grazing and non-regulated over-exploitation for rural fuelwood. Through participatory forest management, communities can take up protection, artificial planting of wood and non-wood bio-mass yielding trees, cleaning of surviving stumps, shoot singling and enrichment planting to enhance productivity of the forest lands. Tribal hamlets in southern Rajasthan comprise a homogeneous group of often less than 125 families and dependence of people on forests for livelihood is high. Minimum requirement for ecological recovery in such area with participatory approach is protection, enrichment planting and seed-sowing; the JFM approach is helping to develop the forest resources (Pandey 1991).

State Forestry Action Programme document of (GOR, 1996) estimates that the total contribution of forestry sector in the state works out to Rs. 7160 million or Rs. 716 crores **(Table 4.3)**. Empirical analysis shows that nearly 60 million mandays are generated in the primary sector for harvesting these forest products.

Table 4.3: Contribution of the forestry to the State Domestic Product in Rajasthan

No.	Product	Value in Rs. (million)	Percent of Total
1	Fuel wood	720	10
2	Fodder	5700	79
3	Timber	340	5
4	NTFP	400	6
Total		**7160**	**100**

Source: GOR (1996)

Under JFM following key activities are given much emphasis:

(a) **Participation:** For the first time in history Forest Department and village community joined hands together under JFM programme for the common cause. Purposes for this initiation were to protect forests both quantitatively and qualitatively and to improve livelihoods. Both people and FD are participating for their rational self-interests bringing good for both the sides.

(b) **Sharing of benefits:** Forest Department has now realized the importance of sharing the forests resources that could only be protected with the involvement of village people.

(c) **Use of indigenous knowledge:** Indigenous practices related to forests provide a variety of products and services to the local communities including water and biomass for subsistence. These practices are essentially "conservation and sustainable use practices" because harvest is much below the accretion that holds the promise for sustainable forest management (Pandey 2001). Under the JFM programme local knowledge of the villagers is being used by the FDs. Use of local knowledge is beneficial for both FDs and villagers as well.

(d) **Area specific planning:** Village Forest Protection and Management Committees (VFPMCs) are formed and registered representing all the adult population of households. A need based and area specific micro-plans are prepared for the development of the village. Activities (including entry-point activities) are carried out in concerned village according to need of the village and members.

(e) **Involvement of women:** Women in rural areas are most dependent on forest lands from where they collect most of the forest produce both for subsistence and sale, therefore, participation of women for forest protection and management is vital and can't be ignored. Shy behaviour of women not to get involve in village affairs hinder their participation which ultimately could be overcome with the help of JFM; this is so because of the fact FD personnel are making sincere efforts for women's participation.

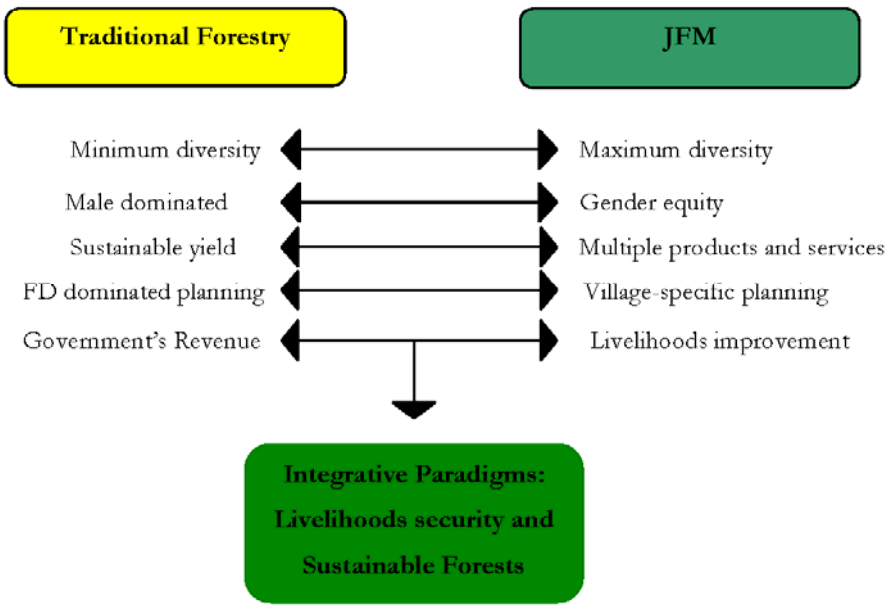

Figure 4.2: Integrative paradigms: Livelihoods security and sustainable forests

4.6 Udaipur

Udaipur has been the seat of Mewar Kingdom after Maharana Udai Singh came down from the northern hills of Chittaur to the valley known as Girwa, where he built two lakes and founded the city of Udaipur during his reign (1541-1572) and made it the capital of Mewar (Pinhey, 1909). Since then, the entire geographical area of Udaipur district was in the Kingdom of Mewar and continued to be regarded as the heartland of Mewar after the Indian independence and merger of States. As per 1991 census, the population of Udaipur is 2.07 million (34%) out of the total population i.e. 5.97 million of Mewar. The historical maps archived in the library of Maharana Mewar (Udaipur) invariably show the name of the Mewar state as "Udaipur" or "Mewar State".

Compared to all four districts in Mewar, Udaipur has the maximum area under forest cover (Table 4.1 and Figure 4.1). Udaipur is the most forested district in Rajasthan. Being centrally located it exhibits the representative ecological, economic, social and historical features of the region.

Udaipur derives its name after the Rana Udai Singh (father of the legendary hero Maharana Pratap) who founded the kingdom in 1559 AD. The present Udaipur city was the capital of erstwhile Princely State of Mewar.

Udaipur district is situated in the southern Rajasthan. It lies between 23° 46' and 26° 2' north latitudes and 73^{0} 0' and 74^{0} 35' east longitudes. Udaipur is bounded on the north by Rajsamand district, on the south by Dungarpur and Banswara, on the east by Chittaurgarh and on the west by Pali and sirohi districts of Rajasthan and Sabar Kantha district of Gujarat.

Although some parts of Rajasthan used to get fair amount of rains every year, but during past few years the rainfall has become very irregular and unpredictable. Average rainfall of the district is 600 mm. In year 2004-05 it was 480 mm only. Temperature, however, remained between 18^{0}C (min) and

35^0C (max.). At times rises upto 45^0C for few days during summer and goes down upto 3^0C in winter.

The Aravali's, one of the oldest mountain systems exist in Udaipur district. These once had dense forest cover in the past but now depleted due to excessive biotic interference. Continued deforestation and soil erosion has converted most of the densely forested hills into barren lands. This has disturbed the ecological balance of the Aravali. This has resulted into the deterioration of environment of the area. Once the area was rich in non-timber forest produce which was good source of income of Tribal community. GUM, Mahua flowers, Mahua seeds, Myrabolams, Karanj, Anwala, Ratanjot and Safed Musli and many other forest produce were in abundance in the area. These were collected by Tribal communities but due to depletion of forest cover the production of these NTFP have decreased to underneath.

Thus, Joint Forest Management has been started for protecting forest and achieving sustainability of the forests. Greater participation implies more chance of livelihoods resources available to village communities.

4.6.1 Why Udaipur as the study area?

In order to conduct field study, four VFPMCs of Udaipur in Rajasthan were chosen. Reasons for choosing Udaipur as a study area were as follows:

- VFPMCs in Rajasthan were initiated in Udaipur: First VFPMC in Rajasthan was instituted in Eklingpura village in year 1991 which is under Udaipur South division.

- Distance from forests is clearly quantifiable: Chosen VFPMCs are situated nearly 1-2 kilometers from forests.

- As there are some studies available on different aspects of JFM in Rajasthan these provided a good discussion material for the study (see

for example, Pandey 1991 & 1996, Süss 1995, Süss and Seeland 1996, Kinhal and Narayan 1994, Datta 2001, Conroy 2001, Jain 2002, Kashwan 2003, Sriram and Parhi 2004, Negi *et al.* 2004, Pandey 2004).

The basis of selection of village forest protection and management committees was on the basis of age and distance from the forests. As the key objective of the study were to design the livelihoods monitoring tools, it was useful to test these tools in villages where a diversity of JFM activities have been carried out and the VFPMCs have been active for a long time. The expression "diversity of JFM activities" means:

i. Forestry works (planting, direct sowing, soil and water conservation etc.)

ii. Societal activities (constitution of VFPMcs, meetings, women's committees/meetings, micro-credit, group building etc.)

iii. Entry-point activities (check dams, anicuts, irrigation facilities, wells, roads, health facilities and educational facilities etc.)

Four VFPMCs in Udaipur, Rajasthan were selected based on the literature and on the basis of recommendations by the practitioners and forest department to test the tools and understand the impacts of JFM on the rural livelihoods. Four VFPMCs chosen for field study were Ambua, Keli, Nayaguda and Nayakheda which were within 1-2 km from forests.

These VFPMCs also have been selected for the study and field test of monitoring tool because they are among the first few JFM institutions which are widely perceived to be successful among FD and local NGOs. However, a less successful case has also been included. The fact that the performance of VFPMCs in terms of livelihoods impact is not often known necessaciates an analysis of the few cases of successful VFPMs with widely perceived positive impacts on livelihoods.

4.6.2 Sample villages to test the monitoring tool

Whenever a company or organization is interested in introducing a new product in the market, it generally does not launch its product without testing the prototype. Otherwise, it may be a costly business. The company also does not disseminate the product everywhere without pre-testing the product. Keeping this basic managerial logic in mind, and to check the validity and viability of the tools, the livelihoods monitoring tools were tested in four VFPMCs of Udaipur, Rajasthan. The tool testing process has given a fair idea about the applicability and usefulness of the monitoring tools.

Identified indicators related to different livelihoods capitals were found to be useful to give a fair idea about the status of livelihoods in villages. However, data on a few indicators was unavailable as there has been no practice of collecting such data by the FD. Also, in some instances data compilation practice by the FD or VFPMC presidents needs lot of improvement.

4.6.2.1 Ambua

Ambua, which have area of 1437 hectare, is situated 18 kms away from Udaipur near Umarda railway station. It has 200 hectare of JFM plantation. Total population of this village is 1180 and households are 140. Proportion of the ST/SC population is 97% of the total population. Literacy rate is extremely low here, only 2% of women and 9% of men are literate. 119 households are dependent on daily wages and 21 are dependent on partial wages (Micro plan Ambua). There are 128 marginal farmers and 12 households are landless.

Local village institution for making JFM operational is the VFPMC established according to Govt. order dated March 15, 1991 in year 1992. Entry-point activities/developmental activities includes two anicuts, road construction, two pulia (small bridge), digging up of four hand pumps, two medical camps, two community chabutra and a community hall. NTFPs which villagers collect

from forests includes Tendu patta, Kachri, Ratanjot (used for oil and soaps), Buhari grass (used for broom), Tinda (vegetable), Mahua and Gum for local use. Grass is sold and gifted to relatives on a large scale in Ambua village and this is one of the main sources of income and building social networks. Many of these activities have been done in conjunction with the World Food Programme of the FD.

Major crops are Maize, Udad and Til which are entirely dependent on rainfall. Area of irrigated land is 20 ha, non-irrigated land is 171 ha, forestland is 1197 ha and non-agricultural land is 49 ha

Ambua is located close to forest block called Raniji Ka Beed which is close to Kewda ki Nal forest block. Forests in the vicinity are degraded though some of the areas have good forest of 0.3 to 0.4 canopy density. Vegetation includes Aam *Mangifera indica*, Mahua *Madhuca indica*, Ber *Zizyphus mauritiana*, Khajur *Phoenix sylvestris*, Khakhra *Butea monosperma*, Imli *Tamarindus indica*, Jamun *Syzygium cuminii*, Tendu *Diospyros melanoxylon*, Bad *Ficus benghalensis*, Pipal *Ficus religiosa*, Bamboo *Dendrocalamus strictus*, Godal *Lannea coromandelica*, Neem *Azadirachta indica*, Rohan *Soymida febrifuga*, Karanj *Derris indica* and Sitaphal *Annona squamosa* etc. Shrubs include Negad *Vitex negundo*, Awanl *Cassia auriculata* and Jharberi *Zizyphus nummularia*. People also graze their cattle in the forests, collect fodder by cutting grass and lopping of tree branches (Pandey 1996).

An obvious result of overuse of resources was scarcity of fodder and livelihood goods. People felt the need to regenerate their forests and some of them approached the forest department with their problem. A few years ago families use to collect *Dhavra* and *Kadaya* gum and sold it in local market, however, depleting forest yielded less and less of such products. About 80 families were earlier involved in green felling and wood was transported on camel-back to Udaipur. Villagers feel this was the most depletive practice to forests. Economy of people is dependent on several others trees, such as

making and selling of mats from *Khajur* leaves, *Pattal* (Plate) from *Khakhra* leaves, collection of *Tendu patta*, and *mahua* flowers and seeds during summer.

First plantation was carried out in the year 1992 on 50 ha of lands. Area falls on gently undulating land sandwiched between human settlements along hills running parallel to their settlement. People had suggested in the microplan that if lower reaches of hillock are protected, tree-bearing upper slopes will automatically get protected. Thus, since 1992, more than 300 ha of plantation have been carried out. Plantation not only provided employment to the people but also enhance the productivity of wastelands. This provided people employment who otherwise might have continued with illicit felling of trees and its sale in nearby market. Plantations have yielded lot of grass. Camel owning families have now switched over to collection of their share of grass, its transport to local market on camel-back and its sale. They also get additional revenue by transporting grass of other families who do not own a camel, but still have surplus grass to be sold for additional income. On an average, one camel owning family earns about Rs 100/- a day for 80-120 days in a year (Pandey 1996).

VFPMC Ambua has also received the highest state honor given by the Govt. of Rajasthan for their work. The award known as Amrata Devi Visnoi Award was given in 1998 (Rs. 50000/-) for the work on JFM.

4.6.2.2 Nayakheda

Nayakheda, with geographical area of 470 ha, is situated 31 km away from Udaipur on the way to Jhadol. It has an area of 470 ha under JFM plantation. Irrigated agricultural land is only 6 ha while non-irrigated land is 51 ha Total population of the village is 1240 and number of households is 175 (out of which 370 are VFPMC members). Proportion of ST is 97% of the total population.

VFPMC was done on May 1995 under the provisions of the Govt. order dated March 15, 1991. Enrty-point activities/developmental activities undertaken in the village include three anicuts, road construction, setting up of two hand pumps, two medical camps, community chabutra, and waiting place for villagers. NTFPs being collected by villagers include Amla, Safed Musli (medicinal plant), Ratanjot (used for oil and soap), Buhari grass (used for broom), Honey, Tinda (vegetable) and Gum for local use.

Nayakheda committee also got honor of Amrita Devi Visnoi Award of Rs. 50,000 cash and a certificate in the year 1999 for conservation and development of forests.

4.6.2.3 Keli

Village Keli, which have area of 414 hectare, is located in West direction and is 15 km away from Alsigarh bus stand on the Udaipur-Jhadol road. Maximum temperature that the village attains is 43^0C to 46^0C and minimum temperature is 1^0C. It has area of 200 ha under JFM plantation. Irrigated agricultural land is only 5 ha while non-irrigated land is 21 ha Total population of the village is 400 and number of households is 70, out of which 225 are VFPMC members. Proportion of ST is 100% in this village and 100% population is dependent on daily wages.

VFPMC in Keli village was constituted according to the Govt. order March 15, 1991 on June 29, 1998. Entry-point activities/developmental activities include two anicuts, two hand pumps, two pulia, three kms road, chabutra and a flour mill. Needs related to forest produce are fodder, grass, bamboo, thorny scrubs for boundary.

Sources of Income in this village are mainly the daily wages. One interesting fact here is the self-help group (SHG) of the VFPMC that provides loan to members for the purpose like marriage and daily routine works.

4.6.2.4 Nayaguda

Village Nayaguda (Talai hamlet) has an area of 175 ha It is located on way from Udaipur to Kodiyat, about 12 kms away from Udaipur. Irrigated land is only 2 ha while non- irrigated land is 12 ha Total population of Nayaguda village is 284 and proportion of SC is 99.3%, rest 0.7% is constituted by others. Population is mainly dependent on daily wages, particularly low-skilled works as the literacy rate is as low as 11.26%.

Major crops are corn, wheat and mustard etc. One interesting fact here is that to protect soil erosion Ratanjot plantation have been done. This plantation helps in two ways first in reducing soil erosion and other in providing additional income to the villagers. Additional income comes by selling and consuming Ratanjot in the form of bitter oil and soaps. Seeds are also collected and sold in this village for species like, Kher, Desi babool, Neem, Palash, Kadaj, Aradu and Kumtha etc.

Table 4.4: Awards to VFPMCs

S No.	Name of VFPMCs	Period	Award Distribution Agency	Details of Award	Concern Subject	Award
1.	Ambua, Udaipur	1998	Govt. of Raj.	Amrita Devi Visnoi Prize	For conservation & development of forests	Rs. 50,000 cash & Certificate
2.	Nayakheda, Udaipur	1999	Govt. of Raj.	Amrita Devi Visnoi Prize	For conservation & development of forests	Rs. 50,000 cash & Certificate
3.	Kevara, Udaipur	2000	Govt. of Raj.	Amrita Devi Visnoi Prize	For conservation & development of forests	Rs. 50,000 cash & Certificate
4.	Jhangari, Kherwara	2004	Seva Mandir, Udaipur	Ummedmal Lodha Memerial Environment	For Forest protection & Watershed Development works	Rs. 50,000 cash & Certificate
5.	Gawarapal, Salumber	2004	Distt. Collector, Udaipur	Independence Day Award	For Forest protection & Development	Certificate
6.	Popalty, Udaipur	2005	Distt. Collector, Udaipur	Republic Day Award	For Forest protection & Development	Certificate

Chapter 5

Methods of data collection for monitoring tools

Data had been collected by using both secondary sources and primary field survey for monitoring tools. Secondary sources include literature review from various journals, FD records, and village records. Primary sources include semi-structured interviews with key informants, structured indicators' information for tools, group discussion and observation. Using secondary and primary sources simultaneously is necessary as it provides opportunity to integrate the before- and after-JFM situations. It also provided the background material for the study.

5.1 Secondary data sources

Secondary sources are those which are already available to the researchers for consultation. Secondary sources include literature from various journals, research reports, FD records, and village records.

5.1.1 Forest Department records

Forest Department records have been used to collect useful information on indicators related to forests. For example, number of VFPMCs, FD wages/ capita, area under JFM, area under NTFPs, proportion of adult population participating in VFPMCs, proportion of VFPMC members that are women, number of VFPMC meetings and attendance, and number of SHGs in the village. Micro plans proved beneficial for the study in getting basic information about the village. The micro plan document provided many of the required information about village profile such as location of the village, population, infrastructure available to the households/ village, sources of

income available to villagers, education level, socio-economic condition, agricultural land and irrigation facilities etc.

5.1.2 Village records

Village records are often maintained by Patwari and village head. Patwari provided information about village infrastructure, condition of houses and land records. For example, information on indicators like number of pukka houses, number of houses with electricity, infant mortality rate was provided by patwari (but it required verification on the ground as far as possible). Information related to schools/education status was provided by school teacher. Information related to medical condition was collected from villagers and VFPMC president because of the unavailability of dispensaries.

5.2 Primary data collection

Primary sources are those which are used to collect the data by researcher/ user himself for use. Primary sources include semi-structured interviews with key informants, structured discussion on information about specific indicators, group discussion and observation.

5.2.1 Group discussion

Information collected with the help of GDs proved beneficial because it saved villagers valuable time and researchers' cost/ time. For the Perception analysis tool it was of great help. GD was conducted with 5-6 members at a time present in the meeting and an answer received from any member got reviewed/ verified by other members present in the same group. GDs helped to cross check the required information. VFPMC president also as key informant helped in cross checking the answers. Usual discussion initiation involved the questions such as:

- What were activities and facilities provided by FD?
- Your reasons for happiness from VFPMC? What were the ways you think JFM helped you to improve your livelihoods?
- Number of people that worked outside village on a daily basis etc.

5.2.2 Semi- structured interview with key informants

Semi-structured interviews were conducted with FD personnel hierarchy right from CCFs to cattle guards for both the monitoring tools. Semi-structured interviews were organized so as to get information needed according to the tools and to collect any missing information that could not become available from personnel.

5.2.3 Observation

Observations were used to find answers to major questions required to understand the impacts of JFM on the livelihoods. Questions like:

- Were VFPMC members comfortable in communicating with the FD or others related to JFM?
- Their attitude towards JFM?
- Average traveled time to nearest market?

5.2.4 Limitations of field-testing the monitoring tools

1. Lack of holistic approach of the stakeholders towards JFM

Personnel often took the study (i.e. the field testing of the monitoring tool) as one directed towards studying the JFM process and not as its impact on the rural livelihoods. This required large efforts to bring them on track again and again.

2. *Non-conducive time for the specific indicators based research*

Summer vacations and the ongoing wedding season were not conducive for collecting data on indicators, for example, from school records. It was also not possible to meet all the VFPMC members at a time. Numerous attempts were needed to get the correct information.

3. *Improper records compilation*

Data on the indicators like segregation of JFM area, NTFPs area or area of fruit-tree plantation were not made available by the FD on grounds of non-availability of disaggregated information. Information about the total money spent in the village was not available for the study purpose despite numerous attempts. Perhaps, this limitation could have been overcome if the monitoring was being done by the FD team themselves.

4. *Lack of leadership quality and shy behaviour of women*

Women members apparently lacked leadership initiatives and felt shy in giving answers. But, some of the women were co-operative and were willing to share everything they knew while some hesitated in uttering even a single word. It has been opined that if a women is present in the team it is easier to encourage them to talk. This study did not find this to be the case. Women in the study area require lot of time to open up even to teams with women as members.

5. *Lack of participation in meetings and low attendance*

Attendance was only 40-45% and participation was also not up to the mark. Only few members took interest in communicating directly. Others looked on. They generally spoke to their neighbour to say something but when specifically requested and encouraged to share information with the researcher they just smiled and smiled shyly again and again. Perhaps, spending long time and making numerous visits to villages may help overcoming the inhibition.

Chapter 6

Results and discussion

6.1 Operational aspects of monitoring tools

On the basis of indicators reviewed from stakeholders among the peers, certain suggestions came which were incorporated in the study to make it more clear and simple. Indicators were also changed on the basis of observation after visiting study sites and meeting with VFPMC members and FD personnel. **Table 6.1** given below contains capital assets, indicators, suggested changes, reasons for change and data collection methods for these indicators.

Table 6.1: Results of the review of the indicators by stakeholders and suggested changes

Capital	Indicators	Suggested Change	Remarks on Data Collection
Financial Assets	1. Wages/capita from forestry works (3 year rolling average)	No change	Neither the FD nor VFPMC president were able to provide data
	2. Forest revenue/capita (3 year rolling average)	Revenue from forest produce to VFPMC	Neither the FD nor villagers were able to provide data. Information on this indicator would require detailed survey. FD doesn't maintain any record, because NTFP collection and sale is the duty of Tribal Cooperative Federation, which doesn't maintain village-wise records. Villagers have data only on revenue to VFPMC & households from grass collection.
	3. Number of kiosks selling consumer goods	No change	Data easily available from kiosks
	4. Average price of 5 most expensive items	No change	Data easily available from kiosks

Capital	Indicators	Suggested Change	Remarks on Data Collection
Physical Assets	1. Number of pukka houses/capita	No change	Data available with Members/Chair of the VFPMC
	2. Number of houses with electrical service/capita	No change	Data available with Members/Chair of the VFPMC
	3. Number of motorcycles/capita	No change	Data available with Members/Chair of the VFPMC
	4. Number of Functioning wells/capita	No change	Data available with Members/Chair of the VFPMC
	5. Average travel time(or cost?) to nearest market	Average travel time & cost can be treated as separate indicators	Both time & cost indicators should be taken separately, because cost is important for calculation of net profits. Similarly, if more time is spent on travel, they cannot get time for other productive activities.
	6. Area of irrigated land/capita	No change	Data available from the records of Micro Plan/Village Patwari (frontline revenue official)
	7. Number of functioning tractors/capita	No change	Data available with Members/Chair of the VFPMC
	8. Number of functioning water pumps/capita	No change	Data available with Members/Chair of the VFPMC
Natural Assets	1. Standing volume of timber/capita	As per remarks	We had to drop this indicator because there was no Timber harvesting in our study area.
	2. Area of productive fruit tree plantation/capita	We have tested the indicator for fruit tree plantations medicinal herbs	There is no exclusive plantation for medicinal herbs or fruit trees. Villagers collect from the forest within their village boundaries and sell individually
	3. Area of key NTFP/capita	As per remarks	The plantations are of mixed species and as such it is not possible to get information of any particular species/NTFPs area
	4. Number of livestock (in cattle equivalents)/ capita	No change	Data available from the records of Micro Plan
	5. Average time spent collecting fuel wood per household per month	As per remarks	We found it useful to ask for time consumed to collect fuel wood on head-load basis and no. of visits being made for collecting fuel wood per month. Answers for this question are always found to be uncertain, such as 3-5 hours per day
	6. Average time spent collecting water per household per month	As per remarks	Answers for this question also are always found to be uncertain, such as 1- 1½ hours a day. It is difficult to convert this data on monthly basis.

Capital	Indicators	Suggested Change	Remarks on Data Collection
	7. Value of annual timber production (3 year rolling average)/capita?	As per remarks	We could not tested this indicator because there are growing plantations in the study area.
	8. Value of annual firewood production/capita	As per remarks	It is difficult to obtain. People withhold information for fear of disclosing the illegal activity. This may require computing the full quantity of each household.
	9. Value of annual NTFP (nationalized NTFPs) production/capita	As per remarks	We committed a mistake of not asking the FD about the value of timru pana (tendu patta). We have come to know that this information is easily available.
	10. Annual rice production (kg.)/capita	Changed to "Annual production of major crop(kg)/capita"	Quantity is often told in terms of boris (a sack containing 80-100 kg) and respondents also faced the problem in recalling the total production
Human capital	1. Infant mortality rate	No change	Since these villages have no Public Health Centre, data collected from the villagers is approximate
	2. Number of deaths during dry season/1000	No change	More or less overlaps with the above indicator. No records are available with the village head.
	3. Percentage of school age children attending school	No change	Due to summer vacation, data could be collected from the villagers only on approximate terms.
	4. Average age of school leaving	No change	Due to summer vacation, data could be collected from the villagers only on approximate terms.
	5. Number of people that work outside village on a daily basis per capita	No change	Data is easily available
	6. Number of people that leave village to work outside for extended periods per capita	No change	Data is easily available
Social capital	1. Proportion of adult population participating in VFMPC	All indicators worked well. However, there can be two additions as we have written in the introduction above.	
	2. Proportion of VFMPC members that are women		
	3. Number of VFMPC meetings and attendance		
	4. Number of other citizens' groups active in the village		

Capital	Indicators	Suggested Change	Remarks on Data Collection
	5. Collective selling of agricultural or forest products results in improved prices (y/n)		
		Attitude of villagers towards forests considering as their asset has improved? (yes / no)	

Note: Original list of indicators has been taken from Belcher (2005)

6.2 Present status of livelihoods in selected villages

Monitoring tool was prepared to collect information and know the present condition of the five capital assets. In the field survey, information on each indicator was collected to understand the condition of the village, available resources, and their impact on rural livelihoods after the implementation of JFM, the available infrastructures in the village, and so on.

Figure 6.1 depicts the summary of rural livelihoods in all the field sites separately comprising five capital assets. Scores have been added for all the capital assets (calculation of scores have been explained in legends attached to the figures.

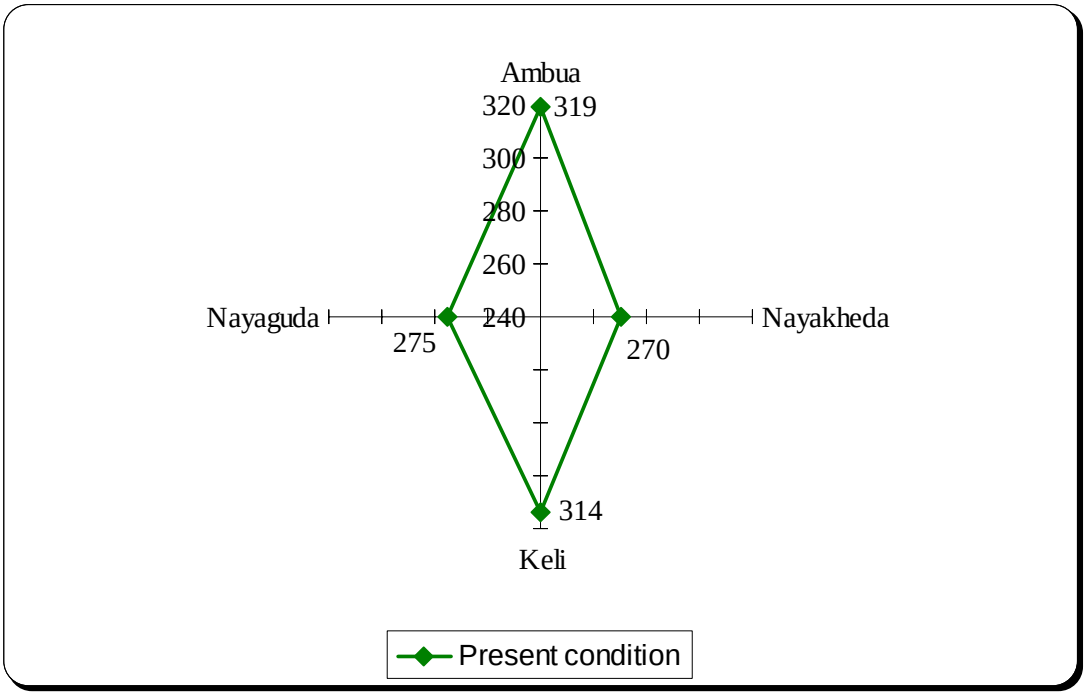

Figure 6.1: Present status of livelihoods in JFM sample villages. *Scale shows the cumulative score of all the capitals. These scores have been calculated for each indicator of different capitals and by adding up scores for all the capitals in a sample village.*

Table 6.2 Helps us understand the condition of livelihoods in the four VFPMCs Ambua, Nayaguda, Keli and Nayakheda. Capital wise data for each indicator is given in the table 6.2 for the year 2005. Blank cells in the table show the non availability of the data for some indicators.

Table 6.2: Present status of livelihoods in sample villages

Capital	Indicator	Survey 2005 in the villages			
		Ambua	Nayakheda	Keli	Nayaguda
Financial Capital	1. Wages/capita from forestry works (3 yrs. average in Rs.)				
	2. Total money deposited in VFPMC in a year (In Rs.)	1,80,000	1,42,000	144096	37000
	3. Money deposited in the a/c of VFPMC (No.of times in a year)	Occasional (1-5 Times)	Occasional (1-5 Times)	Occasional (1-5 Times)	Occasional (1-5 Times)
	4. No. of shops selling consumer goods	4	3	2	3
	5. Average price of 3 most expensive items in shops (in Rs.) 1	146	60	35	55
Physical Capital	6. No. of Pukka houses/capita	0.03	0.048	0.0025	0.017
	7. No. of houses with electric service per capita	0	0	0	0
	8. No. of Motorcycles/ capita	0.04	0.0096	0	0.01
	9. Average travel time to nearest market (In hours)	1.25	1.25	6	1
	10. Area of irrigated land/capita (In hectare)	0.017	0.0048	0.0125	0.007
	11. No. of functioning Tractors/capita	0.0017	0.0008	0	0
	12. No. of functioning Water Pumps/capita	0.013	0.0008	0.0075	0.0246
Natural Capital	13. Area of JFM plantation/capita (In hectare)	0.17	0.32	0.05	
	14. Area of key NTFP/capita (In hectare)[2]	0.17	0.32	0.05	
	15. Average time spent collecting fuelwood per household per week (In hours)	7	10.5	10.5	21
	16. Average time spent collecting water per household per week (In hours)	3.5	7	7.5	17.5
	17. Average time spent collecting fodder/household per week (In hours)	7	21	7	1.5
	18. Value of annual Bamboo production/capita[3]				
	19. Value of annual firewood production/capita[4]				
	20. Value of annual NTFP production/capita[4]				
	21. Annual food-grain production/capita[5]				

Capital	Indicator	Survey 2005 in the villages			
		Ambua	Nayakheda	Keli	Nayaguda
Human Capital	22. Infant mortality rate	80-85			
	23. Percentage of school age children attending school	40	70	80	90
	24. Average age of school leaving	13	13	12-13	12
	25. No. of people that work outside village on a daily basis per capita[6]	0.17	0.036	0.0225	0.025
	26. No. of people that distress migrate from village to work outside for long periods/ capita	0.008	0.0145	0.015	0
Social Capital	27. Percentage of adult population participating in VFMPC	100%	100%	60%	60%
	28. Percentage of VFMPC members that are women	50%	50%	50%	50%
	29. No. of VFPMC meetings in a year	8-10	8-10	8-9	7-8
	30. Attendance of VFPMC members in meetings (In percent)	25%	30%	40%	25%
	31. Microcredit/self-help groups (SHGs) in village (y/n)	Yes, 2	No, 0	Yes, 2	No, 0
	32. Collective selling of agricultural or forest products results in improved prices (y/n)	No	No	No	No
	33. Proportion of total SC/ST population participating in VFPMC	97%	97%	100%	99%

[1] *Average price of Ghee (@ 250/ kg), Tea leaf (@ 100/ kg) and Mustard oil (@ 60/kg)*
[2] *NTFP plantation areas are not separated from JFM plantation area.*
[3] *In our sample villages' bamboos are not being cut as bamboo plants are small.*
[4] *We could not get the data as forest department does not maintain records regarding this indicator because fuel wood and NTFP's are collected by villagers.*
[5] *We could not get this data because villagers were unable to recall the actual production of food grain. Apart from this forest department does not maintain records for the same.*
[6] *We are talking only about those persons who have uncertainty in getting job on daily basis. That is why; we assume if less no of people work outside village, it will be better for the village.*

6.3 Status of livelihoods pre-and-post JFM

Data collected with the help of perception analysis tool is shown in table 6.3. The table shows the village wise and capital wise condition of capitals before and after implementation of JFM in these villages. The table will facilitate to understand the about the present status of capitals in sample villages.

Table 6.3: Distribution of capital assets across villages in Udaipur

Villages	Financial Capital		Physical Capital		Natural Capital		Human Capital		Social Capital		Village wise cumulative capital	
	Before	After	Before	After	Before	After	Before	After	Before	After	Before	After
Ambua	35	70	30	45	59	89	31	40	45	75	200	319
Nayakheda	30	60	30	35	56	55	34	40	45	80	195	270
Keli	35	55	35	40	44	79	45	50	55	90	214	314
Nayaguda	30	55	35	45	65	45	45	50	45	80	220	275
Capital wise cumulative score	130	240	130	165	224	268	155	180	190	325		

Note: Score in the above table 6.3 has been calculated on the basis of considered three situations, best, moderate and worst for each of the indicators. These situations carry 3, 2 and 1 scores respectively. Scores were calculated by multiplying the number of respondents voting for a particular situation (best, moderate and worst) with score allocated to the situation. See Annex. 1 for more on scoring method.

6.4 Impact of joint forest management on rural livelihoods

Figure 6.1 depicts the capital wise cumulative scores of all five capital assets. It clearly indicates that there is a significant increase in financial capital of all the four villages.

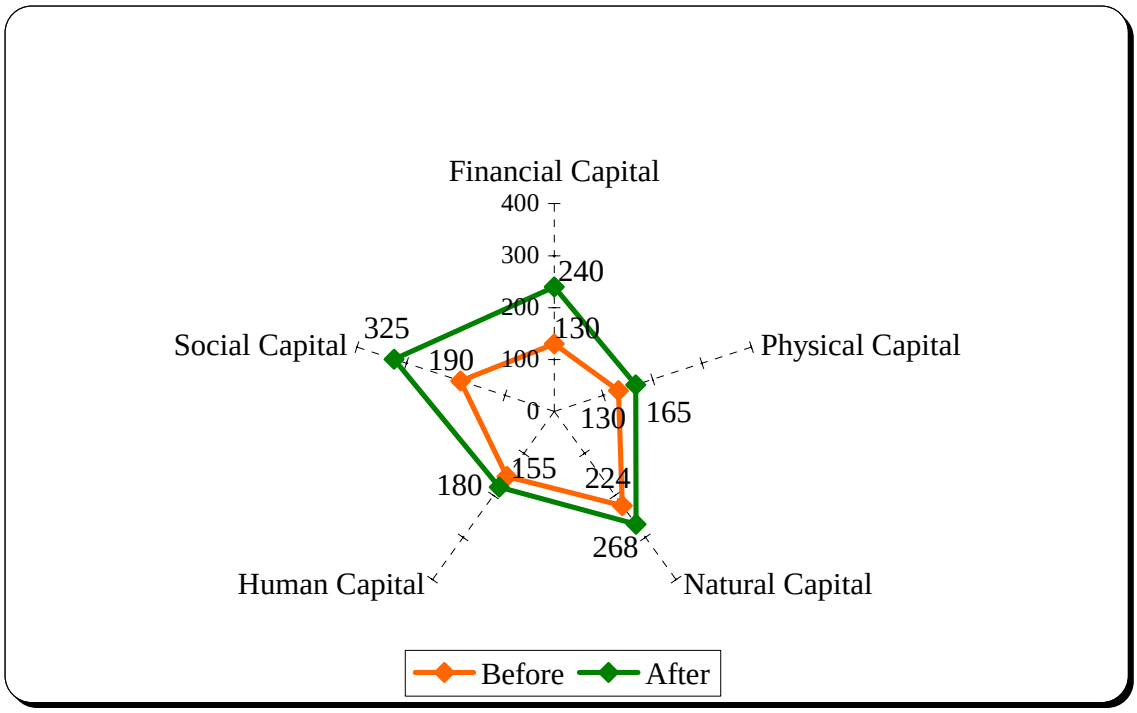

Figure 6.2: Status of Livelihoods before and after the implementation of JFM in Udaipur. *Status of five capitals before (inner line) and after (outer line) the implementation of JFM in sample villages. Scale shows the cumulative scores of all the capitals calculated separately for before-and-after JFM implementation by adding all the scores of five capitals in sample villages. To calculate the scores number of respondent opted for that situation was multiplied by marks allotted to that situation.*

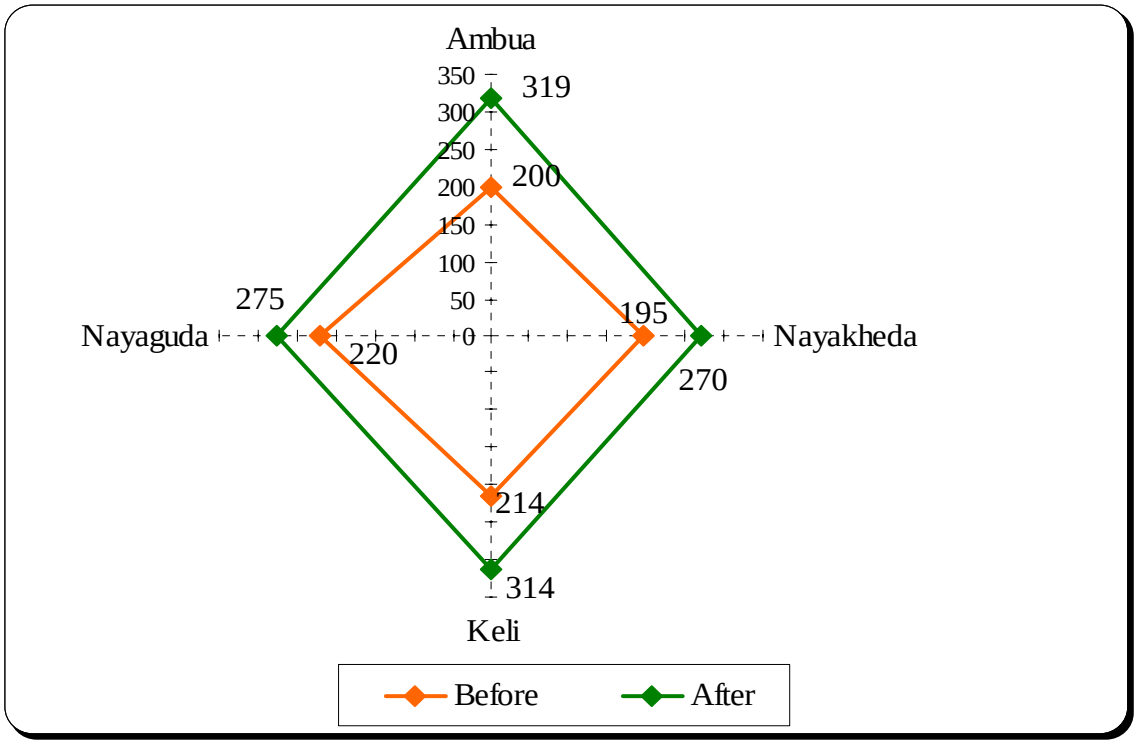

Figure 6.3: Status of Livelihoods before and after the implementation of JFM in Udaipur. *Village wise cumulative scores depicting the status of livelihoods before (inner line) and after (outer line) JFM in sample villages. Scale shows the cumulative scores of all the capitals calculated separately for before-and-after JFM implementation by adding all the scores of five capitals in sample villages.*

6.4.1 Financial capital

Scores for financial capital before and after JFM implementation is 130 and 240 respectively. The reasons for this progress in scores may include:

1. The increase in the daily wages given by the forest department to the village workers (at present the FD gives, Rs. 73 out of which it deducts Rs. 10 and give workers 2,500 grams of wheat and 200 grams of pulses and rest Rs. 63 in cash);

2. Development of entrepreneurial skills among villagers (FD provides training and facilities so that members can earn additional money through activities like cloths sewing, broom making);

3. Increased availability of grass in the village itself is one of the important reasons for increase in Financial capital;

4. In all the villages famine work is carried out by the FD during scarcity months (Dec- July) to provide additional work as well as daily wages to the villagers. Famine works include maintenance of pulia (small culvert), maintenance and construction of annicut, maintenance and construction of kuchha road in their village, maintenance and building boundary wall in periphery of the plantation area etc.

5. As the FD is ready to lend a helping hand in reducing the distress migration from the villages by providing job opportunities within the village, it also enhanced the score for the capital.

6.4.2 Physical capital

The cumulative score for physical capital before JFM is 130 and after implementing JFM it has risen to 165. There is a direct relationship between physical capital and financial capital in a sense that more money is now available to spend in building physical assets. In the earlier section (section 6.4.1) reasons for the increase in financial capital have been explained but this increase has not been enough to improve the physical capital in same proportion. Nevertheless, it is still helpful to some extent. Income level of the villagers is not such that they can make their house pukka in one phase or purchase a motorcycles, tractors or water pumps. But, they may be able to do all this in the long run. Even now, when economy is booming in some areas, villagers have to spend more money and time to reach to their nearest market for purchasing goods. This is so because of the non-availability of the good roads and lack of connectivity to the cities.

6.4.3 Natural capital

It is a known fact that one of the objectives of JFM, apart from improving livelihoods, is to protect, regenerate and manage the forests. Better managed forests shall be more useful for environment as well as to villagers and FD (who can obtain more timber and NTFPs than what they used to get before JFM was implemented). The cumulative scores of this capital before and after JFM is 224 and 268 respectively. It is expected that due to the collaborative efforts of the FD and VFPMCs the scores for indicators may increase substantially. But this is not the case, and there is only a marginal increase in the scores of indicators in before and after JFM scenarios. Despite all the effort made by the VFPMCs, natural capital has improved only marginally, probably because of the drought years (scarce rainfall) in Udaipur, Rajasthan in last five years. Monsoon variability has profound implications for the sustainable livelihoods of rural communities in India (Pandey 2005). If we assume that there will be good monsoon rains the natural capital may increase significantly not only in sample villages, but also, throughout the Rajasthan where JFM has been implemented.

6.4.4 Human capital

The cumulative scores in the livelihoods indicators of human capital increased in all of the sample villages. The scores for human capital increased from 155 to 180 after implementing the JFM. Some reasons for improvement in the scores include the reduction in infant mortality rate, improvement in percentage of school age children attending school etc. There are some indicators and factors which have a negative effect on the scores (for example, distress migration from the villages on daily basis).

6.4.5 Social capital

The cumulative scores of social capital after implementing the JFM increased to large extent in all the sample villages of Udaipur. Before JFM, the

cumulative score of the social capital was 190 points which has increased 135 points to become 325 now. About six to eight VFPMCs meetings in a year provide villagers a platform to communicate and interact with each other. One of the interesting facts of the VFPMCs is that women's participation is encouraged in the meetings. Gender equity gives chance to women to participate in village affairs and also, provide diverse inputs and contribution for the development of the village. Sustainable development should, therefore, pay attention to the profound influence that gender economics has in any collective attempt to build a sustainable society (Pandey 2002a). Indeed, in shaping a sustainable society, creative strength of 50% of the India's population cannot be ignored (Pandey 2002b). It further enhances the understanding among the villagers, and in turn, each person knows village's assets. Assets in the form of skills and knowledge are used for the development of the village. Besides discussions on forests related topics at this platform, they also consider each others problems and try to solve them. Problems include worries related to child, home, social and financial aspects.

It should be noted, however, that although meetings are arranged frequently, the participation in the meetings is low. In all the field sites, attendance falls in the category of only 25%-40%.

Out of four sampled villages only two villages have self- help groups. One of the major reasons of not getting good prices for their products is that they make no collective efforts to sell their agricultural and forest products. Selling crop and forest products individually, low attendance and small number of micro credit are the obstacles in limiting the further improvement in the social capital.

Table 6.4: Percentage change in capital scores in pre and post JFM condition

Capitals	Villages			
	Ambua	**Nayakheda**	**Keli**	**Nayaguda**
Financial Capital	100%	100%	57.14%	83.33%
Physical Capital	50%	16.66%	14.28%	28.57%
Natural Capital	50.84%	-1.78%	79.54%	-30.76%
Human Capital	20.03%	17.64%	11.11%	11.11%

To get a more clear picture of changes in capital assets the percentage change have been calculated (from the table 6.3) for situations before- and after-JFM . Village Ambua scores better than other three villages in terms of overall impact (**Table 6.4**). Financial capital of Ambua and Nayakheda has increased by 100%. In physical capital also Ambua has the maximum (50%) growth rate (**Table 6.4**).

In Natural capital Ambua and Keli have a positive growth rate while Nayakheda and Nayaguda have a negative growth rate of 1.78% and 30.76% respectively. Some of the reasons for the negative growth rate are uncertainty in monsoon, very less rainfall and continuous increase in demand for fuel wood. Another reason according to one of the forest department official's observation is the improper selection of plants by the forest department officials sometimes.

Human capital of all the villages has increased. Ambua and Nayakheda have a growth rate of just 20.03% and 17.64% respectively and Keli and Nayaguda have a growth rate of 11.11% each. The impact of JFM on human capital is comparatively less perhaps because more efforts are needed to improve the human capital. For example, to reduce the distress migration, the forest department is making large efforts to provide work in villages itself. But only few activities are being organized which can improve the health, education and living standard of the villagers.

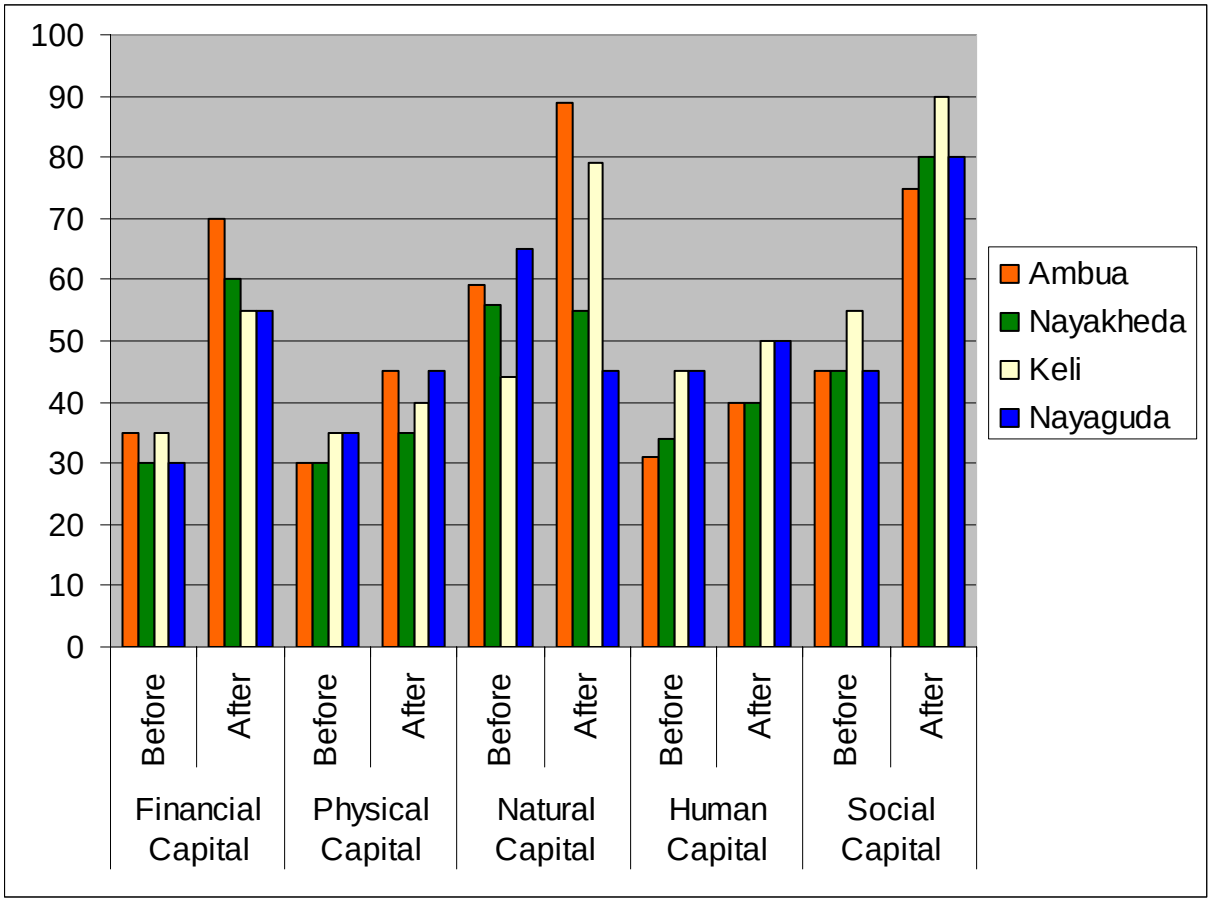

Figure 6.4: Comparison of all the capital assets pre-and-post JFM condition

Social capital of all the villages has increased remarkably. Percentage increase in Social capital for Ambua, Nayakheda, Keli and Nayaguda are 66.7%, 77.8%, 63.7% and 77.8% respectively. Scores for Social capital have improved because of participating in meetings 7-8 times in a year. VFPMC meetings and seminars provide opportunity to the villagers to meet and interact with each other. In meetings they discuss various issues including personal ones. It improves understanding among the villagers. Women also participate in the meetings willingly (but see challenges related to small attendance noted earlier in this section).

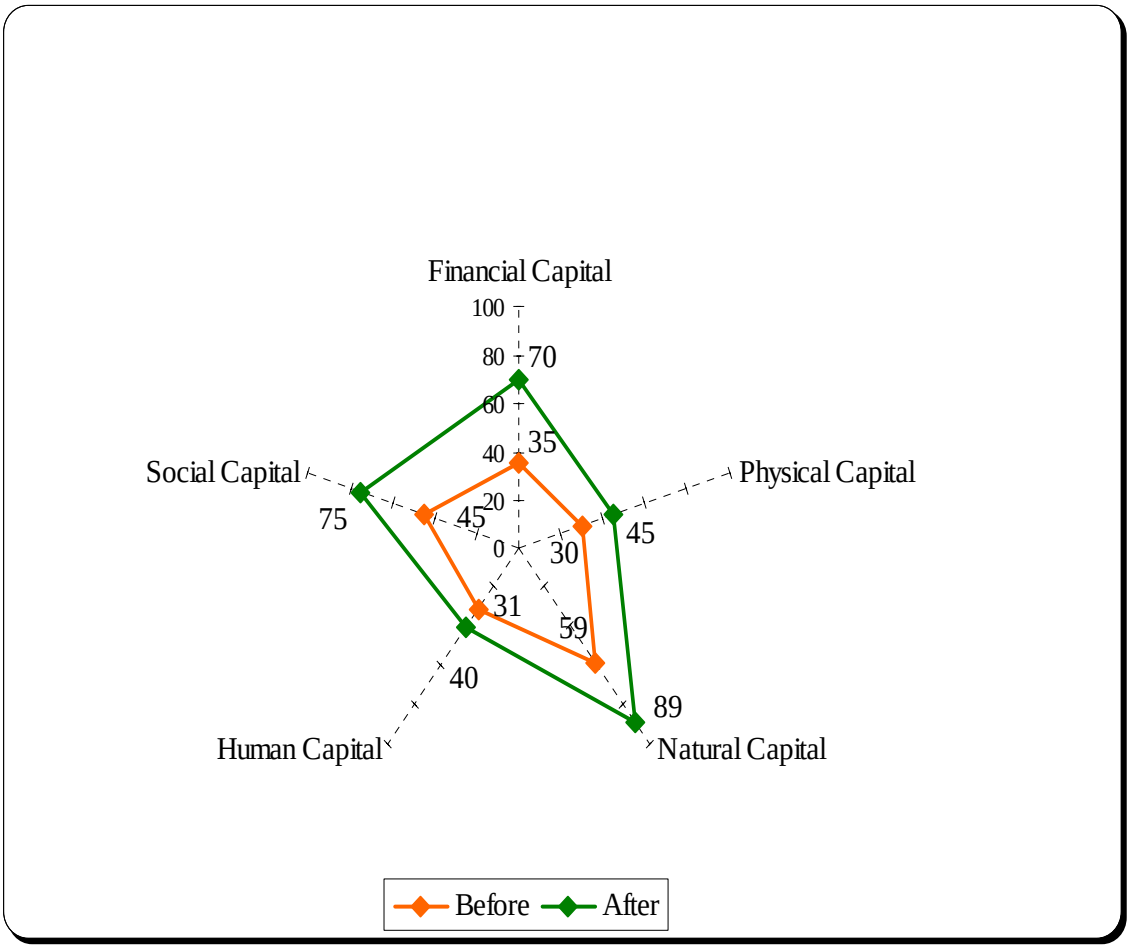

Figure 6.5 Status of livelihoods before and after the implementation of JFM in Ambua. *Scale shows the cumulative scores of all the capitals calculated separately for before-and-after JFM implementation by summing up all the scores of five capitals in the sample villages. Scores have been calculated on the basis of considered three situations, best, moderate and worst for each of the indicators. These situations were given 3, 2 and 1 score points respectively (see Table 3.2). To calculate the scores number of respondent opted for that situation was multiplied by score allotted to that situation.*

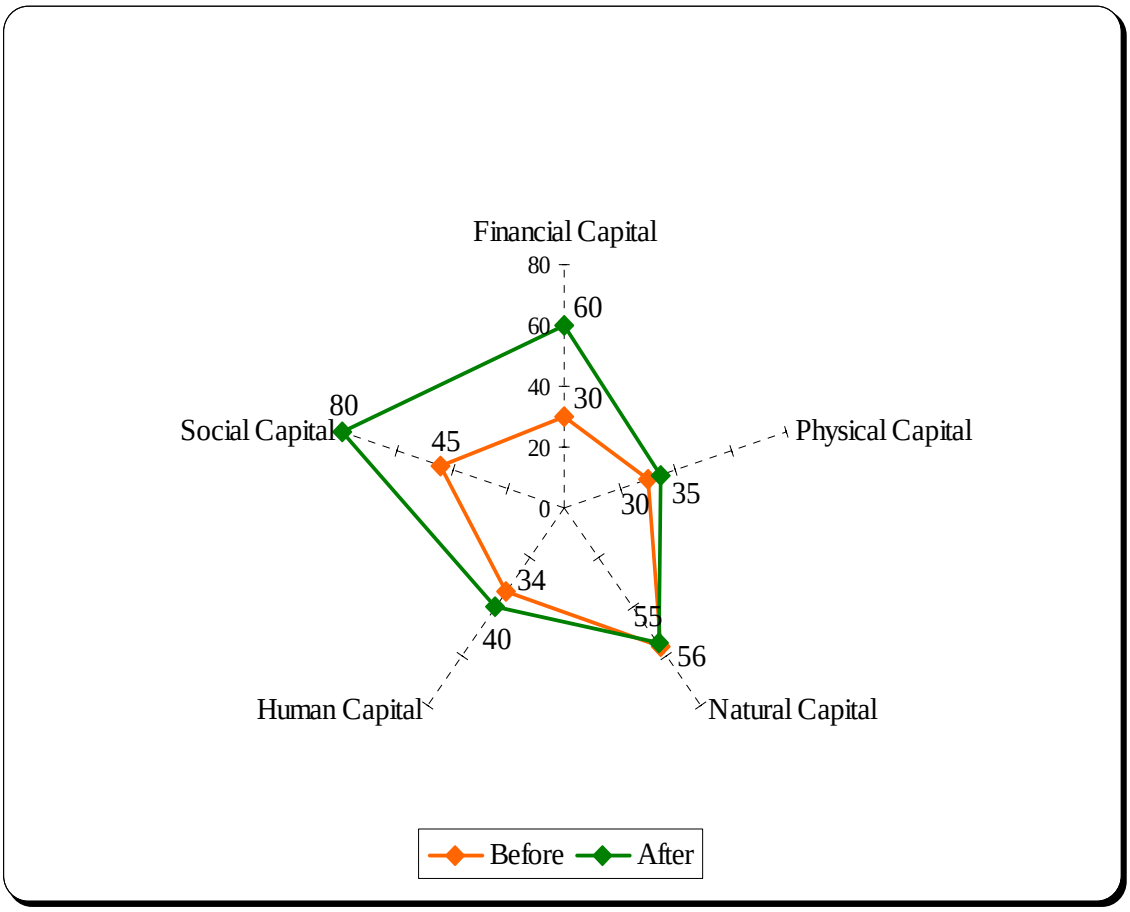

Figure 6.6: Status of livelihoods before and after the implementation of JFM in Nayakheda. *Scale shows the cumulative scores of all the capitals calculated separately for before-and-after JFM implementation by summing up all the scores of five capitals in the sample villages. Scores have been calculated on the basis of considered three situations, best, moderate and worst for each of the indicators. These situations were given 3, 2 and 1 score points respectively. To calculate the scores number of respondent opted for that situation was multiplied by score allotted to that situation.*

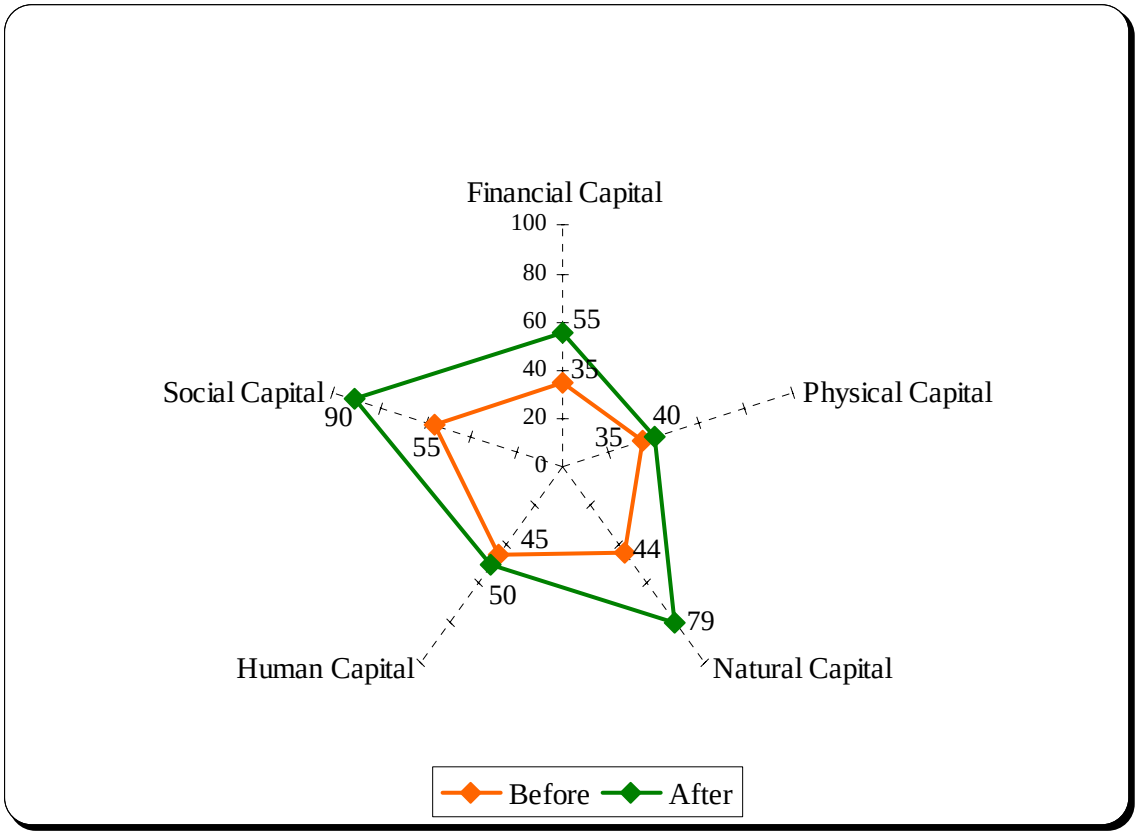

Figure 6.7: Status of livelihoods before and after the implementation of JFM in Keli. *Scale shows the cumulative scores of all the capitals calculated separately for before-and-after JFM implementation by adding all the scores of five capitals in the sample villages. Scores have been calculated on the basis of considered three situations, best, moderate and worst for each of the indicators. These situations were given 3, 2 and 1 score points respectively. To calculate the scores number of respondent opted for that situation was multiplied by score allotted to that situation.*

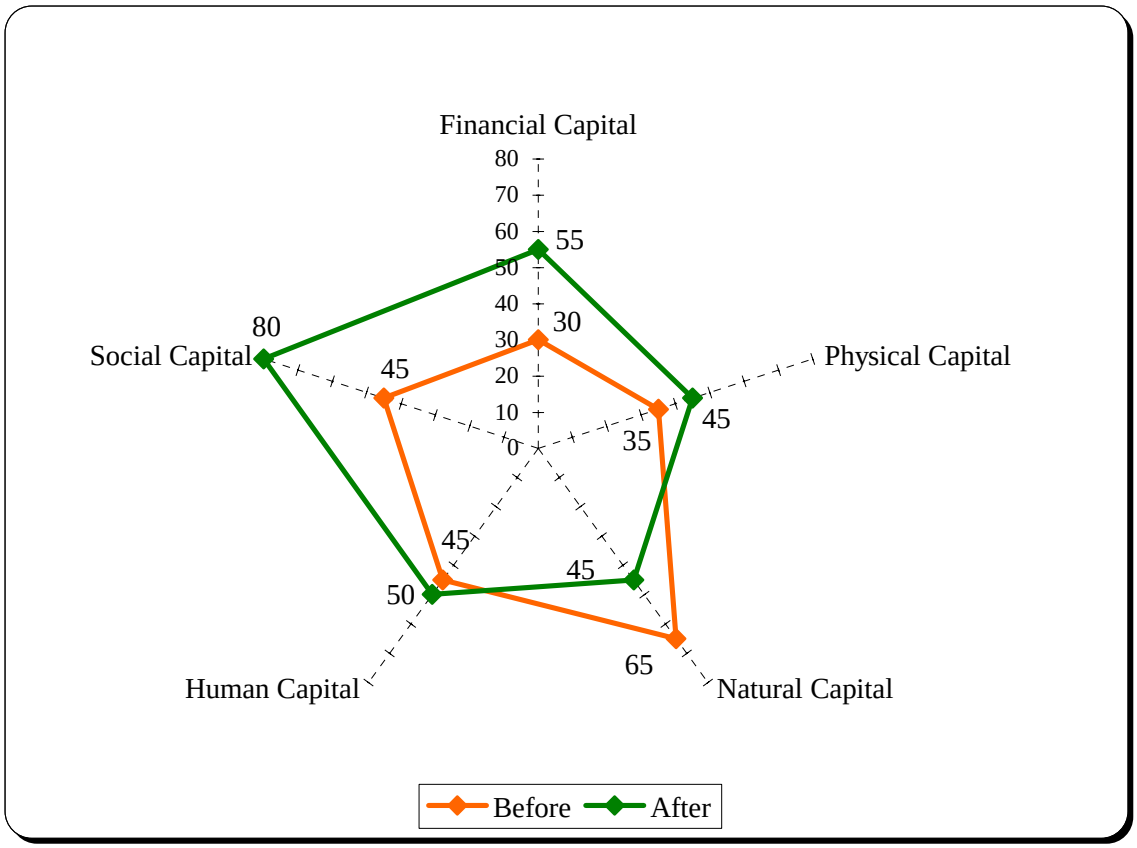

Figure 6.8: Status of livelihoods before and after the implementation of JFM in Nayaguda. *Scale shows the cumulative scores of all the capitals calculated separately for before-and-after JFM implementation by adding all the scores of five capitals in the sample villages. Scores have been calculated on the basis of considered three situations, best, moderate and worst for each of the indicators. These situations were given 3, 2 and 1 score points respectively. To calculate the scores number of respondent opted for that situation was multiplied by score allotted to that situation.*

Part Three

Conclusions and Policy Recommendations

Chapter 7

Conclusions

The research set forth the objectives to design the tool to monitor the impact of JFM on livelihoods in Rajasthan. Additionally, a perception analysis tool was also designed to know the change in livelihoods over a period of time as perceived by the community. A wide range of methods including data collection from secondary sources, primary data collection through GDs, semi structured interviews, observations, interview of key informants were employed, and the tools were tested in the field.

The study found that currently monitoring the impact of JFM on rural livelihoods has very low priority. This is surprising as one of the stated objectives of JFM implementation is the livelihoods improvement apart from improved forest cover. The tools designed through this study have been found to work well in the field. These tools can be adopted by the FDs to monitoring the impact of activities carried out under the JFM.

Although, the field test carried out under this study was intended to test the monitoring tool and to know the workability of the tools in the field, but data collection for the field test has been done with full regard to the methods of data collection for each indicator on which the data could become available within the limitations of time and resources. Therefore, the results of the field test themselves do provide the status of livelihoods in selected JFM villages in Udaipur, Rajasthan. It must be pointed our here that data for some indicators within natural capital could not become available. Results of the livelihoods monitoring should be interpreted within caution for natural capital.

From the field test of livelihoods impact monitoring tool in combination with livelihoods perception analysis tool, it can be concluded that the impacts of

JFM activities in all the villages are consistent and mostly positive but there are wide variations when comparisons are done among 5 capital assets. Financial capital and social capital increased substantially while physical, natural and human capital increased marginally in all the VFPMCs. Among the tested field sites, Ambua VFPMC scored highest, meaning thereby that change in scores of all the capital assets is highest in Ambua village except for natural capital which is highest in Keli VFPMC.

Surprisingly, natural capital scores declined (negative) in Nayakheda and Nayaguda. In Nayakheda it was -1.78% and for Nayaguda it was -30.76%. The reasons for this decline as given by VFPMC members were monsoon failure and increasing harvest of the forest products such as fuel wood, woods for furniture, grazing etc. One of the reason for decline in natural capital as told by one of the FD officer is improper selection of plant species. It is hoped that the tools designed for livelihoods monitoring and perception analysis would help in understanding such issues and a suitable follow-up action.

Numerous factors have been identified for the successful outcome of natural resource management. However, in the ultimate analysis it is the monitoring and local rule enforcement (i.e. local adaptation) which is a necessary condition for successful natural resource management and livelihoods outcome (Pandey 2005). The fundamental necessity of just one factor—monitoring and consequent adaptation—is so critical for the better outcome of natural resource management that other factors such as high level of social capital, presence of formal organization, and peoples' degree of dependence on forest products seems either less important, or more importantly these factors may simply be influencing the outcome via their positive effect on monitoring and consequent improvement of interventions on the ground (Gibson *et al.* 2005).

Such a monitoring of livelihoods is crucial in Rajasthan where almost as many people have sunk into poverty over the past 25 years as have emerged from it

(Krishna 2004). Those who have moved out of poverty in Udaipur have done so by virtue of diversification of income sources; it is the single most important reason associated with households' escape from poverty. Diversification requires taking up some other activity or activities, such as JFM, in addition to agriculture, and successful diversification has in most cases required building a bridge to a city (Krishna 2004).

In summary, there is every reason to believe that using the livelihoods monitoring tool and perception analysis tool it is possible to know the impact of joint forest management on rural livelihoods. Also, there is evidence to show that JFM has had a positive impact on the livelihoods of rural people in study villages. These tools can be applied in other forest divisions across the different regions of Rajasthan without much difficulty. But, making arrangements for raising the awareness about the livelihoods and JFM connections and providing training to monitor livelihoods is really necessary, because there is very limited understanding of the livelihoods issues among the stakeholders.

Chapter 8

Policy recommendations

8.1 The Paradox of stated objectives and ground situation

This study has, among other things, brought out a brought out a fact that is not very encouraging for FD. Even though the livelihoods capitals have shown improvements in scores in study village our literature review and exercise to design and field test the monitoring tool all point out the fact that:

1. There is no effort by the FD or VFPMC for monitoring the impact of JFM on rural livelihoods. It is worth recalling that one of the key objectives of JFM is to improve the livelihoods of the people.

2. There is very limited understanding within FD about the crucial importance of the impact of JFM on livelihoods.

3. The most surprising fact is that the FD is the "biggest land lord" in India. FD actually owns more than 23% of landmass as on today. There is no reason to explain why they should not care about the rural livelihoods, and why they should not monitor the impact of their activities on the livelihoods.

4. There is going to come a day in not very distant future when India's people represented by politicians, civil society and communities themselves are going to raise serious questions about the lack of priority for rural livelihoods in FD. Forest Department is well advised to gear up for improving the people's livelihoods in real terms through their activities of forest management.

8.2 Policy recommendations

If the FD wants policies and institutions that enable local people to have sustainable livelihoods through JFM, then many actions are required urgently. This study, within the limitations of time and resource as noted earlier, has provided some clear understanding about the present situation of livelihoods monitoring and directions for future. Originating from the study are the following recommendations for the considerations of those concerned with improving the livelihoods of the local people through JFM:

1. As there are no established livelihoods monitoring approaches in JFM areas, periodic monitoring programme is required to be initiated. A large amount of money is being spent on JFM activities and monitoring is required to know the impacts of such investments on rural livelihoods. The "Livelihoods Monitoring tool" and "Perception Analysis tool" designed and tested in this study would help in monitoring the impact of JFM on livelihoods in the villages.

2. Before implementing every new activity in VFPMCs a conceptual framework for its impact on livelihoods and forests should be designed. This will help in attributing the changes in livelihoods due to JFM (i.e. a conceptual representation/ impact pathway of potential cause-and-effect relationship between implementation of JFM and its impact on rural livelihoods).

3. Microplans are a blueprint of activities proposed to be done under the JFM. It would be beneficial to incorporate a chapter in microplan on the JFM monitoring (both "process monitoring" and the "impact monitoring"). In fact it would be helpful if micro plan document has a master table showing the year wise proposed activities under the JFM, proposed budget for those activities, completed activities, and the impact of those activities. The rationale behind this recommendation is

that it would help to monitor and improve the proposals and activities and also, achievements would be clearly attributable to the JFM.

4. It is recommended to institute Self Help Groups in VFPMCs because SHG's are performing very well in generating additional income and village fund. The rationale behind this recommendation is that, those VFPMCs are performing well where there are SHG's.

5. Training should be imparted to FD and VFPMC members to enhance their understanding of livelihoods and skills of monitoring. The rationale behind this recommendation is that in order for stakeholders to become better at their work to enhance the productivity, proper guidance and training facilities are must.

6. The drought conditions in Udaipur in the last five years have led to extensive soil erosion in some village. Thus, it is recommended to plant soil protecting NTFP species to reduce soil erosion and provide livelihoods benefits. Rationale behind this recommendation is that it will reduce soil erosion and also help to improve livelihoods by the timber and non-timber forest produce from these plants.

7. Selection of plants should depend on soil type, rainfall, and temperature of the particular area. The selection should also be based on livelihoods needs of the people. The experiences of the forest officers can be of great help in this case. The rationale behind this recommendation is that it will lead to increase in forest cover and regeneration of forests which in turn may improve livelihoods by providing forest produce and work to the villagers.

8. VFPMCs should be encouraged to perform better and returns should be given in the form of awards to the committees. These awards can be made more innovative (for example, more entry-point activities to improve livelihoods in better performing villages).

8.3 Some suggestions for effective implementation of monitoring methods

1. As already discussed, the time of the year available for study was non conducive. It will thus be beneficial for the researchers/monitoring personnel if the chosen time is not that of the wedding season. During this time it becomes very difficult to meet people in the village. Even when people are available in groups (such as wedding party) they are unwilling to spare time for group discussion.

2. For the effective implementation of monitoring tools' data collection timings of early morning from 7:30 AM to 10:00 AM and evening from 5:30 PM to 8:00 PM are considered good.

3. As discussed, women are shy and there is an apparent lack of leadership quality among women. To take this factor into account researchers/monitors must try to talk to women in their local language, as far as possible. Also, there is a need to encourage women while talking to them.

4. To overcome the difficulties of low participation and limited attendance in group discussions, researchers/monitors should meet the locals personally twice or thrice before the actual meeting. Meeting before the actual meeting can help to clear the study objectives and purpose of the visit.

5. It is always better for researchers/monitors to inform village government personnel and villagers well in advance, so as to avoid cancellation and postponing of the meetings. Information to each of the FD personnel and NGO's officers should be given in advance.

6. Without the Forest Guard and Forester and/or Forest Range Officer it was almost impossible to reach the village and meet villagers. This is so

because often they are the only people working routinely in the village. If these people are trained well they shall be a great asset to the FD.

Annexure 1

Scoring technique

All the indicators, in the tools were divided into three conditions best, moderate and worst. These three conditions then were allocated scores according to their ranks; allocated marks were 3, 2, and 1 respectively. After assigning the marks, numbers of respondents were multiplied by the allocated marks in that particular condition. Finally, all the scores were added for a particular capital asset to get the cumulative capital scores (total score). With this scoring technique all the scores were calculated to get the cumulative scores for each capital asset for both pre- and -post implementation of JFM separately.

For example, suppose, there are only 2 indicators in human capital and 5 respondents in a particular VFPMC village called 'Ambua'. Thus we have 5 sheets filled by 5 different respondents for Ambua village. The responses for each indicator from all the 5 respondents are shown in the table below. To get the cumulative scores for human capital total responses are multiplied with their respective assigned scores and then summed up for all the three conditions. Therefore total cumulative score for human capital will be (6+8+4) 18.

Scoring technique for calculating cumulative scores

Human capital	**High (3)**	**Medium (2)**	**Low (1)**	**Total Respondents**
Response for Indicator 1	1	2	2	5
Response for Indicator 2	1	2	2	5
Total responses	**2**	**4**	**4**	**10**
Total score[#]	2*3=**6**	4*2=**8**	4*1=**4**	

[#]Total score = Total response * score assigned

Cumulative score = total score for high (2*3) + total score for medium (4*2) + total score for low (4*1) = (6+8+4) 18.

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