Lessons from the Equator Initiative:
Rural Commune's Medicinal Plant Conservation Center, Pune, India

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1.0: INTRODUCTION

1.1: Background

Community-based conservation (CBC) has emerged as an institutional response which advocates reducing poverty by conservation and sustainable use of biodiversity. The approach is yet to yield desired results and has shown mixed performance in different cases. Some (Redford and Sanderson, 2002) consider CBC as impractical in simultaneous achievement of biodiversity conservation and poverty reduction. However, there are some outstanding examples of CBC which have counteracted this assumption by demonstrating success in achieving both these seemingly conflicting goals. The Equator initiative (EI) of United Nations Development program (UNDP) (for details, please see www.undp.org/equatorinitiative) is a well-known example, which through competition, recognizes and rewards extraordinary CBC initiatives from the Equatorial regions. One such interesting CBC initiative recognized by EI is the Rural Commune's Medicinal Plant Conservation Center (RCMPCC) in Pune, India. RCMPCC has achieved great success in advancing the cause of medicinal plant conservation while creating alternative livelihood opportunities through participatory and collaborative modes (such as a community network of herbal production centers, collaborative botanical inventories etc.).

This report proposed to describe and understand the conditions that enabled CBC initiatives to be successful by researching lessons from RCMPCC, Pune. It was one of the several EI case studies in a coordinated team project [1]at the Natural Resources Institute (NRI), University of Manitoba. The research findings will have theoretical and practical implications for strengthening existing and future community based conservation initiatives.

1.2: Objectives of the report

The purpose of the report was to understand and describe major lessons from the successful CBC initiative i.e. an Equator initiative award winning case of RCMPCC, Pune in India, which may provide useful learning for theories and practice of community based conservation. The report addresses three specific objectives:

i) To describe the self-organization of the RCMPCC, Pune;
ii) To describe and analyze the cross-scale institutional interactions of the RCMPCC, Pune;
iii) To understand the impact of the selected community-based conservation case in achieving the goals of biodiversity conservation and poverty reduction

1.3: Rationale for the research

The sustainability of complex and linked social-ecological systems like CBC requires understanding of several disciplines of social and natural sciences and its creative synthesis through approaches such as sustainability science (Kates et al, 2001). Berkes (2003) points out that in the case of CBC, various interdisciplinary sub-fields such as common property, traditional ecology, political ecology, ecological economics and environmental ethics have evolved from

[1] The research team was guided by Dr Fikret Berkes and faculty members at NRI. Dr. James Gardner and Dr John Sinclair of NRI provided guidance in field research and valuable editorial comments on the earlier drafts of this report.

the 1970s and 1980s to enhance the understanding of the linkages between social systems and ecological systems. The analysis grounded in such new fields could be useful in understanding not only the linkages of social and ecological systems but also the conditions governing the effective functioning and sustainability of CBC initiatives.

It also has been realized by some conservation scholars like Berkes (2003) that understanding the facilitating conditions of successful CBC initiatives would be more important than evaluating their success. In the research that documented various forms of CBC initiatives, poverty alleviation and biodiversity conservation were the most compelling common characteristics or goals that have been achieved. In fact, these two goals form the overall purpose of the Equator Initiative of UNDP (United Nations Development program). The results of achieving the twin goals of biodiversity conservation and poverty reduction are however, mixed in terms of achieving both the objectives, simultaneously. For example, Kellert et al (2000) evaluated the CBC initiatives in Nepal, Kenya and USA and found that human development goals like equity and empowerment are achieved more frequently than biodiversity conservation goals. In the study of CBC for African wildlife protection the, simultaneous achievement of social-economic and conservation goals were found to be far more complex and difficult.

More recently, Berkes (2003) focused on the five most important characteristics that explain the effective functioning of the CBC initiatives. These are: the importance of cross-scale interaction, adaptive co-management (through self-organization), the question of incentives and multiple stakeholders, use of traditional ecological knowledge and developing a cross-cultural ethics. In the context of current research, self-organization and cross-scale interaction are further elaborated.

CBC can be seen as 'linked' social-ecological systems, which can deal with complexity thinking (Gunderson and Holling, 2002, Berkes et al 2003). The self-organization aspect is one of the key evolutionary characteristics of all-living systems and widely applied to describe and understand the sustainability of complex and linked social-ecological systems like CBC. The differential capacity to self-organize results in diversity of CBC institutions to exist in different ecological locations.

The self-organization capabilities of the systems are one of the important characteristics of resilience. Resilience is the most sought-after concept in the discussion of sustainability of social-ecological systems. Resilience of the social-ecological system provides capacity to absorb change/surprises, cope with uncertainty and thereby maintain stability or multi-equilibrium the system. (For details please see Resilience alliance, 2001, www.resilinecealliance.org). Resilience provides opportunities for renewal and reorganization following surprise/change. The adaptive learning or learning-by-doing is of central importance to build the resilience of linked social-ecological systems. The best example of this is the Adaptive-co-management (Please, see Buck et al, 2001). The change or surprise provides an opportunity to the local users or members of CBC to self-organize either through use of TEK or empowering them to manage the given resources. Some other literature on CBC also concurrently supports this vision of creating a stake of the local community to conserve the resources in question (for instance, Brown, 2002; Berkes and Jolly, 2001).

Another important generic feature of the successful CBC is the cross-scale interactions among various stakeholders. Sometimes it results into what is known as 'Panarchies'(Holling et al,1998). The panarchies are institutional nesting or loose associations of the actors, institutions and processes across space and time scales. The cross-scale view of CBC could provide basis for accommodating diverse actors and their values, knowledge into decision-making and management of a given natural resource. The most common forms of cross-scale institutional solutions are found in the examples of partnership between local users or groups with government as found in co-management arrangements in Canada, Joint forest management in India and implementation of aboriginal resource rights in USA, New Zealand and Australia (as cited in Berkes, 1999). There are several kinds of institutional forms (such as multi-stakeholder bodies, citizen science, policy communities, etc.) and research approaches (Examples include ecosystem management, Adaptive management etc. that facilitate and speed-up the cross-scale interactions. Berkes (2001) concluded that cross-scale institutional linkages should be designed in a manner, which facilitates self-organization in cycles of change and enhances social learning.

The results of CBC initiatives are mixed in terms of simultaneous achievement of the twin goals of biodiversity conservation and poverty reduction. Given the rich diversity of nature and performance of CBC initiatives, they can be best understood through enabling conditions that have nurtured success and sustainability of CBC initiatives than standard evaluative criteria of measuring success. Analyzing these conditions should help understand why the CBC initiatives are successful and will help inspire and recreate success and sustainability of similar CBC initiatives.

1.4: Research Methods and Site selection:

The two major components of the research were i) Literature and document review and, ii) Field data collection. The literature review involved obtaining a detailed understanding of main research concept viz. CBC. A review and analysis of the relevant project documents was also conducted. The field research component used a mix of participatory methods, such as focus groups, small group workshops and semi-structured interviews. They have been used extensively in working with project partners and local communities (Narayan, 1996; Chambers, 1994). These methods were considered relevant to conduct research aimed at empowering community members by utilizing local knowledge systems and practices and by giving local people the opportunity to actively participate in the research process.

1.4.1: Data sources

The research was based on mainly two sources of the data: 1) primary sources: Semi-structured interviews, Personal discussions, Focus groups and workshops, and 2) Secondary sources, which include, study and research reports, activity progress reports and conceptual notes prepared by and handed over to researcher by RCMPCC, Pune office[2]. The Impact assessment reports

[2] Author wishes to acknowledge the generous support and constant guidance of Mr Muneer Alavi, Mr Sudarshan Rodriguez and Ms Rajashri Joshi and Brig Kaul of RCMPCC. Dr. Utkarsh Ghate and Dr. Darshan Shankar also provided constructive comments and access to FRLHT, Bangalore. Dr. Vaishali Gawandi, Mr Rahul Brahme, Ms. Pujali Deokar, Mr. Bhagwan, Dr Rahul, Dr Suresh and Mr Mama 's support is very valuable in conducting the field work. The officials and staff from the Maharashtra Forest Department particularly, Mr. Bhangre, Mr. Majumdar, Mr

provided by RC (Rural Commune), Mumbai were also useful in generating some insights and refining the checklists. The secondary sources of data are indicated in the following table:

Table: 1: Research methods and Secondary sources of data used to collect data

Nature of research participants	**Research Methods used**	**Place**
RCMPCC staff, consultants Forestry students /interns and advisors (12)	Workshop (1)	Pune
RCMPCC management and staff (4)	Semi-structured interviews (4)	Pune
State, district and Range Forest officials involved in genesis and grown the project (6)	Semi-structured interviews	Sawantwadi, Nagpur, Kolhapur, Pune, Panji (Goa)
FRLHT representatives (2)	Semi-structured interviews (2)	Amboli and Banglore, (Karnataka State)
RCMPCC 's community organizers (3)	Guided focus group discussion (1)	Pune
Forest Departmentstaff at village and range levels (3)	Semi-structured interviews	Amboli MPCA
Members of local management committee (LMC)	Semi-structured interviews (3) and Focus group discussion (1)	Amboli MPCA
Members of LMC/Self-help group (SHG) /Villagers/Community leaders/school teachers /village forest staff (11)	Workshop (1)	Amboli MPCA
Members from SHG (2)	Semi-structured interviews (2)	Amboli MPCA
Members of LMC/SHG (varied in numbers, range 8-12)	Focus group discussion (3)	Amboli, Honyakoli and Leghapani MPCAs

Note: The figures in the brackets in the first two columns indicate the number of participants/methods.

In addition to these consultations, the researcher also took part in the training programs of Barefoot Botanists workshop and village women of *Hiranaykeshi* self-help group organized by RCMPCC. Field visits to the farmers who undertook the cultivation of medicinal plants inspired by RCMPCC in and around Amboli MPCA were made.

Gogte, Mr.Khaire, Mr. Gawli, Mr. Rajadne, Mr.Konduskar,Mr. Shivram, MrKashiram, have been very helpful. Without the warm support and cooperation of the local management committee and villagers of Amboli particularly Mr Dilip Sawant, Mr Arun Chawan, Mr Anthony, Mr.Anirudhha, Ms. Merry D'souza, Ms.Anita Sawant, Ms Dixita Guruv, Mr.Shailesh, Mr. Prashant Mr Suresh, local field work in Amboli would not have been possible. Ms. Vaishali, Mr Arun and Mr Mahadev provided very useful research and language assistance. Usual disclaimers apply.

Researcher observed communities closely through participant observation techniques in the Amboli MPCA for more than three months. Researcher was invited as an observer to attend the three monthly review meetings of RCMPCC, which helped understand the management of RCMPCC.

1.4.2: Site and Community selection

Most of the fieldwork for this research was carried out from November 2003 to March 2004 in Maharashtra State. The research started with an inception workshop organized at the RCMPCC office, Pune in November 2003, where the research designs and objectives were shared among RCMPCC staff and their technical advisors. Based on the feedback obtained in this workshop, three field sites were finalized and visited in the month of December 2003. These sites are the project areas of RCMPCC typically known as MPCA (Medicinal Plant Conservation Areas) and included i) Kharpud MPCA (Central Maharashtra), ii) Leghapani MPCA (Northern Maharashtra), and, iii) Amboli MPCA (Southern Maharashtra)[3]. During the visits to these MPCAs, local consultations and focus groups with LMC and SHG members and forest walks with local healers organized. Some insights related to the self-organization aspects of RCMPCC initiative were gained during these exercises.

The Amboli MPCA was chosen as the final site for the community consultations based on pre-determined criteria, viz.

- Willingness of the community/project functionaries to participate
- Presence of a primary school
- Evidence of self-organization/ adaptation on the basis of use of local knowledge TEK (For example, number of TEK experts known, documented knowledge in database etc)
- Record of participatory management (presence of common-property institutions, networking /interaction with local/state/regional/national institutions for resource management partnership)
- Overall spirit of community cooperation in research (as determined by RCMPCC)

Most of the observations, key findings and concerns that have emerged from these consultations are discussed in the section two. The checklist developed at Center for Community Based Natural Resources Management at the Natural Resources Institute, University of Manitoba is the major instrument that was used to organize the data collected.

[3] Please see figure 1, areas marked with → for locations of selected field sites and other MPCAs in Maharashtra.

2.0: RESULTS AND DISCUSSION

The current research is based on the team project by student researchers and faculty members at the NRI, University of Manitoba. The results and discussions presented in the second section follows the same sequence of questions in order to facilitate comparison across the cases pursued by three other student researchers. The findings are to be verified and shared with RCMPCC and local communities through workshops and a local language report in August 2004.

2.1: Brief description of the RCMPCC

Contact details:

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Mukundnagar, Pune- 411 037
Maharshtra State, India
Tel. No. 91-20- 24266629 / 24270216
Fax No. 23433078
Email: ruralcommunes@vsnl.net, rcmuneer@vsnl.com, rcmpcc@vsnl.com
Key people: Mr. Muneer Alawi, Executive Director and Ms. Rajshri Joshi, Assistant Project Director

The RCMPCC is an innovative program for the in-situ conservation and sustainable utilization of the medicinal plants diversity of the Maharashtra state through developing partnership among the Forest Department, local communities and NGOs. To this end, the RCMPCC, in collaboration with other stakeholders had organized several activities such as establishment of a network of thirteen MPCAs (each ranging from 250-400 hectares) in Maharashtra State and documented some 50,000 plants, representing more than 50 different species in these MPCAs through participatory approaches like the barefoot botanist program, CAMP (Conservation Assessment and Management Plan)[4], local healers conventions and scientific assessments by the field botanists, establishments of local management structures such as LMCs and SHGs. RCMPCC organized range of training and capacity building programs to strengthen LMCs,SHGs, local forest staff and villagers to enable them to improve local livelihood and engage them in sustainable conservation of medicinal plants through production, marketing and local sale of herbal products. RCMPCC has also created a network of local healers, field botanists, Forest Department staff and interested villagers in Maharashtra to document and disseminate local knowledge of medicinal plants, which could also revitalize local health traditions. The MPCA created through these projects were legally notified by the state Forest Department of Maharashtra as conservation priority areas and inspired other state and the Government of India to include them in their conservation and development agenda.

The MPCAs are selected through consultations with the Forest Department, local communities and available scientific literature based on the following criteria:

- Relatively undisturbed forest areas representing different bioclimatic zones.
- Forest areas with rich biodiversity

[4] See section 2 for a brief description of CAMP and other initiatives of RCMPCC.

- Areas with natural availability of water (micro watershed)
- Locally and otherwise known for harboring medicinal plants.

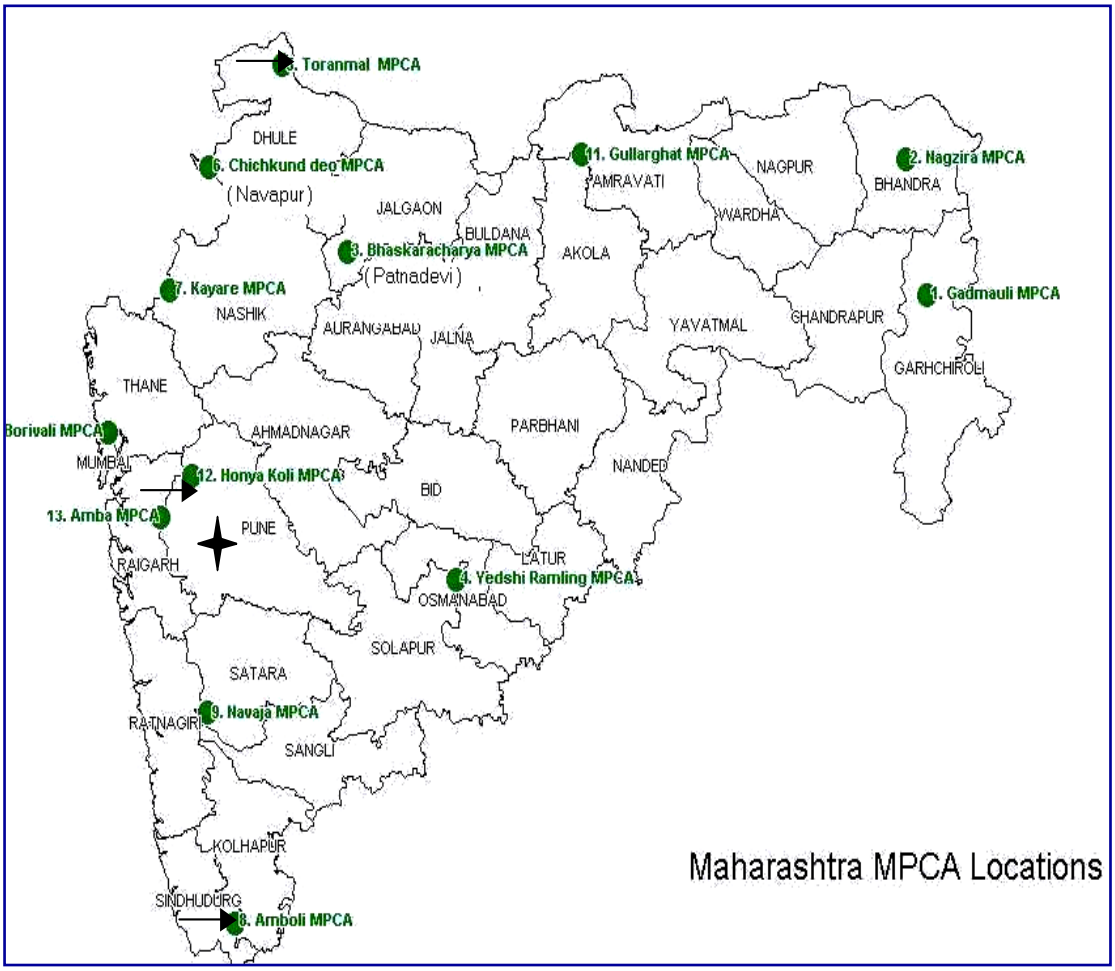

Figure 1: Map of Maharashtra showing locations of MPCAs

The selection of MPCAs was completed prior to start of the community activities by RCMPCC and later on granted legal status of conservation areas through State forest department's official notification.

2.2: Community organization

2.2.a: Origins of the project

The RCMPCC initiative officially launched on 31 December 1999 but the project activities in Maharashtra commenced in February 2002. The actual community based activities started in August 2002. The project[5] has originally been submitted under the head Medicinal plants conservation and their sustainable utilization and funded by United Nations Development

[5] Please note that the use of the word 'project' refers to the RCMPCC initiative in this report.

Program through the country cooperation framework vide UNDP ccf-1 ind/97/947 by Bangalore based NGO; Foundation for Revitalization of Public health traditions (FRLHT). FRLHT was the main implementing agency with local implementation support of State Forest Department and Rural Communes, Mumbai, Maharashtra. The project submitted to UNDP for the Equator Initiative award in February 2002.

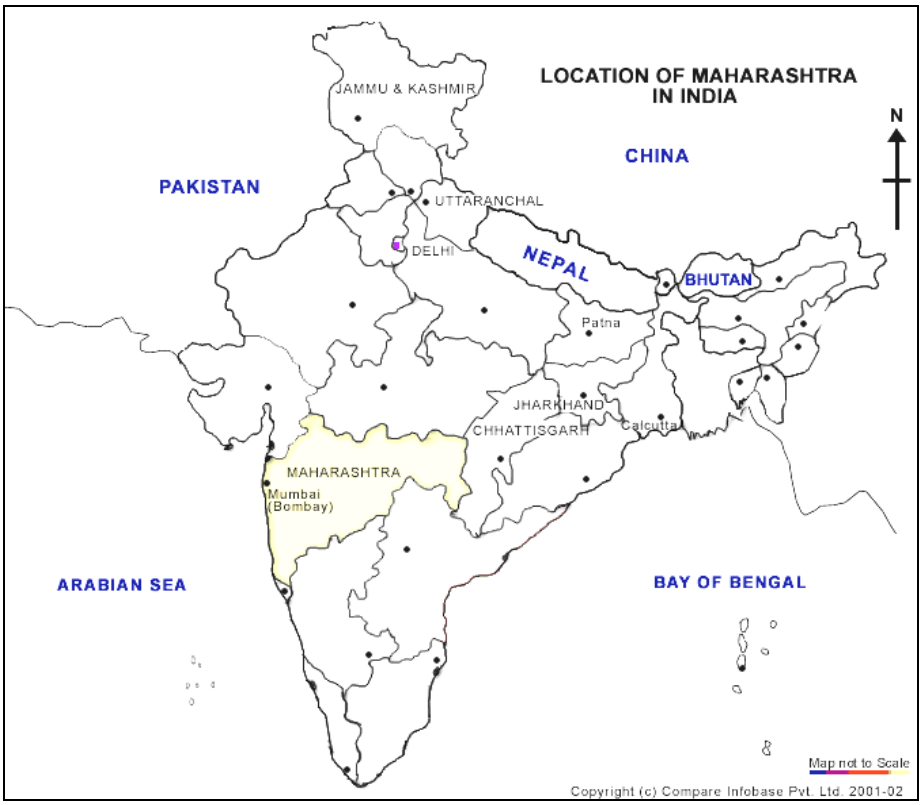

Figure 2: Political Map of India showing Maharashtra State
Source: http://www.mapsofindia.com/maps/india/indiastateandunion.htm, 29 June 2004

2.2 a.1: Source of Inspiration

The project borrowed its vision from FRLHT's earlier work in Kerala, Karnataka and Tamil Nadu States originated in 1993. FRLHT had also established three MPCAs in Maharashtra through partnership with state Forest Department during 1997-2000 with the funding support from local funding NGO called SDTT (Sir Dorabji Tata Trust). FRLHT with the support of a Mumbai based NGO called Rural commune had already started three medicinal plants conservation areas in joint partnership of the then Principal Chief Conservator of Forest of Maharashtra state and was involved in improving community health through awareness raising and training activities. The RC was the strongest claimant for such partnership in Maharashtra and thought by FRLHT as the most appropriate implementing agency in Maharashtra. FRLHT had developed and demonstrated the potential and inclination for experimenting with the new model of community health improvement activities with in-built focus on livelihood generation through medicinal plants, use of local knowledge systems, and biodiversity conservation through partnership with state Forest Department, local communities and NGOs. FRLHT's expansion plan and readiness of RCMPCC backed up by funding support from UNDP made it happen. The

platform for partnership therefore was created through strategic, synergistic and symbiotic relationships.

2.2.a.2: Trigger event and Catalytic elements

A series of workshops at the state level mainly between partnering NGOs and the state Forest Department was held to prepare and finalize action plans. For example, the state Forest Department was considered partner for identification of project sites or MPCA (Medicinal Plant Conservation Areas). The criteria for identifying MPCA were jointly decided in these meetings

Some of the senior forest officials of the Forest Department were on deputation with the FRLHT in past. So the state Forest Department had already gained prior experience and exposure to the community-based conservation activities. The official launch of the program was also designed and jointly conducted by RCMPCC and FRLHT in Kharpud MPCA of Maharashtra by field level exposure to all major project players including senior forest officials (chief conservators and their deputies), local communities and partnering NGOs. This also helped convey the message of the mission in an appropriate spirit. The conviction and commitment of the senior forest officials was very important stimulus for initial start-up of community-based conservation activities.

The funding availability through UNDP CCF-I arrangements at the national level by Ministry of Environment and Forests created an opportunity to implement the project.

2.2.b: Knowledge Base

2.2.b.1: Sources of knowledge and local knowledge holder's contributions

The knowledge base tapped in the project was mainly local knowledge about medicinal plants and their uses. The main sources of knowledge were three : i) Ayurvedic (the classical Indian traditional knowledge which is systematically documented in ancient scriptures and emerged as a parallel and significant herbal-based alternative to allopathic medicines),ii) folk (traditional knowledge which is un-codified and passed on through oral transmission some of which has been documented by FRLHT and RCMPCC databases), and, iii)other type of local knowledge which is hands on and acquired by local forest staff, project staff and communities. The examples of the other type of knowledge was largely reflected in the conservation works related to the MPCAs, e.g., demarcation of the boundary, protection from grazing, fires and trespass, the knowledge and skills were already available with the state Forest Department staff working at sub-district and village levels.

All three sources of knowledge described in previous paragraph were held by different groups of people. The folk knowledge held by local healers and knowledgeable community members has been useful in database creation and ecological monitoring of local medicinal plants and their habitats. Women's knowledge in some of the MPCAs (like Amboli and Leghapani) has been used in developing and processing the herbal products such as face packs and herbal powder for locally-prevalent diseases and they have been organized into self-help groups for making different herbal formulations. The local forest staff such as guards and foresters' knowledge have also been useful and three of them at each MPCA have been identified as a barefoot botanists or

village botanist- a person who is knowledgeable about local flora and fauna and interested and keen to improve his/her existing knowledge.

2.2.b.2: Knowledge exchange and capacity building by external actors

The Ayurvedic knowledge base has been used and shared with the local communities by RCMPCC staff through various training programs such as CAMP workshops. The knowledge bases of local healers and women were strengthened through village biologist training programs and local healer's workshops. These programs have imparted skills such as the making of a herbarium; undertaking sustainable use activities through identification and processing of some medicinal plants for local health improvement and income generation and long-term monitoring and management of MPCAs.

A range of training programs and capacity building initiatives were organized at various stages of the project implementation by RCMPCC. The project inception and orientation of the local management committee members and the range forest officer was conducted by RCMPCC during the initial stage of the project. Local NGOs of Maharashtra like Swayamsidha and Amchi Arogya Sathi were also involved in imparting the training on issues like processing and marketing of herbal drugs and value addition activities for the members of local management committee of all thirteen MPCAs. RCMPCC also organized hands-on training for LMCs on marketing of herbal products. RCMPCC also provided an opportunity to LMCs and SHGs to showcase their activities in Mumbai in an International gathering called 'herbal 2000' and 'herbal 2001'. FRLHT had conducted CAMP[6]workshops, which provided practical training on botanical inventorizations and participatory rapid assessment of medicinal plant diversity. The Botany departments of Pune and Nagpur Universities were also involved in the CAMP workshops. FRLHT also organized workshops for senior forest officials and other project implementers on issues such as incorporating project components like MPCA; medicinal plants data etc. in the working plans of districts. FRLHT and RCMPCC have been organizing barefoot botanist or village botanists workshops where the local healers, LMC and SHG members, and village forest staff can exchange and enhance their knowledge of medicinal plants with formally-trained field botanists and scientists through participatory and interactive ways (e.g. such as guided forest walks by local healers, preparing herbarium records with local and botanical names of plants). An NGO called Gokulawar provided training on safer methods of honey extraction (bee-friendly) to LMC members. A State Government training organization named Maharashtra State Industrial Technological Consultancy Organization was also involved in providing training on an issue of enterprise development through herbal products.

2.2.c: Leadership and key people

The previous work of FRLHT in the southern states of India guided by Dr Darshan Shankar and team of dedicated professionals has provided the vision for the project. Mr. Gogte, the then PCCF of Maharashtra State Forest Department was the key person from the Forest Department

[6] CAMP is a process developed by IUCN for identifying endangered species of the plants – 'red listed' and work out programs for their recoveries and enrichment through participatory efforts at local level by the field botanists, local healers, villagers, forest staff and NGO representatives through forest walks and trails. The participants engage in dialogue and combined understanding of local medicinal plants and their status.

who supported the vision and facilitated the formal partnership with the state forest department. Mr Muneer Alawi, the Director of RCMPCC and Brigadier Kaul , Senior advisor of FRLHT and RCMPCC have crystallize the vision into action and provided the institutional structure and staff for implementing and up scaling of the project in Maharashtra State. Senior officials like Mr Majumdar and Mr Satish Ekluchwar of the Forest Department generated the positive environment within the Forest Department through their direct involvement in implementing the project.

The role of major actors and institutions changed over time. Most of the key people and institutions named earlier were part of the project management board in the beginning. Gradually at the project matured, some of the people shuffled. The major changes in the roles happened in the case of the forest officials. Most of the key people are still providing their input in varying capacities to the project but their degree of involvement has been reduced. Mr Gogte was in the project management board while he was Director of the Social Forestry in the Forest Department and after a year of so, he became Principal Chief Conservator of Forest (PCCF) of the state Forest department. This has provided top-level management support from Forest Department and continuity. Mr Satish Eklunchwar provided leadership by working as a project director from the Forest Department with RCMPCC. After two years he rejoined his department. Many of field level activities are now handled through the local management committees, the heads of which have been changed at most places in consultation with the members.

The Women in the project villages/sites have been organized in the SHG and many of them have now economically and socially progressed then they were before. At least three out of 11 membership positions of the local management committees formed under the project were reserved for women and they did become actively involved in the local level management of the project in the villages.

2.2.d: Learning

2.2.d.1: Processes of learning

The major learning occurred at the different levels (i.e. village, district, state, national and international) of project implementation. Local community in village learned new skills of identification, herbarium preparation and new uses of medicinal plants. Programs like local healers' conventions and village botanists' workshops helped in recognition and 'valorization' of local knowledge relevant to medicinal plants. The knowledge exchange occurs in these participatory equipped people with a new knowledge about local value addition activities such as herbal products development through sustainable use. The women organized in the form of SHG at village and district levels. These women folks in project villages were able to enhance their participation in decision making, designing and implementing the income-generation activities, that they felt appropriate. The project's goals have pushed the agenda of medicinal plants in the conservation and development plans of the state and district forest department. For example, the recent district/divisional working plans of forest departments of Sawantwadi and Kolhapur divisions incorporate concepts like MPCA and scientific data available from the field studies carried out as part of project activities. At the national level, the project provided good demonstration of linking health and conservation issues. Other development departments have

leaned to bank on the self-helped group formed by RCMPCC to reactivate some of theirs 'defunct groups'. The exposure of some of the village folks in a nationally significant event like herbal products fairs proved useful and generated a healthy competition among the local management committees of various MPCAs. The social learning in terms of exchange of local and scientific knowledge that occurred at various levels helped revitalize the local health traditions, conservation of medicinal plants through sustainable use and income generation.

2.2.d.2: Evidence of adaptive management through learning and networking:

The structure of the project management has undergone some changes since its inception. The local management committee's were registered as cooperative societies after they took up income generation activities like the sale of medicinal plant saplings or herbal products. The structure of the local management committee set up at village level has been changed after non-participation of certain members. The initial training program for SHGs was uniform in its content and delivery with in village. However as more than one SHG gradually evolved with in the village, the program content was revised for different SHGs according their interest, needs and skills. Eventually different training programs evolved for different SHGs even in the same village or MPCA. The forester as a secretary of this local management committee improved the relationships between local communities and the Forest Department and at a same time maintains the stake of the Forest Department in monitoring the use of funds at local level. This has helped Forest Department in ensuring the commitment of the communities in not only conservation but also protection of medicinal plants (e.g. in Amboli MPCA people helped prevent illegal extraction of locally known *Narkya* plants by outsiders).

The community organization component was initially to be managed through forest department. But after the initial project management workshops it was realized that the RCMPCC might be better equipped with the skills, experience and flexibility for working with local communities and there fore assigned with the responsibility of working with local communities. The roles for handling community activities at village level thus interchanged between Forest Department and RCMPCC.

The roles of SHG and LMC were clarified and divided after they entered in to collaboration for production and marketing of herbal products at the village level, where in SHGs were involved in the production and LMC were entrusted with sale and marketing of herbal products. The self-inspired *learning networks* in terms of self-helped groups of women was established at few MPCAs though collaboration and guidance of local management committee members and RCMPCC. The idea of study circles was visualized but has not been tried out.

Grooming the project director as RCMPCC director has also been useful in gearing the forest departments towards community-based approaches of conservation through value addition activities.

The Forest Department of Maharashtra is now introducing the species recovery and enrichment of certain medicinal plants in their working plans based on the botanical data gathered from the inventorizations, local consultations and scientific assessments conducted during the project.

2.2.e: Funding

2.2.e.1: Funding for initial community organization and training

RCMPCC obtained some project funds initially through the country cooperation framework vide UNDP CCF-I ind/97/947 by Bangalore based NGO; Foundation for Revitalization of Public health traditions (FRLHT). The EI award money was also used to disburse revolving funds to the local management committees. Rural commune, (The parent institution of RCMPCC) through its community health and conservation project funding from the local funding NGO called DBTT had set up three MPCA before the launch of final project in Maharashtra State.

The CCF-I component of UNDP grant funded the initial orientation of the local management committees. Funding for the training of SHGs was provided by state government agencies like DRDA (District Rural Development Agency) and party by the training NGOs with in the state. The funding for training of later project activities like training of cooperative accounts management, cooperative structures etc. were also obtained from DBTT after the money from UNDP supported CCF-I phase run out. UNDP-CCF I supported project related activities in the beginning. Rural commune also helped organize some project activities by convergence of their existing project funds.

2.2.e.2: Funding support for infrastructure

The state Forest Department bestowed the infrastructure and staff support in the beginning through their field offices at the sub-district levels. The existing staff of Rural Commune, Mumbai office also helped in initial community mobilization activities. The FRLHT and some of agencies identified in the project document for CCF I, helped support initial capacity building activities.

2.2.f: In-kind support

The local field staff of Forest Department had helped identify suitable training NGOs. State Agencies like District Rural Development Agency (DRDA) and local NGOs like Swayamsidhha and Shrmajivi Sangathan provided partial voluntary support in organizing trainings for the local village management committees and SHG members.

The local forest officials like RFO and forest guards have helped to establish the structure of arc and demo gardens at all MPCAs. Individuals from the forest departments and retired officials from the Department of science and technology helped in proposal writing and establishing the contacts. At the local level individuals helped organize registration of the local management committees as cooperatives voluntarily.

There were no direct pre-existing relationships among these groups. Some of the individuals had prior experience, exposure and sensitization to community development activities. The RC (parent institution of RCMPCC) has developed working relationship with Government departments through its earlier projects in health, Child and women development sectors. FRLHT has also developed and demonstrated the strong partnership with State forest

departments in south India, which was considered as the positive experience for developing of similar partnerships in the state of Maharashtra.

2.3: Cross-scale linkages

The formal organizational structure of the RCMPCC from the management point of view is described in the following figure:

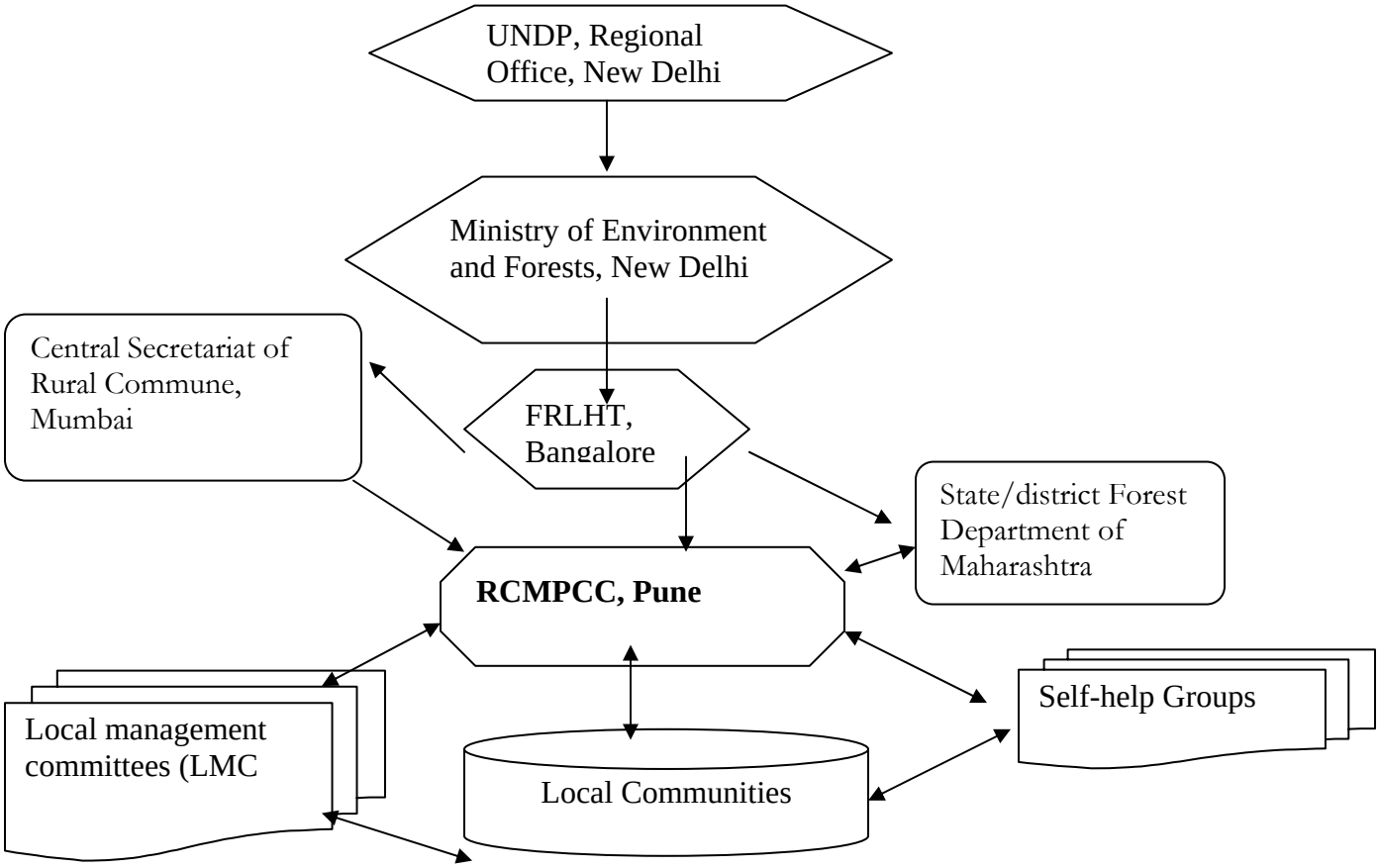

Figure 3: Organizational structure of RCMPCC, Pune

The RCMPCC in the center is the main management body, which has been responsible for entire management of the project under the direct supervision and guidance from the central secretariat of its parent institution RC that is located at Mumbai. RCMPCC has also maintained symbiotic relationship with state and district level forest authorities in monitoring project activities and implementation of certain activities. The actors at the various levels and their relationships with RCMPCC are described in the next section.

2.3.a: Main stakeholders in the Project

The stakeholders in the project were active at various levels. At the most basic level of village, LMCs and SHGs were formally established as part of the project activities. At the most top layer of hierarchical order and comparatively complex international level, funding agencies like

UNDP has been present for the years and responsible for channeling important funding support to shape the project. The roles of other actors at the intermediary levels were also important in varying degrees, and their contributions had helped establish some useful links for achieving the project objectives.

Table 2: Multiple stakeholders at the cross-scale in RCMPCC Initiative

Main Stakeholders/levels	Community/ Village	MPCA	District	State	National	International
UNDP				X	X	X
FRLHT/RC				X	X	X
Ministry of Environment and Forest					X	X
Project Management Board				X	X	
RCMPCC	X X	X	X	X	X	
State Forest Department		X X	X	X	X	
District Forest Office		X X	X	X		
Range Forest Office	X	X				
Village Forest staff	X	X				
Training/Research NGOs	X	X	X			
State Universities		X	X	X		
District Rural Development Agencies (DRDA)			X	X		
Local Funding Trusts		X	X			
Local Management committee	X X	X				
Self-helped groups of Women	X X	X				

Keys:
XX= Strong links represent the actors at both ends are in a strong partnership for meeting project objectives
X= Normal link represent that the actors at both ends (intersection) are in presumably common relationships

2.3.b: Institutional linkages related to the project

2.3.b.1: Sources of Key linkages & their roles in facilitating or hindering project

The RCMPCC director and staff as well as individuals from the project management boards like Brig Kaul, the then PCCF Mr Gogte and Additional PCCF Mr Majumdar were the key individuals helped build and strengthen linkages among RCMPCC, local Forest Department officials and local communities.

The links between FRLHT and RC with the state Forest Department as well as the links between RCMPCC with the local management committee and the State Forest departments were crucial to the success of the project. These links offered a successful community-based partnership through which RCMPCC was able to demonstrate the sustainable use of medicinal plants by combining community' local knowledge and formal scientific studies in participatory ways at sub-district, district and the state levels. The linkages with SHGs with RCMPCC also helped advance the project goals through enhanced participation of rural women. Getting senior forest officials as the project director of RCMPCC Pune helped strengthening the linkages with the Forest Department in Maharashtra State. The link between senior forest officials interacting with the local communities was also significant in motivating the field forest officials to work closely with local communities.

Some SHGs went beyond their assigned normal product portfolio and ventured out for marketing of herbal products outside village using non-local NGOs label. This has caused some tensions among the SHGs at one MPCA.

2.3.b.2: Key horizontal institutional linkages

Local training /Research NGOs like Swayamsidhha, Kalpavriksha and Botany departments of the Pune University were useful in the capacity building particularly for the SHGs and MPCC staff respectively. The linkages with the Government agencies like DRDA were useful in mobilizing financial and human resources for the strengthening SHGs through training.

The MPCA sites have provided good ground for community work for school and college students. Many MPCAs thus became a campground for National Service Scheme (NSS) activities such as botanical identification of common plants, cleaning of litter from MPCA etc. by the college/University students. At few MPCAs, the school students are also actively involved in identification and uses of medicinal plants grown in the demonstration plots created as part of the project.

2.3.b.3: Key vertical institutional linkages

The project has a steering committee at national level vested with the Ministry of Environment and Forests and a project management board at the state level with representatives from FRLHT, DBTT (funding agency), Senior officials from the State forest department, etc. RCMPCC has also developed very strong linkages with LMCs and SHGs through regular consultations at all thirteen MPCAs.

2.3.b.4: Role of existing policy environment

The project has originally been submitted under the head 'Medicinal plants conservation and their sustainable utilization' and was funded by United Nations Development Program through the country cooperation framework vide UNDP ccf-1 ind/97/947 by FRLHT- a Bangalore based NGO. FRLHT was the main implementing agency with local implementation support of State Forest Department and Rural Communes, Mumbai, Maharashtra. The State department of

Maharashtra had developed three MPCAs for in-situ conservation of medicinal plants with technical support from FRLHT and funding support from SDTT from the year 1997 to 2000.

The earlier work of FRLHT and RC in the field of revitalization of local health traditions through medicinal plants has created an enabling environment for an increased focus on and commit more resources for the project on the part of UNDP and Ministry of Environment and Forests, India. This encouraged the birth of CCF for medicinal plants.

The experience of the State Forest Department with regard to Joint Forest management through people's participation was also a positive precursor particularly in ensuring the active involvement of the State forest department. The Ministry of Environment of Forests at the national level has supported the replication of successful models by making medicinal plant conservation their focus. The state department of Maharashtra has also seen this as good sources of funding for their conservation and forest management goals.

2.3.b.5: Impact of project on existing and future policy/bureaucratic structure:

The project has witnessed some parallel developments at the country levels such as establishment of National and State Medicinal boards and the State level medicinal boards. These boards are entrusted with encouraging in-situ and ex-situ conservation of medicinal plants in their designated areas. The project has provided useful lessons for the GEF (Global Environment Facility) initiative of UNDP, which is planning to replicate some lessons learned during this project in the seven other states of India. The Planning Commission of India at national level inspired to set up and fund 200 MPCAs across the India. At the state level, the project has made significant impact to the Forest Department's working plans, wherein the components on medicinal plants and some of the botanical inventorizations carried out during the project have been integrated into broader forest department's planning. The thirteen MPCA established by the project across the state of Maharashtra have become 'forest gene banks and got attention for the conservation agenda of the state forest department. The state Forest Department is proposing several activities as part of the upcoming Forest Development Agency (FDA) program.

2.3.c: Unusual interactions or relationships among actors

The project has demonstrated a viable and successful partnership among local communities (LMC, SHG and network of local healers), Non governmental organizations (RCMPCC) and State/district/sub-district forest departments in meeting the common goals of medicinal plants conservation and revitalization of local health traditions. The project has eventually generated many positive and few negative interactions. However, it should be noted that these negative interactions have stimulated learning on the part of RCMPCC and redesigning of some of the local management strategies. For example, in the case of a SHG, which sold herbal products to outside villages using non-local NGO's trade name and thereby bypassing the commonly understood trade agreement (as expected by RCMPCC), has stirred RCMPCC to evolve new norms and ways for managing the free-riding SHGs and LMCs.

2.3.c.1: Positive interactions

The positive interaction between local communities and the Forest Department that happened as part of this project has empowered some LMC member helping Forest Department in protection of MPCA. There are examples where members of LMC have successfully prevented the illegal removal of certain red-data listed medicinal plant species by commercial interests. The community members of LMC are thus empowered to proclaim joint ownership with Forest Department not just in conservation of medicinal plants but also in protection of MPCAs.

The interactions between the local forest staff at the village level and local communities have been intensified and more frequent than before because of the involvement of the forester in the LMCs. The RCMPCC is being invited to various places by the district forest officials within Maharashtra to conduct training on cultivation, conservation and uses of medicinal plants for their field staff.

The successful partnership between NGOs and Forest Department has encouraged many senior forest officials to manage similar kind of partnership projects in an NGO setting through deputation, despite being known that they may not enjoy same staff support and facilities (like vehicle, access to the communication means) in the NGOs.

The RCMPCC initiative helped form a critical mass of people drawn from all levels of the Forest Department and NGOs like FRLHT, RCMPCC in Maharashtra, retired government bureaucrats, activists, donor agencies, research institutions and universities to work collectively on a common mission of conservation of medicinal plants not only in Maharashtra but also in other regions. For example, forest departments of Maharashtra, Ministry of Environment and Forest at national level and other like-minded NGOs involved in designing and promoting similar initiatives are, now seeking the help of the forest officials who had worked closely with RCMPCC.

2.3.c.2: Negative Interactions

The few MPCAs which fall under the category of the wildlife sanctuaries or protected areas have been guaranteed the fullest protection by Forest Department and therefore promoting the idea of removing medicinal plants from such areas has created tensions between local Forest Department and local management committees.

Horizontally, some of the SHGs have ventured out selling herbal products outside the designated territories of their district and thereby trying to increase their revenues. This generated an element of competitions with other SHGs and some of them felt left behind. Since the formulation of herbal products is a collective intellectual property, the contentious issues of community benefit sharing have started emerging and RCMPCC has recently initiated efforts to resolve such conflicts by working out amicable and equitable sharing mechanisms and evolving the conflict resolution mechanisms at the local level with the help of LMCs.

2.4: Biodiversity conservation

2.4.a: Targeted Species

The RCMPCC project was initiated with a primary goal of in-situ conservation of medicinal plants in thirteen biodiversity-significant areas selected as MPCAs. However, since MPCA have been designated through official notification by the Forest Department and supported by local communities as sustainable local use areas this helped in the conservation of certain other fauna, insects and butterflies and to a point the whole ecosystem.

In a recent strategy, the ex-situ conservation of medicinal plants has been undertaken by RCMPCC. As a part of the efforts some farmers have been encouraged to conduct the agro trials of locale-specific medicinal plants. The schools and village herbal gardens concept is also evolving in order to engage school communities and village communities on a wider scale for cultivation and awareness of medicinal plants.

2.4.b: Improvement in medicinal plants and some preliminary indicators

In absence of any baseline data collection of the project and given a short time frame of three years it is premature to assess any impacts on biodiversity conservation or poverty reduction. However, there are certain achievements, which may throw some light on the impacts, hitherto achieved through this project. Some of them are detailed below:

- In the state of Maharashtra, 13 MPCAs (area ranging from 150ha – 635ha) have been earmarked for conservation by Forest Department in partnership with the local communities and RCMPCC. These MPCA have been granted a legal status through notification by the SFD declaring them as long term Medicinal Plants Reserves. So far 26% floral diversity and 29% of medicinal plants have been recorded from these sites.
- 1210 Botanical Surveys covering 45 percents of MPCAs have already been completed. Through these surveys, herbarium records for 804 species have been prepared.
- Systematic data on medicinal properties and local uses were documented on 326 plants from all MPCAs. A unique illness-specific database of more than 265 plants from Melghat and Totanmaal MPCAs is being developed.
- Out of the threat Category of 54 candidate species (as per the Red data list of IUCN) 26 species were assigned to various red list categories namely critically endangered [CR], endangered [EN] and vulnerable [VU]. Of these 26, 20 species have already been recorded and consequently are getting conserved in various MPCAs.
- Seven Forest nurseries have been established for the local/community collection of planting material seeds or prioritized species from distribution range in the state.

There have been no planned studies in the area that have focused on the improvement of environmental conditions in relation to these observations.

Table: 3: MPCA's contributions towards medicinal plant conservation in State

Indicator	Reported in Maharashtra	Found in MPCAs	% of total reported in Maharashtra State
No. Of flowering plant families	187	115	61.49
No. Of flowering plant genera	1081	500	46.25
No. Of flowering plant species	3025	850	28.00
No. of medicinal plants (FRLHT Data)	2100	470	22.38

The table indicates that MPCAs are becoming a major gene pool of plant diversity in Maharashtra through harboring significant proportion of medicinal and flowering plants in Maharashtra.

2.5: Indicators of poverty alleviation and community well-being

The usefulness of the project in valorizing and popularizing the local low-cost alternative health options can be considered very significant contribution in improvement of the health and nutrition of poor rural people. The indirect benefit is livelihood improvement especially among poor and socially disadvantaged communities in developing countries like India where modern medical facilities are not easily accessible and population pressure is heavy.

There are no data available on this aspect. However the field study by the researcher and some of the internal documents on impact assessment suggest some pointers, which claim economic improvement in the status of local communities. Some of these are highlighted in the following box:

Box: 1: Examples of livelihood improvement through income generating activities

- The local management committees have been provided with some initial revolving funds of 50,000 rupees to initiate herbal drugs production activity. Many LMCs have used these funds and after two years have registered some profits. A few MPCAs have been set up the regular sales outlet and had opportunity to showcase and sale their products in the metro cities of Mumbai in the years 2000 and 2001. The range of profit per participating LMC/MPCA was 5t to 25,000 per year. The LMC of Kaharpud MPCA bought the musical instruments from their profit and is renting them to the neighboring villages, which helped them mobilize more funds.
- The SHGs were given seed grant of Rs 5000 for starting up income-generation activities. Most of these SHGs have also booked profits on their accounts and some of them established credibility to borrow more money from local banks in order to upscale their activities. The women of SHGs are now becoming economically self-reliant and are being consulted in some of the economic decision-making activities of the village such as sale of herbal products in common village festivals etc.
- As part of Enterprise Development component of the program, several activities have been initiated at six MPCAs. These include, market information surveys for selected traded plants & their products, training programs for SHGs on working out costing for finished products, hands-on demonstration on labeling of herbal products and supply of drying equipment such as dehydrator for efficient drying and better storability of medicinal Plants, etc.
- MPCA like Navaja started eco-tourism activity by the LMC members. The members of LMC have become eco-guides who started charging the visitors for tour on trail within MPCA.

2.6: Detailed analysis of community-based conservation

This section analyzes the selected CBC initiative, i.e., RCMPCC from the perspective of what might have worked in the case of RCMPCC to make it as a successful community-based conservation initiative.

2.6.a: Mechanisms, dynamics, drivers:

2.6.a.1: Analysis of the catalytic elements that made initiative worked:

A series of significant events were responsible for the RCMPCC initiative and its sustainability. The project was set on the strong foundation of the solid and tested vision of a few sympathetic souls from NGOs such as FRLHT and RC as well as senior officials from the forest department. In a way the project is a replication of successful model of medicinal plant conservation initiated by FRLHT in southern Indian States. The funding from UNDP helped anchor the project on strong financial footing. The positive attitude and motivation of the senior state forest officials from the Maharashtra State have coupled with state level workshops by NGOs such as FRLHT

and RCMPCC have fuelled the enthusiasm among Forest Departmentstaff at all levels and more remarkably at village and sub-district levels.

2.6.a.2: Decision-making process

The decision-making was strategic and vested with different stakeholders. The decisions with regard to deciding project sites or MPCAs were vested with State and district forest officials on the basis of criteria jointly evolved in State level workshops along with NGOs and professionals. The "Project Management Board (PMB)" – for Maharashtra State – has been constituted drawing representatives from the State Forest Department, FRLHT, other NGOs and academic and research Institutions, which has been active for more than four years and meets every 6 months. The community members were often consulted in most of the decision-making processes either through representation by SHG /LMC or RCMPCC.

For main community-related activities RCMPCC design and implement the agendas mainly through LMCs and SHGs. LMC and SHGs have been provided initial funding and autonomy to adapt programs locally, in consultations with local forest officials. The Deputy conservator of Forests – a senior most forest officials at the district level (DCF is empowered to oversee use of funds by LMCs and SHGs and sanctioning authority for approving the budget for the new proposals submitted by LMCs. The LMCs also keep informed the DCF through progress reports.

2.6.a.3: Conflict-management mechanisms

As such there is no specific conflict mechanisms designed in the project. However, the monthly review meeting at RCMPCC provides a platform for understanding the conflict causing issues by RCMPCC staff. The community organizers staff at RCMPCC are generally assigned different MPCAs . The community organizers would debrief LMC and if need be SHGs to resolve the issues. The Issues are generally discussed at length as part of agenda in the monthly meeting of LMCs and resolved collectively. Sometime the local forest officials are also playing important role in resolving the conflict if the nature of the issues are of direct concerned to forest departments such as penalizing the offender for illegal removal of medicinal plants etc.

2.6.a.4: Roles of enabling linkages in the development and success of the project:

Both horizontal and vertical linkages among various actors are important to the successful implementation and sustenance of the projects. The linkages are either directional specific (i.e. pointing which actor influence direct control over which actor at the other end) or magnitude specific (i.e. how strong/weak the link is) which help them characterized as one way /two ways and one strong/weak relationship bilaterally. These linkages are depicted in the following figure:

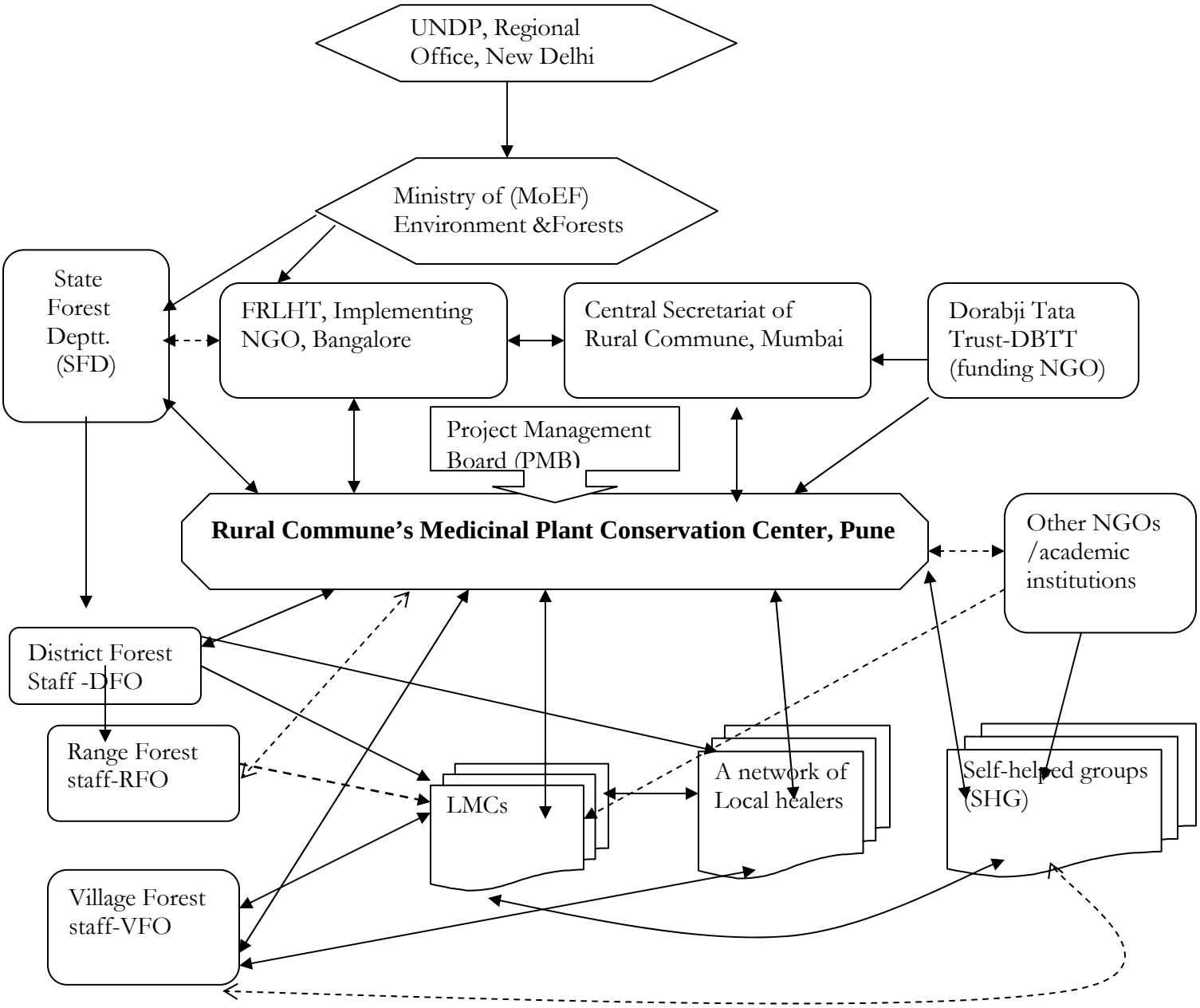

Figure 4: Enabling cross-scale linkages helped in the achievements of project goals

Keys:

⟷	Two ways strong links
<⋯⋯>	Two ways weak link
⋯⋯	One way weak link
⋯⋯	Two ways weak but useful connecting link
⟵	One way strong link

Vertically, the links between the Forest departments and RCMPCC /FRLHT at the state, district and sub-district levels are the strongest ones in successful delivery of the project components. The links between is RCMPCC and other NGOs at the state level is not such strong but useful

link in where RCMPCC can build upon their strengths in organizing activities at the district/sub-district levels.

Horizontally, the links between LMCs and SHGs are emerging. These links are local institutional responses to avoid the overlaps between tasks between LMCs and SHGs and are flexible to accommodate the emerging needs and concerns of LMC and SHGs.

Some of the links are weak but at the same time useful. For example, the links between RCMPCC and other state level NGOs such as Swayamsudhha, Sharamjivi and Amachi Arogya and up to certain extent DRDAs are useful in mobilizing training support for LMCs in herbal product development their processing and marketing. The nature of important linkages and their various outcomes are described in the following table:

Table 4: Important bilateral linkages and their outcomes in Cross-scale dynamics

Linkage between	**Outcome**
MoEF and FRLHT	Funding and Institution building support
FRLHT and RCMPCC	Project implementation, Vision exchange
FRLHT and RC	Enhancing capacities through mutual learning,
DBTT and RCMPCC	Bridge grant/funding for sustaining project activities
SFD and RCMPCC	Legal notification of project sites(MPCAs), Channeling official involvement at lower levels
RC and RCMPCC	Parent institution, Administration and overall guidance in project management
RCMPCC and DFO	District level monitoring of project activities particularly proposed and carried out by LMCs, formal institutional support in implementing project activities at district and lower
RCMPCC and LMC	Project management at village level, Feeding back inputs in design and delivery of project activities at higher level
RCMPCC and SHG	Organizing women for income-generation and health improvement
RCMPCC and Local healers network	Recognizing and rewarding local knowledge, Building stake of healers in conservation of medicinal plants , inventorization
DFO and Local healers network	Recognizing local knowledge through incorporation in management plans of forest department, Rewarding healers
LMC and SHG	Training and Marketing support to SHG by LMC
RCMPCC and other training NGO	Training and workshops for LMCs and SHGs
LMC and local healers network	Local knowledge in identifying priority species for nurseries and monitoring of forest cover, Informal network building
VFO and Local healers network	Recognizing and rewarding healers in local conservation and sustainable management of medicinal plants, inventorizations
VFO and SHGs	Channeling marketing of herbal drugs, providing information on making relevant herbs and their medicinal values

2.6.b: Learning and Adaptive Management

2.6. b.1: Evidence of adaptive learning through peer-learning and local innovations:

The experience of FRLHT in the southern states helped shape the project and ensure the fullest cooperation of the Forest Department and state government. The RCMPCC has taken up the responsibility of community organization and role of the state Forest Department was perceived to be more effective in the areas of deciding and legally notifying MPCAs, providing staff, vehicles and infrastructure support in the beginning etc. As the project progresses, the structure and membership of LMCs have been changed. Some of the LMCs have been modeled on cooperative foundation to take up the community-based marketing of herbal medicines. The dysfunctional members were altered in a few LMCs. The ties between LMCs and SHGs were made more clear and stringer in the subsequent phases of the project. The innovative initiatives of the LMCs and SHGs were encouraged by RCMPCC. A few such examples are provided in the following box:

Box 2: Examples of adaptive learning demonstrated by the village level management structures created during the project

- A SHG in the Koyna MPCA is preparing the dried *papadam* (round shaped big size nachos) using local varieties of a cereal known as *ragi* for local sale in the village. The taste became so popular in the village that demand was created in neighboring village and the local hotel owner convinced to include this recipe as a regular item for the visitors.
- In Amboli, MPCA, the collection of timber is done through a middlemen appointed by Forest Departmentthrough auction under the village panchayat's supervision. The LMC wanted to make use the high revenue that may be generated through the sale of locally valuable timber and approached the village panchayat to help them and persuaded the village panchayat to take over the sale of timber from private village person. This has helped LMC in generating some additional revenue, which was used for local medicinal plants conservation related activities.
- An interesting insight came up during the discussion. SHG' women after their hard toil in grinding the bark of *Baheda* (*Terminalia Chebula*) and *Harde(Terminalia bellerica)* , realized that their returns to the labour was not justified both in terms of money and time. The lack of electricity in the village prevented them to opt for power-run grinder. The desirable diesel-run or mechanical grinder was not available locally. The profit of sale of medicinal products were largely accrue to LMC, as per the routine norms and SHG's share was marginal. An innovative arrangement with LMC was thought out. According to this revised norm, the profit of the sale would come directly to SHG and not LMC. LMC's revised role was to provide guidance in preparation and marketing of produce and make arrangements for their sale through exhibitions or other such opportunities for which they would be paid by SHG. In a way, SHG had subcontracted the part of marketing operation to LMC. This has resulted in to larger profit share for SHG. This is only tried out at Toranmaal and other MPCA are also thinking of similar innovative strategies for equitable sharing of benefits and division of labour.

2.6.b.2: Monitoring of medicinal plant biodiversity through local capacity building

The important aspect of biodiversity conservation is involvement of local communities and awareness raising efforts of RCMPCC. Some of these activities for in-situ conservation may be worth noting for future possible improvement in the indicators of biodiversity conservation and shown in the following box:

Box 3: Evidence of local conservation efforts leading to improved monitoring and conservation

- 60 percent of MPCAs have Signage & Forest Trails.
- 11 Demonstration Garden for Public Awareness have been set up.
- 10 MPCAs have been equipped with basic interpretation center displaying exhibits on medicinal plants theme.
- The herbarium records for 804 species have been prepared. Some of locally available species records have also been kept with the local healers or village botanists at each MPCA. At few MPCAs these herbarium sheets were demonstrated in the village schools and visitors.
- 75 plants from all MPCAs have been systematically collected for raw herbal preparation.
- Enlistment of Threatened species – as a follow-up of Camp Process – Out of Threat Category of 54 candidate species 26 have been identified as rare and endangered species and out of which 24 are found in MPCAs.
- Seven MPCAs have nurseries establishments for the collection of planting material seeds or prioritized species from distribution range in the state.
- The exchange visits of LMC and SHG members were organized to update and inform LMC and SHGs members about the innovative experiments carried out by LMCs/SHGs. More than 50 LMC and 310 members of SHGs have been benefited from cross-MPCA exchange of ideas through exposure tours.
- Recognizing and rewarding outstanding LMCs and SHGs through certificate of appreciation and in-kind award for showcasing the best ways of improving conservation through local enterprise development.

The recording of unique species is another area. The CAMP exercises (for a brief description on a CAMP method, please see 2.2.b.2) helped identify unique species from the MPCAs and systematically mounting them for future preservation and botanical assessments. The unique species recorded through two intensive field visits and CAMP deliberations are described in the following table:

Table 5: Unique species of medicinal plants documented in MPCAs

Name of MPCA	District	Total unique plant species recorded in 2000	Total unique plant species recorded in 2001
Gadmauli	Gadchiroli	99	27
Nagzira	Gondia	103	25
Bhaskaracharya	Jalgaon	124	60
Yedshi Ramling	Osmanabad	138	50
Legapani	Nandurbar	155	92
Chichkund Deo	Nandurbar	123	76
Sawarna	Nasik	135	60
Amboli	Sindhudurg	109	89
Navaja	Satara	116	62
Borivali	Thane	152	44
Gullarghat	Amravati	167	45
Honya Koli	Pune	126	91
Amba	Raigad	96	75

2.6.c: Direct and Indirect benefits to the communities:

The creation of MPCAs, forest nurseries and activities helped enhance the local medicinal plants availability to local communities (Please see section, 2.6.b.2). This has resulted in improving primary health care of local communities through sustainable use of a wide variety of local medicinal plants. For example, data on medicinal properties and local uses is documented on around 326 plants. A database on unique treatments of around 265 illnesses covering 175 plants from Melghat MPCA and 68 plants from Toranmal MPCA has been developed. The project has also resulted in improving status and contribution of women in economic development activities through their own skills and knowledge recognized in preparation, processing and sale of medicinal plants (RCMPCC, 2003). The local management structures viz. LMCs and SHGs helped organize communities not only for conservation through sustainable use but also in protection of local medicinal plants diversity. The Forest Department thus benefited from ensuing commitment of local villagers in protection of forest resources. The Forest Department also included medicinal plants as focus for conservation and expanded its own vision and management strategies in their working plans.

The recognition of the outstanding local barefoot botanists, LMCs and SHGs through public honor and a certificate are the indirect benefits to the local communities and women in the form of non-monetary incentives for conservation of medicinal plants at local level. The creation of

more than 40 herbal home gardens in five MPCAs is another benefit to local communities, which has significant local aesthetic and medicinal values.

Another benefit to local communities is the organization and empowerment of the village women in the form of the self-helped group of women's in the nine MPCAs as described in the following table:

Table 6: MPCA-wise Self-helped Groups of Women created during project

NAME OF MPCA	NO. OF SHGs	NO. OF WOMEN
Gadmauli	4	40
Bhaskaracharya	2	35
Sawarna	1	41
Amboli	7	57
Navaja	4	40
Vasai	1	18
Honyakoli	2	30
Amba	5	>60
Toranmaal	2	40

Many of these groups had opportunity to participate in the training and exposure visits programs and subsequently improved their skills and knowledge in the collection and marketing of herbal products. Most of the SHGs have registered the profits, in some cases 3-4 times more than their initial investment funds of Rs 5000.

2.6. d: Livelihood improvement

As mentioned before, the initial funding provided to the local management structures for undertaking herbal drugs development and sale activity has resulted in a significant increase in the profits of village communities. Thirteen LMCs have more than two hundred villagers on board including about forty women members who have had direct access to the funds of Rs 50,000 to initiate income-raising activities. The SHG has provided unique opportunities to local women by improving their participation and income through herbal drugs collection, processing and marketing activities. The status of more than three hundred women in these MPCAs has been improved through various capacity building initiatives organized for the empowerment of SHGs.

If poverty is viewed as scarcity of resources and technologies to meet livelihood needs then the project has contributed to improvement of health care of the poorest of poor regions of Maharashtra state, where the access to modern medical facilities is inadequate and if available, quality-deficient. The establishment of nurseries, demo garden, nature trails, eco-tourism and other innovative activities by SHG/LMCs (Please refer, examples in the boxes of sections 2.6.b.1 and 2.6.b.2) have helped restore the traditional health knowledge and folk traditions associated with local health improvement. The savings available through creation and use of such local health improvement options could be alternatively used for livelihood improvement by poor and socio-economically disadvantaged communities in and around MPCAs.

2.6. e: Resilience of communities, livelihoods and management systems

The project has generated new co-management possibilities. For example, the Community at Amboli stopped the illegal extraction of Narkya plant (*Nothopodytes nimmoniana)* -a red listed species by outside traders. LMC inspired the village communities in Bhaskaracharya MPCA to prevent illicit cutting of the very highly traded species of sandalwood (*Santalum spp*) tree from the MPCA. The rural women Vasai MPCA disallowed illegal chopping of the tress in the MPCA. The people of the Gullarghat MPCA helped control excessive grazing by the villagers and outside herders. The LMC mobilized the local communities of Sawarna MPCA in community driven patrolling at night to protect the valuable medicinal plants and wildlife. These community-driven initiatives and stewardship could provide a ready platform for partnership with the Forest Department in sustainable management of forest biodiversity and ecosystems. The organization of village women in the form of self-sustained network of SHGs also provide a strong example to the government's rural development agencies and other local NGOs that women could be mobilized through linking conservation, development and their own knowledge systems.

The informal network of village botanists across all MPCAs have been used in joint scientific monitoring exercises such as CAMP and recognized by state forest departments as useful resources for knowledge-based conservation. The project has triggered new initiatives either by local communities (e.g. examples of innovative activities by SHG/LMCs provided in the section 2.6.b.1) or by RCMPCC (undertaking small enterprise development activities for LMC/SHG by procuring herbal drugs processing equipments).

The MPCA is emerging as a significant area harboring very significant medicinal plants. All MPCAs account for more than 46 of medicinal plants diversity of the state. The project has created a tremendous learning opportunities not only at local (village and district) levels but also at the state level. The Forest Department is planning to expand the concept of the MPCA in the other regions of Maharashtra and India.

2.6. f: Transferability of the lessons from RCMPCC as an EI case

There are certain lessons, which have, potential for transfer for the community-based conservation initiatives in more or less similar socio-political and economic settings.

The idea of creating and sustaining local management structures for conservation by promoting local use and sale is indeed innovative and worthy of experimentation. The RCMPCC has created and organized self-supporting structures like local management committees (LMC) and self-helped groups (SHG), which are building up their capacities to undertake local conservation and development activities on their own.

The concept of MPCA is also very innovative and replicable, which has prompted state, national and international governments to include MPCA as an emerging thrust area for their conservation and development interventions. The idea of transferring award money in the form of revolving funds to LMCs and SHGs had inspired LMCs and SHGs to undertake diverse and innovative activities to become self-sufficient. Many LMCs and SHGs have increased their

corpus funds using this revolving funds and created opportunities for institutions building by either providing a leadership (such as becoming a role model and local resource institutions for other 'de-funct' SHGs /LMC created by local government agencies/other NGOs) and their own capacity building (organizing exposure tours, participating in international herbal expos and identifying areas for training and marketing for the new potential herbal products).

The project has demonstrated that NGOs can inspire and engage the local communities and Forest Department in a productive and symbiotic partnership for conservation and sustainable management of medicinal plants diversity by encouraging local use and creating local opportunities to organize for livelihood improvement.

RCMPCC has also evolved, adapted and employed certain creative participatory methods by combining local and formal knowledge systems through their activities like the barefoot botanist or village botanist programs and local healer conventions (Shukla, 2003). The CAMP process has also demonstrated its worth in creating a platform where local healers and communities can work in the spirit of equal partnership with the formally trained field botanists in order to assess local medicinal floral species and evolve a plan for their recovery, if needed. These efforts represent the ways in which the local knowledge of healers and knowledgeable communities can be combined effectively with the formal knowledge of the field botanists and scientists.

The enterprise-based approach to medicinal plant conservation of RCMPCC, which was originally envisioned by FRLHT, had inspired a separate public limited company called the Gram Mooligai in the year 2000. The objective of Gram Mooligai is to generate income and new employment opportunities for poor rural communities through organizing community collectives for the production, bargaining and marketing of herbal drugs. RCMPCC is also experimenting and promoting the ex-situ conservation through a network of interested farmers and local communities through home herbal gardens, school herbal gardens and village herbal gardens.

Another lesson from the project was to bring the shift in the focus of the State and District Forest Departments from wildlife to medicinal plants in their conservation and development plans. The development NGOs could also see this as an opportunity for local development and conservation intervention where poor rural communities can be organized and engaged in collective action for conservation and local health improvement by generating local entrepreneurship and an innovative livelihood improvement option.

There are a few negative interactions at various levels in the cross-scale dynamics of the various stakeholders and more importantly at local level. For example, the sale of herbal drugs outside the mutually agreed physical boundaries by a SHG for a profit motive had generated some tensions among other SHGs and with in LMC members at one MPCA with regard to intellectual property and free riding. There might be other examples of the dynamic interplay among various homogenous stakeholders with varied interest and values. These lessons call for further examination through the lenses of learning before such interventions are recommended for wider replications.

3.0: SUMMING UP

In partnership with the forest department, the RCMPCC initiative had been able to achieve the goals of poverty reduction and biodiversity conservation through examples of self-organization and cross-scale interactions such as creating formal social networks like local management committee, self-help groups and local healers. As well, as described in previous section (2.6.f), there are other useful lessons or conditions for success of RCMPCC initiative. Some of the important lessons are summarized in the following table:

Table 7: Important lessons for learning from RCMPCC initiative

Enabling conditions/Lessons	**Examples**
Creating local management structures for conservation and sustainable use of natural resources	Creating local management committee(LMC and Self-help group (SHG), Involving forester as a secretary in LMC
Strengthening of local management structures	Institution revolving funds to LMC and SHGs, Orientation and capacity building workshops , exposure tours for LMCs/SHGs
Creating the long-term stake of the Forest Department / Governments in medicinal plants conservation	Developing concept of MPCA and its legal notification through Forest Department, Incorporating MPCA concept and botanical studies in working plans of Forest Department
Combining formal and local knowledge relevant to local medicinal plants through participatory ways	Village botanist / Barefoot botanist program, local healers wokshops, Hiring local healers as field study guides by formal botanists, Publications and dissemination of local language booklets on local uses of medicinal plants and a directory of local knowledge experts and their skills
Promoting alternative livelihood opportunities for poverty reduction by revitalizing local health traditions and local entrepreneurship development	Engaging SHGs/LMCs for locally-appropriate herbal products, facilitate marketing of herbal drugs through forest department's infrastructure and networking, Encouraging SHGs/LMCs in innovative income generating activities such as eco-tourism etc.
Creating Social learning by experimenting with innovative models of partnerships among various stakeholders	Setting up of Village herbal garden, demo gardens, network of local healers, home herbal gardens, school herbal gardens, forest trails on medicinal plants
Mobilizing local and international funding by building on successful models	Building partnership with other NGOs like FRLHT for UNDP-CCF grant, Ensuring bridging grant from Sir Dorabji tata Trust for program continuity

The project initially was organized through funding support from local trusts like sir Dorabji Tata Trust (SDTT) and formal support from international donors such as UNDP, coupled with a positive attitude and orientation of senior forest officials in the form of state level conceptual workshops. All these happenings facilitated formal institutional support from the Forest Department and in-kind support from local NGOs, other government development departments

such DRDA and most importantly, local communities. Women's empowerment achieved through their organization in SHGs is proving its viability through its emergence as a strong social network at the local level. The recognition of women healers and herbal drugs productions and sale by socially and economically weaker sections of women through SHGs and LMCs are carving out new niches for the existing gender-sensitive development and conservation efforts by transforming the traditional vision of women in local conservation and livelihood improvement activities. The project has instituted and experimented with new participatory methods like CAMP, village botanists programs and thereby combining local and formal knowledge systems, local healers' conventions, routing of revolving funds to LMCs and SHGs, training and capacity building of LMCs and SHGs, reshuffling responsibilities at local level, institutional building of LMCs as a role model capable to train other local level democratic structures, to name a few.

These lessons of community organization are useful in planning and implementing community-based initiatives of similar goals elsewhere. The successful implementation of a concept of MPCA and its legal recognition through Forest Department made national agencies like planning commission and international agencies like GEF to take note of such a compelling idea in their strategic management and planning for sustainable natural resources management particularly with regard to medicinal plants.

The RCMPCC initiative though young has started to demonstrate useful lessons as a community-based conservation initiative. It has built on a strong vision and firm foundation of a few sympathetic and dedicated individuals and NGOs like Foundation for Revitalization of Local Health Tradition (FRLHT) and a supportive government institution like the Forest Department. The platform for social learning was created on the synergistic and symbiotic sentiments and strengths of FRLHT, Rural Commune (RC) and the Forest Department. The project has created and sustained local management structures such as local management committees(LMC) and self-help groups (SHGs) and creatively engaged them not only in enterprise-based conservation of medicinal plants but also in developing a sense of ownership among the local communities. This sort of institution building efforts have generated a new opportunities of these structures to become partners with the forest departments in monitoring and sustainable management of local natural resources.

RCMPCC has evolved cross-scale linkages at various levels among different stakeholders. The dynamic interplay among various stakeholders in varying degrees contributes to establishing the functional relationships among them and creatively engages them in a social learning. Certain links like the one between RCMPCC and LMC and RCMPCC /SHG and the state/district forest departments are strong, making their outcomes more visible in meeting and sustaining the larger goals of revitalization of local health traditions and local conservation. Some of these links are not so strong but are still useful such as the one between local NGOs and RCMPCC for building local institutional support in the beginning. The local level interventions have generated new expectations and hopes such as like home herbal gardens, school herbal gardens. These innovations need to be backed up by funding for their capacity building until they become self-supportive.

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Appendix: 1: List of abbreviations

CBC:	Community-based Conservation
RCMPCC:	Rural-Commune's Medicinal Plant Conservation Center
RC:	Rural Commune
TEK:	Traditional Ecological Knowledge
SHG:	Self-help groups
LMC:	Local Management Committee
DCF:	Deputy Conservator of Forests
NGO:	Non-Governmental Organization
FRLHT:	Foundation for the Revitalization of Local Health Traditions
MPCA:	Medicinal Plant Conservation Area
CAMP:	Conservation Assessment and Management Plan
PCCF:	Principal Chief Conservator of Forests
CCF:	Country Cooperation Framework
DRDA:	District Rural Development Agency
DBTT:	Sir Dorabji Tata Trust
RFO:	Range Forest Officer
VFO:	Village Forest Office
SFD:	State Forest Department
IUCN:	International Union for Conservation of Nature
PMB:	Project Management Board