Learning from IDRC-supported Research for the
Conservation and Sustainable Use of Medicinal Plants:

A case study of a MAPPA funded project in Andhra Pradesh, India.

Project Visit: December 8 – 15th 2000,
to the Herbal Folklore Research Centre,
Thirupati, Andhra Pradesh.

by Carolyn Switzer,
Centre Intern.

Prepared for:
Medicinal and Aromatic Plants Program in Asia (MAPPA)
Sustainable Use of Biodiversity Program Initiative,
South Asia Regional Office,
International Development Research Centre.
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Executive Summary

In India, the South Asia Regional Office (SARO) of IDRC has supported several projects focusing on the documentation of indigenous knowledge related to plant-based medicines and the creation of incentives for the conservation of medicinal plants. One example is the long-term support provided to two associated projects in the area of Thirupati, Andhra Pradesh, first to the S.V. Arts College, and second to the Herbal Folklore Research Centre (HFRC) in collaboration with the People’s Clinic Trust (PCT).

In December 2000, the project was visited a research intern at the South Asia Regional Office of IDRC, in order to document and share the project’s key lessons in encouraging the sustainable use of medicinal plants within the participating communities. This report includes a comprehensive profile of the project in terms of ‘who, what, where, when and why’, and is intended to improve the dissemination of project results and experience and recommend future directions for the project.

The project’s key activities can be grouped under the categories of conservation and sustainable use; improving access to primary health options; and improved livelihood options. The following six activities are central to the project:

1. Documenting, validating and disseminating local knowledge of medicinal plants and herbal remedies;
2. Conserving medicinal plants by encouraging their cultivation in nurseries, and community and kitchen gardens, local forested lands;
3. Raising awareness of common ailments and locally accessible methods of treatment;
4. Increasing access to culturally appropriate health care by developing and distributing sample ‘traditional health kits’ and training local women and healers in the preparation of herbal remedies;
5. Providing training to local community members on the identification, sustainable harvest, domestication and cultivation of medicinal plants;
6. Supporting sustainable livelihoods through programming to increase local economic benefits from the harvest and production of medicinal plants and other non-timber forest products.

The HFRC project is held up as a successful example of a strong regional-local partnership that works to build local capacity in order to support locally defined research. Although the research agenda is highly contextual, there are significant lessons to be learned and shared with other organizations working at the grassroots, and funding agencies supporting research on medicinal and aromatic plants.

Transferable lessons for other MAPPA recipients include:

1. Strong leadership in the context of a multidisciplinary team with representation of both genders and the local community has been a key factor in the success of the HFRC project.
2. Ensure that community members possess a shared commitment to meeting project goals by building rapport with each community and establishing a long-term commitment to the mutual exchange of information, the project has remained tied to a locally defined research agenda.
3. Build strategic partnerships with other NGO’s, agencies and individuals that have existing capacity to address identified research needs in order to remain responsive despite a limited institutional capacity;
4. Create an obvious incentive to conserve and sustainably use medicinal plants by demonstrating the potential of traditional health practice to provide culturally appropriate and accessible health care, and alternative sources of household income.

Recommendations for future activities to be conducted by the HFRC include:

1. Improve collaboration with the joint forest management programs where they exist in villages participating in the HFRC project, in order to broaden the scope of species reintroduction and ensure broader and continued access of tribals to non-timber forest products.
2. Conduct a post project social and gender analysis in order to understand the impacts and outcomes of the project on the behaviours, relationships and attitudes of community members;
3. Develop an access and benefit sharing mechanism that will ensure the participant’s access to project results, credit for their contribution and an equal sharing in the benefits that derive from the project;
4. Build on past project support by selecting promising herbal remedies profiled in the case studies for further pharmacological studies;
5. Support the training and capacity building of traditional healers and improve their collaboration with public health sector (through local Public Health Clinics), in order to re-introduce traditional medicine as an option for improving marginalized community’s access to culturally appropriate health care.
1.0 PROJECT VISIT SUMMARY

1.1 Rationale for the Visit

The International Development Research Centre (IDRC) has a long history of supporting research related to the conservation and sustainable use of medicinal and aromatic plants (MAPs). Recently, program staff expressed a need for "...a clearer understanding of the real impact IDRC-supported research on medicinal plants has had and is having on sustainable use of biodiversity" (Leaman, 2000). This would invariably involve the collection of interim and post project information at the community level.

In India, the South Asia Regional Office (SARO) of IDRC has supported several projects related to the documentation of indigenous knowledge related to plant-based medicines and the creation of incentives for conservation of medicinal plants via their cultivation. One example is the long-term support provided to two associated projects in the area of Thirupati, Andhra Pradesh, first to the S.V. Arts College, and second to the Herbal Folklore Research Centre (HFRC) in collaboration with the People's Clinic Trust (PCT).

The information collected during the interim visit to the project site is intended to provide a set of ‘lessons learned’ that will inform the medicinal plant program review and enhance the creation of evidence-based programming and policies within the Program Initiative (PI). This report is intended to maximize the project’s impacts by revealing important lessons about how to create incentives for the conservation and sustainable use of medicinal plants. The report is also intended to improve the dissemination of project results by providing a detailed description of the project activities and results.

1.2 Project Summary

IDRC has supported two projects in the Chittoor District of Andhra Pradesh. The first, entitled “Survey of Plants with Reported Antifertility Properties based on the Herbal Folklore of Chittoor District, AP” began in 1994 and was completed in 1998. The Sri Vekateswara (S.V.) Arts College, Department of Botany, in Thirupati was the recipient organization and Dr. S. Vedavathy, a lecturer at the College, was the principle investigator.

Funding for the first project was originally provided under the International Medicinal Plant Network (IMPN), which ended in 1998. One tangible outcome of the S.V.Arts College project, was the establishment of the Herbal Folklore Research Centre (HFRC) in Thirupati in the first year of the project. In collaboration with the People’s Clinic Trust (PCT), the HFRC received funds independent of the S.V.Arts College in order to continue their efforts in a second phase. This second project was entitled “Strengthening the Traditional Health Practices and Training in cultivation of Medicinal and Aromatic Plants to the women and Herbal Healers of Chittoor District, Andhra Pradesh”. The two-year PCT/HFRC project began in January 2000 and has recently entering its second year. It is funded under the SARO-based Medicinal and Aromatic Plants Program in Asia (MAPPA) program, now in Phase II.
Phase I

| Title: | “Survey of Plants with Reported AntiFertility Properties based on the Herbal Folklore of Chittoor DT, AP” |
| Recipient: | S.V. Arts College, Thirupati |
| Location: | Thirupati, Chittoor District, Andhra Pradesh |
| Project Funds: | CAD $20,000 plus a supplemental $15,835 |
| Principle Researcher: | Dr. S. Vedavathy |

Phase Two

| Title: | “Strengthening the Traditional Health Practices and Training in cultivation of Medicinal and Aromatic Plants to the women and Herbal Healers of Chittoor District, Andhra Pradesh” |
| Recipient: | People’s Clinic Trust, Thirupati |
| Implementing Agency: | Herbal Folklore Research Centre, Thirupati |
| Duration: | January 1, 2000 to 2001 |
| Location: | Thirupati, Chittoor District, Andhra Pradesh |
| Project Funds: | CAD $28,196 |
| Principle Researcher: | Dr. S. Vedavathy |

1.3 Goal of Project Visit

To document and share the project’s successes and challenges in encouraging the sustainable use of medicinal plants within the participating communities. This will include a comprehensive profile of the project in terms of 'who, what, where, when and why' in order to improve the dissemination of project results and experience.

1.4 Objectives of Visit

1. To document the project goals, objectives, methodologies, activities, accomplishments to date and key lessons learned and to share these with other MAPPA small grant recipients.

2. To assess the extent to which the projects have:
   - enlisted the participation of local communities in the conservation, cultivation and marketing of medicinal plants;
   - enhanced the community’s understanding of common ailments and traditional methods of treatment;
   - increased the community’s access to medicinal plant resources and associated knowledge;
   - motivated and encouraged the community to conserve and sustainably use local medicinal plants

3. To interact with project participants in order to determine their perception of the project activities.
1.5 Activities and Methodology

The visit occurred on December 7th to 15th, 2000. Dr. Vedavathy and HFRC staff provided open access to participating communities and project activities, as well as technical and logistic support for the project visit. Primary activities included:
- reviewing relevant project documents;
- visiting project sites;
- interviewing project staff, traditional healers, community members/project participants;
- iterative group discussions with community members.

The two projects, first with the S.V. Arts College as the recipient and second, with HFRC, are closely related in that the later project builds significantly on the information collected and relationships established in the first project. As such, the impacts of each project cannot be adequately separated and the outcomes and impacts of each project will be examined together. The following table presents the agenda and key tasks of the project visit:

Table 1: Project Visit Itinerary

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec. 8</td>
<td>HFRC Office, interaction with Dr. Vedavathy and staff; Visit HFRC facility and local nursery; Visit to medicinal plant Garden at Mukkoti</td>
<td>Content analysis and literature review of project documents; Semi-structured interviews with staff (Dr. Vedavathy, V. Mrudula, Guravaiah and Madhu) and project advisors (Bhaskar Rao); Viewing of demonstration garden and nurseries.</td>
</tr>
<tr>
<td>Dec. 9</td>
<td>Village visits to remote Yanadi tribal community in Talakona foothills. Interaction with the Yanadi community, who have expertise in the use of medicinal plants and the collection of NTFPs.</td>
<td>Iterative group discussion with Yanadi tribals; Two interviews with community leaders (male); Two interviews with elderly female community members (who practice traditional healing methods); Interviews with local NTFP collectors.</td>
</tr>
<tr>
<td>Dec. 10-11</td>
<td>Attend Cuddapah Traditional Healers Workshop</td>
<td>Introductions to key contacts, NGO Partners, State Forest Department staff, and other project supporters; Interviews with several traditional healers;</td>
</tr>
<tr>
<td>Dec. 12</td>
<td>Sreenivasa Colony (tribal community). (HFRC has promoted kitchen gardens and trained women in herbal medicine preparation)</td>
<td>Visit project sites and kitchen gardens, interviews with project participants and NTFP collectors; Focus groups with participants in two villages</td>
</tr>
<tr>
<td>Dec. 13</td>
<td>Visit Rajula Kandriga, Snake bite herbal Centre</td>
<td>Interview with traditional snakebite healer; Visit People’s Clinic Trust medicinal plant garden; Iterative group discussion with participants; Visit kitchen gardens of participants</td>
</tr>
<tr>
<td>Dec. 14</td>
<td>Visit Kukkala doddi Yanadi Colony Visit Traditional Healer</td>
<td>Visit project sites and kitchen gardens, interviews with project participants and NTFP collectors; Interview with traditional healers</td>
</tr>
<tr>
<td>Dec. 15</td>
<td>Visit Tirumala to observe field setting and endemic medicinal plants in the field, forest</td>
<td>Field site visit with HFRCand NTFP collectors.</td>
</tr>
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by Carolyn Switzer, IDRC-SARO.
2.1 SITE PROFILE

2.1.1 Location

Andhra Pradesh (AP) is the fifth largest state in India, both in area and population. AP has a widely diversified agricultural base with a variety of cash crops. The agricultural sector accounts for 50% of the state’s income and provides livelihood for 70% of the population. The state is the largest producer of rice in India, and is the leading producer of cash crops such as Tobacco, Groundnut, Chilies, Turmeric, Oilseeds, Cotton, Sugar and Jute (India Profile Network, 2001).

Chittoor district borders the state of Tamil Nadu and is located in the Poini river valley. In 1997/98, 23.2% of the district’s 15152 square kilometres was under forest cover (State Government of AP, 2001). The Tirumala hills, which surround the city of Tirupati, are a part of the northern tip of the Eastern Ghats, a mountain range in south India that runs parallel to the east coast of Andhra Pradesh and is considered to be rich in biodiversity.

Source: Maps of India.

Project Visit to Thirupati, Andhra Pradesh, Dec. 6-15th, 2000. by Carolyn Switzer, IDRC-SARO.
2.1.2 Demography

As of 1991, 73.1% of AP's population lived in rural areas; 15.9% of the population was a member of a scheduled caste; and 6.3% was a member of a scheduled tribe (see table 2). India's scheduled tribes (ST) are defined as "...indigenous peoples who maintain their own distinct lifestyle, worldview and language" (India Profile Network, 2001). They are among the poorest and most marginalized communities in India, given their lack of access to resources and decision-making forums. Similarly, despite quotas and reservations established to empower groups marginalized based on their ethnicity, scheduled castes (SC) of India remain largely disenfranchised (India Profile Network, 2001).

Table 2: Population Statistics for Andhra Pradesh

<table>
<thead>
<tr>
<th>Year</th>
<th>State Pop '000</th>
<th>Rural Population '000</th>
<th>% of State Rural</th>
<th>Scheduled Castes '000</th>
<th>% of State SC</th>
<th>Scheduled Tribes '000</th>
<th>% of State ST</th>
</tr>
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<tbody>
<tr>
<td>1961</td>
<td>35983</td>
<td>29709</td>
<td>82.6</td>
<td>4974</td>
<td>13.8</td>
<td>1324</td>
<td>3.7</td>
</tr>
<tr>
<td>1971</td>
<td>43503</td>
<td>35100</td>
<td>80.7</td>
<td>5775</td>
<td>13.3</td>
<td>1658</td>
<td>3.8</td>
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<tr>
<td>1981</td>
<td>53550</td>
<td>41062</td>
<td>76.7</td>
<td>7962</td>
<td>14.9</td>
<td>3176</td>
<td>5.9</td>
</tr>
<tr>
<td>1991</td>
<td>66508</td>
<td>48621</td>
<td>73.1</td>
<td>10592</td>
<td>15.9</td>
<td>4199</td>
<td>6.3</td>
</tr>
<tr>
<td>1997 (Oct.)</td>
<td>73433</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
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2.1.3 Tribes of Chittoor District

The predominant tribal populations in the district, are the Yanadi, Yerukala, Nakkala, and the Irula tribes, although the Yanadi are the most populous in the area. With a population of approximately 267,200 in 2000, the Yanadi tribe lives primarily in the districts of Nellore and Chittoor. Approximately 10% of Yanadi are literate.

In terms of livelihood options, a large portion of tribals work as seasonal agricultural labour, and supplement their income by collecting seasonal forest products such as medicinal plants, herbs, wood, grass and other raw materials. Segments of the Yanadi population are semi-nomadic, moving every few years in search of agricultural labour or improved sources of forest products (India Profile Network, 2001). Although NTFPs are harvested seasonally and only on a small scale, they provide villagers with a large percentage of their disposable income. Minor forest products such as firewood, wood for house construction and medicinal plants are used for both subsistence and income-generation. NTFP collectors will typically sell a large portion of their harvest to local traders and retain a smaller portion for domestic use.

2.1.4 Historical Issues in Forest Management

Traditionally, the Yerukala and Yanadi tribes managed the fringe forest areas, and derived their primary source of livelihood from harvesting non-timber forest products such as medicinal plants. In 1887, the sale of forest produce was strictly prohibited by the British colonial government in order to ensure their undivided access to forest resources. The tribes were forced to the plains, where they were typically allocated small plots of secondary land for cultivation. After independence, the new Indian government reserved one third of India's land as forest to be governed and managed exclusively by the State Forest Departments. The Government tightened legislation making forest offences non-bailable and increased...
Within the last decade, state and civil society have recognized that conservation priorities cannot be determined or enforced in isolation from local communities, particularly forest-user groups. With this recognition, the Government of India (GOI) via the Ministry of Environment and Forests, issued policy guidelines for the integration of local communities and voluntary agencies in the regeneration of degraded forest lands in June of 1990 (TERI, 2001). The policy called for joint forest management (JFM) between the forest department (FD) and the fringe forest user groups, largely tribal communities in AP.

Currently, it is estimated that 10.24 million ha of forest lands are being managed under the JFM programme through 36,075 committees in 22 states. In Andhra Pradesh, a total of 6575 villages, covering an area of 16.32 lakh ha, have been identified as candidates for JFM programmes. Approximately 200 non-governmental organizations (NGOs) and volunteer organizations (VOs) are assisting these communities with the formation of a Vana Samraksha Samithi (VSS) - village organizations that will liaise with the FD in co-management of forest areas. To date, VSSs have been formed in 6575 villages in the state (SPWD, 1998).

The JFM allows local participating communities to plant trees for fuel, fruit, fodder and timber, as well as shrubs, fodder and grasses that aid in soil and water conservation. Medicinal plants may be grown according to the preference of the participating villages (SPWD, 1998).

2.1.5 Traditional Health Systems

Use of traditional medicine and plant based home remedies are widespread amongst indigenous peoples and dalit communities in the area. These health systems are essential to the rural communities of the state, given the lack of formal primary health care networks. Traditional healers, known as vaidyas, apprentice with their family members as the associated knowledge is handed-down through generations within families. Vaidyas typically depend on alternate income sources and offer traditional healing services as a secondary or tertiary income-generating activity.

Several traditional treatment centers exist in the district, typically operated from the homes of healers. Examples include a “Bone-setting Center” in the village of Kalluru; a “Herbal Centre for Mentally-derailed People” operating from Pedagundla Palli village, and a “Snake bite herbal Centre” operating from the home of Rajula Kandriga, a traditional healer near the village of KVB Puram. Knowledge and promotion of these centers are typically through informal information networks and word of mouth.

In addition to the work of vaidyas, women typically serve as health providers within the home, using traditional herbal and plant-based remedies that have been handed down through generations. Medicinal plants are largely harvested from fringe forests near the communities.
2.2 RATIONALE FOR THE PROJECT

2.2.1 Contribution to Ethnobotanical Literature

Of the 25,000 identified varieties of wild plants in India, an estimated 7000 species are used medicinally (Vedavathy, 1994). In India, traditional knowledge of local plant resources has evolved into culturally appropriate, widespread health systems such as Ayurveda, Unani and Sidha, which are largely botanical-based. At the local level, traditional healers continue to experiment with locally available plants, resulting in the creation of highly localized knowledge systems. Unlike formal systems such as Ayurveda, localized knowledge of useful plants in Andhra Pradesh and Tamil Nadu have received less attention and are far less documented.

Although the phytogeographic zone of the Western Ghats of India has received significant attention due to its classification as a biodiversity hotspots, only a few ethnobotanical studies have been conducted in the Eastern Ghats of Andhra Pradesh and Tamil Nadu. Also missing from the literature, is detailed information on the availability and accessibility of local people to the biological resources that form the basis of traditional health practice. The HFRC study proposed a contribution to the literature by collecting detailed information on locally identified medicinal characteristics of indigenous plants and identifying new plant material for pharmacological and clinical research.

At a national level, documenting the traditional knowledge and conserving diverse genetic stocks are important priorities for the Government of India. The following national research institutes are actively involved in research for the conservation and sustainable use of India’s medicinal and aromatic plant resources:

- the Central Drug Research Institute (CDRI),
- the Central Institute of Medicinal and Aromatic Plants (CIMAP),
- the Indian Council for Agricultural Research (ICAR) and
- the Council of Scientific and Industrial Research (CSIR) which supports the National Gene Bank for Medicinal and Aromatic Plants (NGBMAP),

2.2.2 Improved Primary Health

Over the last 30 years the national and state governments have increased efforts to bring primary health facilities to all districts, particularly to remote, marginalized communities. Although the effort was well intended, the state's endeavor to improve health access of the rural population by establishing PHCs has largely failed (Khan and Tamang, 1987; Duggal, et.al. 1995; Rao, 1998). In terms of the distribution of government health facilities, Andhra Pradesh had the second lowest per capita access of all Indian states in 1991, with 2.6 PHCs and 16.2 sub centers per 100,000 people (table 3). The per capita distribution of facilities for Andhra Pradesh fell below that of Bihar, one of the most disadvantaged states in India. Where these PHCs exist, the emphasis is typically on family planning and immunization (Duggal, et.al. 1995). State governments face the continuing problem of shrinking budgetary support restricting their ability to provide and expand health facilities that are critical to the health needs of the rural and tribal populations (Bhat, 1999).
Table 3: Distribution of Public Health Centres and Sub Centres in AP, Bihar and all India (average).

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<td></td>
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<td>7.6</td>
<td>0.9</td>
<td>9.5</td>
</tr>
<tr>
<td>India</td>
<td>1.2</td>
<td>6.4</td>
<td>1.1</td>
<td>7.9</td>
<td>1.1</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Number per 1,00,000 rural population; PHC: Public Health Centre; SC: Sub Centre.

Source: (Duggal, 1995).

Marginalized tribal and dalit communities in Andhra Pradesh face more significant health challenges than other segments of the rural population. The tribal population is characterized by a very high incidence of nutritional deficiency, maternal and under-5 mortality, in addition to a high prevalence of malaria and tuberculosis (Rao K.S. 1998). Their lack of access to health care facilities contributes to endemic poor health, as noted by K.S. Rao in 1998:

Health care services in tribal areas are far from satisfactory. The physical access of health care facilities is one of the major barriers for health-service utilization. The lack of accommodation, poor infrastructure, large-scale absenteeism and vacancies, poorly trained and unmotivated personnel and lack of maintenance are the main reasons for the near absence of health care facilities [in tribal areas].

Several studies throughout India have demonstrated that the supply of medicine at the PHCs is inadequate, irregular and non-need based, and that tribals typically viewed the doctors of the PHCs with very low credibility. As in Andhra Pradesh, this has resulted in the underutilization of the few government health care services that exist in rural areas (Khan and Tamang, 1987; Duggal, 1995; Bhat, 1999).

Given the lack of alternatives, the use of plant based traditional remedies to treat both common ailments and major life threatening diseases, is widespread amongst indigenous peoples and dalit communities in Chittoor District. However, the continuation of local health systems is increasingly threatened due to a number of complex factors, two of which are central:

- knowledge networks and traditional mechanisms necessary for the exchange of information are breaking down as vaidya apprentices are abandoning the practice for more profitable work;
- a lack of formal access to forest areas combined with rapid deforestation caused by over harvesting and exploitative trade of NTFPs has significantly impacted the availability of several species over the last 50 years.

Subsequently, not only has the network of PHCs never fully materialized as a solution to endemic health problems, the capacity of traditional systems of health, as well as the level of confidence in traditional therapies, have diminished as a result of competing health awareness campaigns. When this is paired with diminishing stocks of biodiverse medicinal plants and a rapidly declining knowledge base, the future health status of tribals is seriously threatened.

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2.2.3 Conservation of Forest Biodiversity

Rapid deforestation caused by over harvesting and exploitative trade of non-timber forest products (NTFPs) has significantly reduced the availability of medicinal plant material in Chittoor District over the last 50 years (Rao and Henry., 1996). The majority of local herbal remedies are based on wild botanicals harvested from secondary forests or degraded lands. Given the role of medicinal plants in the provision of primary health care and in income for local livelihoods there is an urgent need for the protection and enhancement of the diverse gene pool of plants with medicinal properties.

The HFRC proposed the conservation of biodiverse medicinal plants, as well as improvement of local health services, through a strategy of cultivation, domestication and reintroduction of particularly useful species. With this strategy, marginalized groups will maintain access to and control over plant material and will enhance existing skills for the sustainable management of such a valuable resource.

2.2.4 Sustainable Use of MAPs for Livelihood Improvement

The global trade of medicinal plants is in the order of US $800 million dollars per year (Hoareau and DaSilva, 1999). Of these marketable biological resources traded worldwide, only a small percentage come from cultivated stocks. The majority of plants are collected from the wild, typically using unsustainable harvesting methods. Given the market demand at local, national and international levels, there is significant potential to improve livelihoods and employment opportunities for marginalized groups who have recognized valuable characteristics of their local plants. Strategies for reintroducing economically and genetically valuable plants back into local forests, and cultivating them on local lands and in kitchen gardens are subsequently called for. Ideally, recognizing local innovations and time-tested methods will improve marginalized people's access to and control over biological resources, and will ensure their share of the benefits derived from biodiversity.

In support of this strategy, a similar ethnobotanic study by N. Rama Rao and A.N. Henry in 1996, classified local medicinal plant species and identified important aspects of plant utilization by the local population in Andhra Pradesh. The authors drew attention to the need for cultivation of useful species in and around tribal communities as a means to generate employment and income and prevent the depletion of wild stocks. The HFRC, with support from the Medicinal and Aromatic Plants Program in India, is working to address some of these issues.

2.3 SUPPORT FOR MEDICINAL PLANT RESEARCH AT IDRC

IDRC began supporting research activities in the area of medicinal plants in Asia in 1992 through the South Asia IDRC Medicinal Plants Network (IMPN). The first two phases of the IMPN focused on documenting and conserving medicinal and aromatic plants, developing projects and initiating networking activities among the research partners. Funding for IDRC’s first project in Chittoor District was provided under the IMPN, which ended in 1998. The AVS College project was a close fit with IMPN objectives in that it contributed significantly to documenting traditional knowledge of local plants with anti-fertility properties.

The current project with the HFRC received its funding under the first year of a new regional program, the Medicinal and Aromatic Plants Program in Asia (MAPPA) in 1998. MAPPA is a program of

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1 IDRC Medicinal Plants Network, IDRC project number 938311.
2 Medicinal and Aromatic Plants Program in Asia, IDRC project number 004359

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strategic research, networking and collaboration to comprehensively address key research issues related to the sustainable and equitable use of medicinal and aromatic plants in the South and South East Asia region. The program was launched on April 1, 1998 with co-funding support from the Ford Foundation, New Delhi and initially focused on continued support to existing IDRC funded projects in South Asia.

MAPPA-supported activities include strategic research to develop innovative conservation methods, promote sustainable and equitable commercialization, and improve options for safe and effective health care. The emphasis is on activities that incorporate gender and social analysis, benefit the rural poor and indigenous communities, and have the potential to influence policymaking in the area of biodiversity, environment and health.

The central objectives of MAPPA are:
1. To support strategic research on community-based initiatives for genetic conservation and sustainable management of medicinal and aromatic plants;
2. To promote innovative resource utilization and management strategies involving local people, especially rural poor and tribals, to derive more equitable benefits from medicinal and aromatic plants and products;
3. To support strategic research on improving access to, and use of, medicinal and aromatic plants as a means of safe and effective primary health care;
4. To support better access to, better quality, broader distribution, and greater utility of information about medicinal and aromatic plants through networking and communication; and
5. To promote partnerships, capacity building and institutional commitment to sustainable use and production of medicinal and aromatic plants through enhanced regional cooperation, training and research in the South Asian region.

As illustrated in the following sections, the HFRC project is a fitting subject for review, given that it addresses, to various degrees, each of the MAPPA objectives. The project is held up as a successful example of a strong regional-local partnership that works to build local capacity in order to support locally defined research. Although the research agenda is highly contextual, there are significant lessons to be learned and shared with other organizations working at the grassroots, and funding agencies supporting research on medicinal and aromatic plants.

2.4 PROJECT GOALS AND OBJECTIVES

2.4.1 Phase One

The first project in Chittoor District, entitled "Survey of Plants with Reported AntiFertility Properties based on the Herbal Folklore of Chittoor DT, AP" focused on documenting the local and traditional knowledge specifically related to medicinal plants with reported anti-fertility properties. With a small grant of CAD$20,000 provided through the IMPN project housed at IDRC-SARO, the first phase had the following objectives:

1. To collect ethno-medico-botanical information on medicinal plants in the area of Chittoor District of Andhra Pradesh.
2. To register the medicinal use of plants disclosed by:
   - villagers, particularly women given their common use of plant-based home remedies;
   - traditional healers (vaidyas) with long standing practice in herbal medicine; and
tribal peoples experienced in ethno medicine and the collection of wild medicinal plants for trade and home consumption.

3. To investigate and record the distribution pattern of plants, growth patterns, harvesting times and traditional methods used to evaluate reported medicinal properties.

4. To establish a research center in Chittoor District that will investigate the folklore of herbal medicines and act as a resource for training, networking, and dissemination of research results.

The investigation gave special emphasis to indigenous birth control methods and plants with reported anti-fertility properties, with the objective of informing new drug development and scope for further detailed, chemical and biological screening of herbal drugs.

2.4.2 Phase One Supplement
A six-month extension was granted in 1998 to HFRC in order to complete and continue tasks assigned in phase one. The objectives of the supplement period were as follows:

1. To continue collection and cross-referencing of herbal folklore with vaidyas in the western zone of Chittoor District;
2. To publish results of ethnobotanic survey conducted in phase one in a book entitled "Tribal Medicine of Chittoor District, AP";
3. To conduct workshops and awareness campaigns in rural areas of the district in order to raise awareness on the use, identification and cultivation of medicinal plants;
4. To conduct 30 case studies of popular therapies of the area;
5. To conduct safety and efficacy studies on selected folklore therapies having anti-fertility properties.

2.4.3 Phase Two
The HFRC received MAPPA funding in 2000 for a second phase project, entitled: “Strengthening traditional health practices through training in cultivation of medicinal and aromatic plants to the women and herbal healers of Chittoor District, Andhra Pradesh”. The second phase was to build significantly on the first, with the following objectives:

**General Objective**
To strengthen the traditional health systems in rural areas of Chittoor District by revitalizing indigenous knowledge and conserving biodiversity of medicinal and aromatic plants

**Specific Objectives**
1. to continue documenting herbal therapies practiced by vaidyas, women, and older people of Chittoor District and establish an inventory of traditional practice.
2. to assess the safety and efficacy of the selected herbal treatments already identified in the inventory.
3. to establish a demonstration garden and nursery that will be used for training and awareness raising and that will supply material to local farmers and women for cultivation in kitchen and community gardens.
4. to enhance local biodiversity by introducing important medicinal plants from other areas of South India into community and kitchen gardens of Chittoor District as well as the HFRC demonstration garden/nursery.

5. to select key plant species with low processing technology requirements and that are beneficial in the treatment of common ailments, prepare and distribute samples in 'herbal health kits' along with training materials and instructional information.

6. to continue with the training of vaidyas and marginalize people, particularly women from dalit and tribal villages, in the identification and sustainable harvest of selected medicinal plants, in low-input cultivation of specific species, and in the preparation and application of herbal treatments.

7. to determine the potential economic benefits of cultivating key medicinal plants, to encourage small scale cultivation of selected plants, and to organize a buy back facility in order to enhance the community's capacity for sustainable income generation while ensuring local access to biological resources.

8. to identify and assess methods for facilitating local access to diverse genetic resources and ensure the equitable sharing of potential benefits that may arise out of product development and marketing initiatives.

At the time of the project visit, the HFRC had completed its first year of Phase II and was entering its second and final year. Given the overlapping and connected objectives, the phases will be treated and discussed as one project unit.

2.5 METHODOLOGY

2.5.1 Research Team

The HFRC is made up of a small multi-disciplinary team composed of a botanist (Dr. Vedavathy, Director), a social anthropologists (V. Murdula, Coordinator), two trained taxonomists (A. Suhakar and U.V. Bhaskar Rao), an ayurvedic doctor (Dr. Dhanalakshmi, Consultant), and four field staff who are NTFP collectors from the local dalit communities. The team works closely together on all aspects of the project, and takes frequent advantage of the collaboration and feedback with external colleagues, advisors (such as other MAPPA recipients) and leaders of local NGO's.
2.5.2 Sample Selection

During the original phase, a broad ethno-botanical survey was conducted with a wide cross section of the district population in approximately 300 villages throughout Chittoor District. The surveys were carried out with a non-random, purposive sample of the rural population. Snowball and judgmental selection methods were used to identify community members who are knowledgeable in medicinal plant identification and use. The primary respondents were primarily local traditional healers, women and the elderly population, as they were identified as most likely to have direct knowledge related to traditional medicine.

Given the more demanding objectives of the second phase, the scope of the project was narrowed to 50 villages, with a focus specifically on the most marginalized segments of the rural population from within the dalit and tribal villages. Village selection criteria included those with poor access to primary health resources, especially the remote tribal villages, as well as those with relatively close proximity to secondary forests and those with traditional use of non-timber forest products.

2.5.3 Ethnopharmacological Survey, Focus Groups

By way of introducing the communities to the research objectives and gaining consent for participation, the team made initial contact with local NGO's that already existed and worked within the community. First introduction would then be followed with several informal focus groups and key informant interviews in order to gauge the level of awareness and use of medicinal plants existing in the community.

In communities without a prior relationship with a partnering NGO, Dr. Vedavathy and the research team would visit the village, make contact with and gain permission from the village head(s) to host a focus group in order to introduce the project's goals, objectives, methods and intended use of results. These focus groups would also be used to introduce concepts of confidentiality and to build rapport between the research team and community members. For the surveys, the team would use either a snowball sampling method, or when necessary, go door to door to identify key respondents. For case studies of local vaidyas, in-depth, unstructured and informal long interviews were carried out with a purposive sample.

2.5.4 Participant Observation

Participant observation often played a significant role in the research. The Coordinator, V. Murdula, is also in the process of completing her doctoral studies in anthropology focusing on the ethnomedical practices of the Yanadi tribe. As a component of her studies, she lived amongst the Yanadi tribals for over 4 months, building rapport and trust amongst several villages that participated in the HFRC project. Her experiences were critical to the development of the phase II proposal. Also, Dr. Vedavathy and field assistants would frequently stay in villages for a number of days, and would accompany the participants to forest areas in order to gauge the availability of each species, to directly observe the growing conditions, and to collect samples of each species. Hence, in addition to information gathering, 150 samples of rare and wild medicinal plants and, where possible, seeds, were collected for establishment in the demonstration garden and for germplasm conservation in the on-site herbarium.
2.5.5 Advisory Committee

A local committee of experts was established in order to verify species identification, assist with preparation of herbal remedies, consult on health-related matters such as recognition and diagnosis of common ailments and diseases, and to assess the safety and efficacy of local herbal remedies. The committee includes representative experts in Ayurveda, pharmacognosy, ethnobotany, and allopathy.

2.5.6 Focus on Gender and Social Relations

Previous literature and early HFRC field experience in the area indicated that the sustainable use of biodiversity, improved health and livelihood development can be brought about only with the cooperation of women. Early in the ethnobotanical surveys and awareness raising campaigns, the HFRC team recognized that women, especially those from marginalized communities, play a significant role in decision making around health planning and resource management for maintaining biodiversity. It was found that tribal women ...

- are typically primary caregivers as they are responsible for childbearing, child rearing, housekeeping, primary health care and other ‘reproductive’ tasks which nurture the health and general well being of family members;
- make the majority of decisions around household consumption and food and health provision;
- take on unpaid community work as informal health workers and nutrition advisors, as an extension of their care giving role in the family;
- cultivate useful plants in kitchen gardens and gather non-timber forest products with medicinal properties for domestic consumption and for exchange or sale in the local market;
- are resource managers and farmers in that they participate in planting, weeding, harvesting, post-harvest and marketing of agricultural and wild harvested raw material.

With this recognition, the HFRC focused on women and traditional healers as the primary respondents for the ethnobotanical surveys, and the primary participants in training and awareness raising campaigns.

3.0 SUMMARY OF PROJECT ACTIVITIES

Research supported by IDRC began with funding to conduct ethnobotanical and ethnopharmacological surveys of rural communities in Chittoor District of AP. The objectives and research needs for phase two evolved out of the observations of field staff conducting the surveys, and the direct expressed needs of participating communities. The activities, outputs and impacts of each phase, given their continuity, will be addressed together, and can be summarized as:

1. **Documentation of local knowledge and medicinal plant resources**: during the first phase of the project and the supplement, ethnobotanical and ethnopharmacological surveys were carried out in 1490 rural villages of the Eastern Ghats of Chittoor district.

2. **Case studies**: detailed interviews with village healers were required in order to collect specific information on traditional treatment methods, the challenges faced by vaidya’s and to strategize on improved forums for the exchange of ideas;

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3. **Improve primary health options:** given the lack of access to formal primary health, the research participants identified a need for improved access to affordable health care options. The HFRC responded with a plan for developing and distributing basic ‘herbal health kits’. In combination with this, the HFRC continued exploring options for the validation and safety testing of selected folklore therapies.

4. **Biodiversity conservation:** the HFRC recognized that the national and state government’s programs for Joint Forest Management would serve as an excellent vehicle for the reintroduction of threatened medicinal plants. Additionally, by cultivating domesticated species in kitchen gardens, community gardens and the HFRC demonstration garden, the project could contribute to the conservation of threatened species.

5. **Improve livelihood options:** respondents expressed a need for improved access to plant material for domestic consumption and sale in the local market. In response, the HFRC began offering training in cultivation, domestication and reintroduction of plants in the wild, in combination with training in appropriate technologies for the production of herbal remedies. Additionally, the HFRC has begun a market study on NTFPs and common use plants and established a nursery for the distribution of selected plants to farmers, collectors and users.

6. **Training and institutional capacity building:** The principal investigator of the recipient agency participated in several training opportunities and information exchange forums throughout South Asia. At a community level, improved training was requested in:
   - identification, cultivation and sustainable harvest methods of specific medicinal plants, particularly those that were perceived to be declining in availability;
   - development of community gardens and kitchen gardens in order to improve access to plant resources;
   - preparation of herbal remedies for treatment of common ailments.

### 3.1 DOCUMENTATION OF LOCAL KNOWLEDGE AND MEDICINAL PLANT RESOURCES

#### 3.1.1 Ethnobotanical Surveys

During the first phase (1994-1996) and its supplement, ethnobotanical and ethnopharmacological surveys were carried out in 1490 rural villages of the Eastern Ghats of Chittoor district. The survey party comprised of a taxonomist, anthropologist, indigenous field worker(s) and often community liaisons from supporting NGOs. During the second phase surveys were carried out with an additional 200 participants from approximately 50 villages concentrated primarily in western Chittoor district. The survey documented approximately 400 medicinal plant species found in Chittoor district.

The primary points of investigation were the identification and documentation of:

- the traditional taxonomy of species names and alternatives, as well as their probable meaning;
- local perceptions of availability of species and other ingredients over time, as well as changes in their use, demand, price etc.
- methods and parts for harvesting, impacts of seasonality, age of plant etc.
local medicinal uses of different parts of the plant and therapeutic agents for treating chronic ailments;
- methods of preparation, dosage and quantity, modes of administration, duration of the drugs used, potential side effects, diet restrictions, superstitions, contraindications, etc.;
- age and gender-differentiated perceptions amongst tribals and dalits of traditional health care and the disease(s);
- photo documentation and collection of live plant specimens and/or seeds for the demonstration garden and herbarium.

Tentative identification of species occurred in the field. The Botanical Survey of India, (Coimbatore) verified the authenticity of specimens. All specimens collected during the field visits and surveys were deposited in the herbarium and seedbank at the HFRC (see figure 1). Additionally, the second phase surveys provided an opportunity to collect more detailed information on non-timber forest products in the area.

3.1.2 Survey Findings

The publication “Tribal Medicine of Chittoor District, AP, India” (1997) was a significant output of the first phase. The book presents the findings of the surveys conducted from June 1994 to May 1996. Over 400 medicinal plants and the associated traditional knowledge of their medicinal properties were identified and recorded. Of those documented during the surveys, approximately 200 plants are presented in the book.

In addition to documentation of indigenous knowledge and local biodiversity, the HFRC collected information on the participants’ perspectives of indigenous medicine. Of the 200 families interviewed in the second phase, the majority of respondents over 50 years of age knew and used herbal remedies more frequently and maintained confidence in their therapeutic value. Although younger generations were less aware of traditional therapies, they remained largely dependent on herbal medicines for primary health care.

Where participants indicated high rates of use and a qualitative preference for traditional therapies, reasons cited included a firm belief that traditional therapies offered a permanent cure, despite a necessarily long duration of treatment. Secondly, traditional therapies were perceived to be cheaper, safer, more locally available and easier to administer. Third, the distance to hospitals and other formal health care facilities was prohibitive.
3.1.3 Project Visit Observations

During the December project visit, a focus group in the Srinavasa Tribal Colony revealed that the government’s campaign to raise health awareness and increase the use of PHCs discouraged the use of traditional methods, dismissing herbal healing as backward and rooted in unfounded ‘black magic’. Villagers and vaidyas remembered a state-sponsored vehicle mounted with a loudspeaker touring the remote villages, denouncing traditional methods and promoting the PHC over 40 kilometers away. Vaidya’s interviewed during the project visit also observed that there has been a decline in public legitimacy for their profession over the last 10-20 years, as reflected in the fact that the patients rarely pay for the services.

As a result, villagers interviewed during the project visit in December confessed to feeling hesitant in revealing and discussing their patronage of vaidya’s with the HFRC during the first phase of the project. Given that Dr. Vedavathy and several staff members are from urban centers and are members of higher caste and income groups, the tribal beneficiaries originally feared that they would be judged and ridiculed for their use of traditional methods.

Being aware of this challenge, the HFRC team strived to communicate their respect for traditional methods, their willingness to learn from them and their eagerness to establish a mutual exchange of knowledge, at the outset of their research. Dr. Vedavathy explained that her original approach for introducing the subject, was to identify herself as a ‘housewife’ who was born and raised in the area, and who used home remedies of her mother’s that had been handed down through generations. She would open a dialogue with the women in the community by sharing one or two of her own remedies before encouraging them to share some of their knowledge regarding local plants and remedies. She visits each community on a regular basis and has built a rapport with the community members. In addition, the fact that the multidisciplinary team included employees from the local tribal and dalit communities, increased the community’s willingness to participate in the study. After the first contact with each community, it was discovered that individuals continued to use traditional methods and maintain a relationship with the vaidya’s. By communicating a sincere respect for traditional knowledge, and establishing a unique rapport with each community, the HFRC team was able to meet the challenge of researching sensitive cultural subjects/belief systems.

3.1.4 Case Studies with Traditional Health Practitioners

Approximately 30 case studies of the traditional practice of vaidyas were conducted by the HFRC in Chittoor District. The objective of the case studies was to document details on traditional treatment methods through an unstructured long-interview and by observing the treatment itself (with the patients'
approval). Staff of the HFRC were introduced to reputed vaidyas in each village by community leaders, members who had participated in the ethnomedical-botanical survey, or by community liaisons participating in other aspects of the project. In each case study, both the practitioner and patient were interviewed, in order to document the case history, diagnosis, treatment and recovery of patients.

Staff at the People's Clinic Trust, a partner agency of the HFRC, were contracted to conduct several of the case studies. Results of the case studies were monitored by an Ayurvedic Doctor, a general physician and a psychologist all providing services as consultants to the project. All participating folk practitioners belong to marginalized communities (dalit and tribal villages). Twenty percent of those interviewed were women who were familiar with household remedies and practiced informally. Many of the practitioners specialize in specific diseases or families of diseases. The majority were not compensated financially for their services, but instead received in kind payments and supplemented their income with agricultural labour.

3.1.5 Project Visit Observations

During the December project visit, we had the opportunity of meeting and interviewing two vaidya's at their homes in Chittoor District (Figure 3 and 4). One, Dharapaneni Chalapathi, specialized in treating the victims of poisonous snakebites, and the second was a general practitioner - both had been the subject of HFRC case studies. Both healers maintained a small kitchen garden, which we toured, and harvested plants from the nearby Talakona forests when required.

One indicator of success for the project was the apparent relationship of trust and mutual respect that Dr. Vedavathy and her team had established with respondents. A degree of reluctance in information sharing pervaded the research in the first phase, given that the applied knowledge held by each practitioner has been handed down from generation to generation and is linked to a spiritual belief system that is foreign to western medicine. This is especially true of vaidya's who specialize in treating a particular condition. For instance, Mr. Chalapathi, the snakebite healer, works with a herbal remedy that is made up of approximately 60 plants harvested at various ages and from different seasons. He provided Dr. Vedavathy with information on only approximately 15 plants that have key active ingredients in the anecdote. However, Dr. Vedavathy noted a marked improvement over the course of the project, in the participants' willingness to share information. In the second phase, the majority of participating vaidyas were aware that all information offered would be confidential unless otherwise authorized by them. During the second phase, the vaidya's were surprisingly willing to share with Dr. Vedavathy information that is typically kept within families, and through her, with other vaidyas. This willingness evolved late in the project, after the participating vaidyas became aware of the significant potential to improve their practice if they shared information with other healers.

Figure 12: Dharapaneni Chalapathi, Snakebite healer with vaccine.
Early discussions with both the vaidyas and local women revealed that it was necessary to investigate the barriers facing the continued use of indigenous medicine. This need was again recognized during the December project visit. The following points were identified as common challenges to their practice during the case studies and again during the project visit:

- a decline in availability of specific plants primarily due to over harvesting to meet an increased demand for exportable plant stocks, as well as an increased lack of access to secondary forest land;
- plants that are viable and chemically active in one area may not be in another, hence the use of substitutes is common;
- general decline in the villagers confidence in traditional health systems due in part to a competing, rather than complementary public health awareness campaign that discouraged the use of traditional practice in favour of government supported Public Health Centres (PHCs) and Sub Centres (SCs);
- the viadyas observed that a lack of exposure and formal public sector support were resulting in a decline in their status and credibility.

A common theme throughout the case study interviews was an expressed need for assistance in organizing an association or other forum that will aid in the information exchange between healers, will build their credibility and status and assist in raising awareness of their services.

The recognition and incorporation of the issues of practitioners into the HFRC research activities have been key factors in building rapport between researchers and traditional health practitioners, which is critical in traditional health research. Dr. Vedavathy insists on a mutual exchange of knowledge, and offers her observations and lessons as a botanist to share with each practitioner. These simple practices have contributed to a strong program of research that is characteristic of a grassroots organization that has demonstrated a long-term commitment to a community.
3.1.6 Folk Medicinal Practitioners Workshop

The emerging willingness to share information was also observed during a local workshop for traditional healers in neighbouring Cuddapah District, for which Dr. Vedavathy was a guest speaker and resource person (December 11-12). The workshop was organized by the Multipurpose Social Service Society of Cuddapah (affiliated with the local Catholic Diocese) and several local NGO’s. Several resource people, such as practitioners from Ayurveda, Sidha and Unani, and an officer of the state Department of Forestry (A.K. Jain) was also on hand. The objective of the workshop was to focus attention of the community and government on local health practices. Over 100 vaidyas with a wide variety of specializations participated in the two-day workshop. Approximately 20% of the participants were women. During the breakout groups, healers were given the opportunity to share specific details of their top 5 remedies, including plant varieties and desired characteristics, preparation, and treatment details.

Dr. Vedavathy and several other resource people noted that this meeting was one of the first forums organized specifically for local vaidya’s to share information with a community of peers. Given that a significant number of local healers are illiterate and come from marginalized communities, the dissemination and sharing of knowledge is difficult. In terms of information sharing, the workshop was successful. The high degree of exchange was credited to the workshop going beyond a purely botanical interest in plants, to supporting the issues of local healers. Several vaidyas spoke of a general decline in confidence for traditional methods and their desire to receive recognition as health practitioners as well as support and credit from the government. Also, vaidya’s were interested in collaborating with the network of government primary health care centers that have yet to offer full services in rural areas.

Many participants reported that the workshop contributed significantly to building confidence in traditional methods and igniting discussion in the region on alternative options for safe and effective health care. It also had a direct influence on local policy. At the closing of the workshop, the Department of Forestry officer committed to working with local VSSs to improve local access to NTFPs. Also the state Diocese of the Catholic Church committed funds to support the training of 50 traditional healers with the HFRC.

3.2 IMPROVED PRIMARY HEALTH OPTIONS

Given the lack of access to formal primary health facilities (western, Ayurveda) for marginalized communities in Chittoor District, support of traditional health systems that are culturally appropriate, accessible and available, is critical. Supporting local vaidyas must occur simultaneously with a strategy to protect and sustainably use the diverse plant material that is the foundation of their practice. The HFRC is working for the combined objectives of improved health infrastructure and the conservation and sustainable use of medicinal plants through a number of activities. On the health side, this includes the following:

1. raising awareness of and increase confidence in traditional and local health systems by distributing sample ‘herbal health kits’ to marginalized communities in rural areas;
2. provide training in diagnosis of common ailments, in identifying disease landmarks and in the associated, time-tested botanical-based treatments;
3. providing training in the cultivation, sustainable harvest methods and low technology methods for processing of local herbal remedies;
4. increasing access to commonly used medicinal plants by distributing plant material for cultivation in kitchen gardens, community gardens and reintroduction to degraded common forest areas.

5. supporting the validation and safety testing of herbal remedies with modern, scientific methods.

Each of these are discussed in detail in the following section.

3.2.1 Training and Awareness Raising

During the second phase of IDRC funding, the HFRC began campaigns in the 50 participating villages, to raise awareness of the potential of local health systems to provide safe and accessible health care options. During the awareness raising campaigns, the HFRC would often distribute samples of traditional treatments in 'herbal health kits' (figure 5). Health kits typically include samples of herbal treatments such as:

- powder to prevent tooth decay;
- cream for calloused and fissured heals;
- dietary supplement for debility;
- an expectorant cough syrup for chest colds;
- conditioning hair oils;
- and topical applications for arthritis.

These campaigns helped identify individuals within each community who were particularly interested and supportive of the project activities, who would be ideal candidates for more specialized training in the following areas:

a. Traditional Health

Health training with community catalysts, predominantly women and vaidya’s, occurred in the following activities:

1. Identification of common ailments, their symptoms and landmarks (identifying when or if the illness has progressed to the point where external intervention, either with a medical doctor or an ayurvedic physician, is required). Training is conducted by an Ayurvedic doctor.

2. Preparation and use of herbal treatments conducted by Dr. Vedavathy and two Ayurvedic Doctors working with HFRC. Samples from the training workshops are supplied to communities in the form of herbal health kits (see figure 5).

Training workshops are typically held at the HFRC and last 2-3 days. Participants are bused to the HFRC and accommodated at a nearby hostel. Over 20 training sessions with 5-7 women participants each have occurred to date and with vaidyas, approximately 6 sessions have occurred. Recipients of the
training often serve as contacts and community liaisons for future HFRC involvement in the community. Also, the HFRC is currently developing a reference handbook of synonyms of diseases in local languages and in English.

b. Identification, Cultivation and Use

In order to ensure a locally available supply of biologically diverse indigenous plant material, the HFRC began offering training sessions for key participants from each village, in the following subjects in 20 villages of which 15 were Tribal colonies and five were dalit communities:

1. Identification of wild medicinal plants by a tribal NTFP collector skilled in the local taxonomy of medicinal plants and their uses (figure 6);
2. Domestication and cultivation of indigenous medicinal plants by agriculturalists and botany students of Dr. Vedavathy, trained by HFRC; and
3. where cultivation is not an option due to land scarcity or poor soils, the reintroduction and sustainable harvest of medicinal forest species.

Training in the identification and cultivation of plants occurs at the HFRC Demonstration garden in Chandragiri, or in the forestland of participating communities.

Figure 15: Identification and distribution of medicinal plants.
3.2.2 Demonstration Garden, Nursery and Herbarium

During the first phase, the HFRC successfully established a medicinal plant demonstration garden, which houses plant samples collected during surveys of traditional healers and local women. Three indigenous people with experience in NTFP collection and cultivation are employed in the garden. The 1.5 acre garden is on rented private land in Mukkoti, Chandragiri and is accessible to the general public and has the commitment of a supportive landowner. Approximately 150 varieties of medicinal plants have been established at the garden, which serves as an educational resource for training workshops. The garden also serves as an experimental farm, for standardizing methods of cultivating and domesticaing wild species. During phase II of the project, the garden was expanded to include a nursery, which supplies plant samples to participants for planting in community gardens. The nursery includes 40 varieties of medicinal plants used in primary health care, with over 5000 saplings prepared for free distribution.

The garden (figure 7) includes the following species: Decalepis hamiltonii, Ichnocarpus frutescence, Holarrhena antidysenterica, Gymnema sylvestre, Costus speciosus, Plubago rosea, Oroxyllum indicum, Pueraria tuberosa, Dillinia indica, Syzygium alternifolium.

In addition, samples of the live plants found in the demonstration garden have been included in a herbarium, which is comprised of approximately 450 varieties of medicinal plants used in and around Chittoor District (see figure 2).

3.2.3 Kitchen Gardens

The HFRC began distributing plants from their nursery during Phase I of IDRC funding. The objective was to encourage individuals in participating communities to cultivate medicinal plants in kitchen gardens and thereby ensure their access to safe and affordable alternatives for treatment of common and minor ailments. This objective was particularly important in extremely isolated and marginalized communities, where no formal health care options existed. By increasing the presence of indigenous but threatened plants in kitchen gardens, the HFRC also hoped to reduce the threat placed on wild species and improve the community’s access to useful plants. Combined with training and awareness raising, they also hoped to building confidence around traditional therapies. To date, the HFRC has encouraged the propagation of MAPs in kitchen gardens in 20-30 villages. Recommended plants must meet several criteria:

- do well in full sun, or in drought conditions and poor soils;
- are not consumed by grazing animals,
- require few, if any, external inputs;

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are easily processed with appropriate technologies,
• have established evidence of safety (non-toxic) based on historical use in the region and/or in formal traditional health systems such as Ayurveda, or from published documentation of toxicity testing, and
• are basic ingredients in widely known treatments for common ailments commonly used to treat basic, non life threatening ailments.

Plants were distributed to members of the community who had participated in awareness raising workshops and/or training sessions on the cultivation of medicinal plants and preparation of herbal remedies. In addition, in communities without partnering NGO’s, members of the community who demonstrated keen interest in the project were recruited to act as community liaisons to the project. They have agreed to disseminate project information to other participants, act as coordinators in terms of further training in the community, and if the community was too far from the demonstration garden, would often offer their gardens as demonstration plots.

3.2.4 Toxicity and Validation Tests

In 1998, the HFRC approached the Biology department of the Indian Institute of Chemical Technology (IICT) in Hyderabad to conduct toxicity and efficacy tests on 10 herbal anti-fertility treatments documented in phase I of the project. Five samples demonstrated slight toxicity and were rejected for study; the remaining 5 were evaluated for their antifertility and anovulatory activity in mice. Two of the five compounds showed anovulatory activity when tested in combination with estradiol. A third compound demonstrated anti-implantation activity that was thought to be due to the anti-estrogenic effect of the herbs. All compounds demonstrated antifertility activity ranging from 20-40%. Supplementary phytochemical, histopathological and haematological studies are required for further drug development. Given that a benefit sharing or intellectual property rights mechanism has yet to be established, the HFRC has not yet released the decoded list of compounds.

3.2.5 Project Visit Observations

We were able to visit three communities whose members had received plant samples for cultivation in kitchen gardens and training in domestication, cultivation of local species, and in the preparation of herbal remedies. In each community we held an impromptu focus group of approximately 15-25 members (with an balanced mix of men and women from various age groups) in order to discuss the participants’ perception of the project, of traditional methods, and their priorities for new directions for...
the project. In each community, participants welcomed Dr. Vedavathy and her team with enthusiasm and interest.

The semi-structured discussions often evolved into a focus on the ongoing health concerns of the community, as individuals approached us to discuss specific ailments, their symptoms and their potential treatment. The majority of participating villages are extremely isolated and marginalized, and have little to no access to government health facilities. In addition, given the lack of resources, there are endemic health problems associated with poor nutrition and poor sanitation. It is obvious then that their most pressing concern, put before plant conservation, is meeting the basic health needs of community members.

The conceptual foundation of the project clearly links the conservation of medicinal plants and traditional knowledge systems with primary health care delivery. A number of issues and risks are inherently linked to this. Given that the project uses primary health improvement as an incentive for conservation, there is a risk of the HFRC team becoming identifiable as primary health practitioners. For ethical as well as liability issues, the HFRC team must establish a clear protocol for how to address health awareness in marginalized communities. It is clear that the HFRC recognizes that, as an organization whose focus is on ethnobotany and the conservation of biodiversity, they have no capacity as a 'health provider', outside of basic consultative services offered by an Ayurvedic doctor. This doctor provides assistance in raising awareness and training in the diagnosis and identification of landmarks in symptoms that indicate when a patient can no longer self-treat, and should visit a medical doctor or Ayurvedic practitioner. The contracting of a local specialist is one successful way of expanding the reach of a project beyond the capabilities and capacity of the permanent staff at the HFRC.

The health function of the HFRC is therefore restricted to raising awareness of common plant-based, time-tested and locally available options for treating common and non-life threatening conditions, as well as the sustainable management of the resource base. The most common remedies promoted by the project include:

- a dietary supplement made from a variety of nutrient rich plants;
- a simple cream made from the pulp of a local plant and used to treat calloused and cracked feet; and
- a mix of leaves from local plants that is boiled in an infusion and used as an expectorant for chest colds.

Should the case arise where an individual is suffering from a condition that is beyond the scope of the select treatments, the team will recommend them to visit the nearest primary health facility. In the future, one priority would be to work more closely with these primary health networks at the village level.

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3.3 BIODIVERSITY CONSERVATION

In addition to the ex situ cultivation of medicinal plants in the HFRC Demonstration garden and nursery as well as kitchen gardens and community gardens in participating communities, the HFRC is encouraging in situ conservation activities. The HFRC has conducted basic studies on the sustainable harvest of wild medicinal plant stocks, and where possible, the reintroduction of wild species back into forest areas in collaboration with existing joint forest management programs.

3.3.1 Plant Reintroduction in Forested Areas

The HFRC has begun the process of liaising with the leaders of NGO’s, volunteer organizations and village leaders in communities where a VSS exists and JFM is under way, in order to encourage them to reintroduce native medicinal plants and trees into the degraded forest areas. Over 75 NGO’s have been contacted regarding their collaboration with the HFRC. Members of these NGO’s participated in a workshop held in Tirupati by the HFRC to develop strategies for collaboration. The HFRC currently works with three villages that are participating in the JFM program: Sreenivasa Colony, Sadasiva Colony and the Eswari Colony. Members of the VSS organizing committee and community liaisons have participated in HFRC training on the cultivation and reintroduction methods. Also, plants with soil conditioning properties have been supplied from the HFRC nursery to the VSS committee for reintroduction in the forest. Members of the participating communities have also received plant material for cultivation in kitchen gardens, training in cultivation and sample herbal health kits to promote the project.

3.3.2 Project Visit Observations

One site of VSS collaboration, the Srinavasa tribal colony, was visited during the December project visit. The colony is quite isolated, being a considerable distance from the main road. Subsequently, the access to formal health care facilities is virtually non-existent. The majority of villagers maintain kitchen gardens and harvest NTFPs for domestic use and local trade as a primary income source.

In the village, Dr. Vedavathy was warmly welcomed by participants, who led us to their kitchen gardens to highlight HFRC plants under cultivation. The VSS forest where HFRC plants had been reintroduced was a considerable distance from the village and could not be visited due to time limitations. We met the HFRC’s community liaison, who was the coordinator of an NGO partnering with the VSS, and had participated in HFRC training in medicinal plant identification and cultivation. He spoke with confidence and enthusiasm of the HFRC’s work and highlighted the efficiency with which the HFRC supplies much needed plant material for reintroduction into the degraded secondary forest. Over 25 species had been reintroduced into the forest area to date, and community members had taken a lead role in tending the ‘wild’ species. There is significant potential to collaborate further with the state’s JFM.
program, and reintroduce threatened species into degraded forest areas while ensuring sustainable rural livelihoods.

However, a significant challenge of working with the JFM program and VSS forests still exists for the HFRC. The displacement and the subsequent loss of access to forest products caused a drastic decline in livelihood options for the tribal communities and resulted in significant conflict between the tribal population and the government. Although efforts are being made to reconcile this relationship through JFM, a degree of apprehension still exists. Visits to the communities participating in the HFRC project revealed that many villagers still view the state forest department as a bureaucratic police force that regulates forest access. Similarly, the tribals continue to be stigmatized and isolated in society. The HFRC proposes to improve relations by establishing forums for the exchange of information and dialogue, such as the Cuddapah workshop, and offering training for both forest department workers and villagers.

3.4 IMPROVED LIVELIHOOD POTENTIAL

3.4.1 Sustainable NTFP Collection

During the second phase of the project, the HFRC initiated a study to document the existing and potential contribution of non-timber forest products (NTFP) to household income. The literature demonstrated that 60% of the recorded forest revenues are from NTFPs, while unofficial estimates indicate the portion to be considerably higher (Vedavathy, 1997). The study revealed that both tribals and members of the dalit community collect NTFPs and sell their harvest to middlemen contracted by a government-run cooperative society. The Girijan Cooperative Corporation (GCC) is the largest agency with exclusive rights to procure NTFPs. The local GCC has listed more than 50 plant species in their regular roster of collection. These plants are either purchased by Ayurvedic doctors in towns and urban centers or traded in national and international markets. Very few of these plant resources are purchased by local vaidyas, as they typically collect or grow their own ingredients.

In addition to those requested by the GCC, many other medicinal NTFPs are collected for local sale to independent contractors. In this case the price is not fixed and fluctuates based on necessity and availability, frequently resulting in over harvesting. Very few benefits from these biological resources are shared with collectors, who have no formal contact with purchasers or manufacturers. Instead, middlemen and independent contractors receive the bulk of the profits. NTFP collectors surveyed frequently expressed a need for assistance in integrating themselves further into the market chain in order to improve their livelihood options. The case study in Box A offers an example of field work conducted by the HFRC.

3.4.2 HFRC Activities

The HFRC began evaluating markets for local medicinal plants, and assessing the feasibility of cultivating or regenerating the forest population of economically viable medicinal plants. A market study began for 16 species with high exploitation rates; that are typically purchased by the GCC. Before recommending a plant for cultivation, it also had to meet several other locally defined criteria. This included plants that:

- do well in full sun, or in drought conditions and poor soils;
- are not consumed by grazing animals;
to the village, Nellimanda Girijan colony, which is in the fringe area of the forest. HFRC staff visited the village with the purpose of conducting awareness raising workshops on the use of medicinal plants.

The village is situated 70 km from Tirupati and the Girigan colony is 2 km from the main village. We reached the place at 2pm. Except for a few older people and children, the entire village went to the forest to dig 'maredu kommulu' (Decalepis hamiltonii). In front of every house we noticed the roots cut into pieces for drying. The old women guarding them told us that they sell these dried roots to the GCC at Rs. 3 per kg.

The people in the village are Yanadis and they are farm hands. During the summer season, when there is no agriculture activity, their sustenance is only gathering forest produce. If the roots are not available or after the completion of digging, they collect the vines of another medicinal plant – Tippa teega (tinospora cordifolia). These stems are cut into pieces and sold to the GCC. When we enquired about the use of these plants, they are unaware of the umpteen uses of the plants. The women told us that the roots are used for making pickles and the stem of the vine for preparing medicine to reduce fever. The roots of Decalepis hamiltonii is commercially valuable and a cool drink by the name of 'Sarasparilla' or Nannari is prepared in Rayalaseema area and the drink is in great demand. The tribals are not aware of the importance and value of the root. Even if they know, there is no way for them to improve the market potential.

The stems of Tinospora cordifolia is used in several 'ayurvedic drugs' and it is an immunomodulant and considered a medicine that gives immortality – 'sanjivini'. After the survey, we checked with the GCC and local herbal shops regarding the cost of the said products. A person can dig approximately 20-30 kgs of roots per day. For this, one has to walk 4-6 kms. The roots are dried for about a week and the dried roots come to 10-15 kilos. The GCC gives Rs. 3 per kilo (the travel expenses to reach the GCC is approximately Rs. 10) and the collector receives Rs. 20 for their labour. This means he/she is not going to get even the day’s wages for 6-7 hours of hard labour. When we told the people this, they said that they have no other way during the summer months since they depend only on the NTFPs for their sustenance. They have to sell at whatever price the GCC and the contractors quote.

(as documented by Dr. S. Vedavathy in the Phase I supplement proposal, 1998)

The following plants are a sample of those that will be assessed for their market potential: Withania, aloe, Mucuna, Andrographis, Piper, Cassia fistula, Bixa orellena, Cassia senna, Solanum Khasianum, Lawsonia inermis, Hibiscus sps. The HFRC has begun cultivating these species in their demonstration garden and nursery, in order to test their domestication and reproduction potential. Through these trials, the HFRC has succeeded in standardizing the domestication and regeneration practices for several species. The plants produced in the HFRC nursery also provide raw materials for training with local women in the processing and production of herbal remedies, the final product of which is distributed in the 'herbal health kits' during the HFRC's awareness raising campaigns.

At the time of the project visit, the HFRC had begun conducting workshops and training on the economic potential of specific herbs and herbal products, and were investigating options for providing

by Carolyn Switzer, IDRC-SARO.
plant material for cultivation on a wider scale. The HFRC is currently encouraging the small-scale cultivation of economically and ecologically viable medicinal plants in kitchen gardens for both domestic use and local sale. Should the level of production increase, marketing facilities and training will be required.

NTFP collectors also require assistance with the formation of promotional marketing boards that are distinct from commercial corporations and that will help in bridging the gap between the amount paid by the industry and what the gatherers receive. Such an organization could aid in the creation of equitable social contracts between collectors and the GCC, and inform NTFP collectors of their rights to access forest resources. In addition, further studies for the determination of sustainable harvesting levels are required in order to protect these plants.

The HFRC has proposed to establish a buy-back facility that will offer members of the tribal and dalit community a fair price for medicinal plants that are harvested/cultivated sustainably. The centre has also envisioned a plan to support small-scale enterprises that process common known medicinal plants and provide marketing assistance. Intellectual property is unlikely to be a concern where the focus is on commercializing commonly used herbal remedies. However, should future safety and efficacy tests reveal promising new marketable products based on local knowledge and innovations, a formal mechanism for sharing benefits derived from local knowledge must be agreed upon. Although the precise benefit sharing mechanism has yet to be designed, the HFRC is currently looking to other MAPPA recipients and external agencies for examples of applied ABS models.

3.4.3 Site Visit Observations

Of the five villages visited in December, two were extremely isolated tribal communities with endemically high rates of poverty and unemployment. The development of livelihood strategies based on their own innovations and locally available plants was an extremely well received concept. Participants who had received plant samples had began cultivation in kitchen gardens and had received training on cultivation practices. Although the plants are currently used for domestic purposes only, interviewed participants were eager to show us their gardens and anxiously anticipated the distribution of more plants.

3.5 INSTITUTIONAL CAPACITY BUILDING

3.5.1 Working with Local NGOs

In Chittoor Dt, more than 150 NGOs are interested in participating in training in medicinal plant identification, usage, cultivation and organizing medicinal plant gardens in their area of operation. HFRC has already conducted two meetings with contact people of the NGOs and they are ready for training and the receipt of traditional plants. In the KVB Puram (Kumara venkata Bhupalapuram) mandal, the HFRC is partnering with a local NGO to develop a medicinal plants garden and nursery on 1.5 acres of community land. Plants from the nursery will be distributed among the surrounding villages for planting in kitchen gardens.

Project Visit to Thirupati, Andhra Pradesh, Dec. 6-15th, 2000. by Carolyn Switzer, IDRC-SARO.
3.5.2 Building Capacity within Recipient Organization

One center wide objective of IDRC is to promote the building of institutional and individual capacity in partner agencies. This includes human resources such as researchers, graduate students, government employees and community members developed through the research project itself or training. The HFRC project succeeds in building capacity at the local and state level by:

- supporting the research skills of three local doctoral students in ethnobotany;
- enhancing the planning and managerial skills of indigenous community members through their participation as project staff;
- ‘training the trainers’ by enhancing skills and awareness of local NGOs already committed to working with local communities;
- building the direct resource management skills of local community members;
- reinforcing mutual interactions between Ayurvedic doctors and local practitioners;
- promoting information sharing and the enhancement of practical skills of local health practitioners;
- raising awareness at the state and national levels through the publication of research findings in popular journals and newspapers; and
- successfully influencing policy by raising awareness of local decision/policy makers (Forest Department officers, Church/Temple officials).

Additionally, the principal researcher of the HFRC project has participated in a significant number of training and capacity building opportunities, as illustrated in Table:

Table 4: Workshops/Training attended by Principal Investigator

<table>
<thead>
<tr>
<th>Title</th>
<th>Host</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Writing for Change</td>
<td>IDRC at the Centre for Indian and American Studies in Hyderabad, India</td>
<td>1998</td>
</tr>
<tr>
<td>International Conference on Medicinal Plants: Medicinal Plants for Survival.</td>
<td>IDRC and FRLHT, Bangalore</td>
<td>February, 1998</td>
</tr>
<tr>
<td>IDRC Network Meeting at Vital Mallya Scientific Research Foundation (VMSRF)</td>
<td>Bangalore</td>
<td></td>
</tr>
<tr>
<td>Preliminary Workshop on Germplasm collection, evaluation and Conservation in Andhra Pradesh</td>
<td>NBPGR Regional Station, Rajendranagar, Hyderabad.</td>
<td>April, 1998</td>
</tr>
<tr>
<td>National Workshop on Ethnoveterinary Medicine</td>
<td>ANTHRA in Pune, Maharashtra</td>
<td>June, 1997</td>
</tr>
<tr>
<td>International Conference on Ethnoveterinary Research and Development</td>
<td>BAIF in Pune, Maharashtra</td>
<td>November, 1997</td>
</tr>
<tr>
<td>Workshop on Biotechnological Interventions for the Improvement of Medicinal and Aromatic Plants, Natural Drugs and Herbal Cosmetics</td>
<td>Institute of Public Enterprises, Osmania University, and Acharya Ranga Agricultural University, Hyderabad,</td>
<td>April, 1997</td>
</tr>
<tr>
<td>Workshop on Gender Issues</td>
<td>Consortium of NGO’s of Chittoor District</td>
<td>June, 1997</td>
</tr>
<tr>
<td>International Training Workshop on Non-Timber Forest Products, Agroforestry and Models of Sustainable Forest Management,</td>
<td>Beijing, Peoples’ Republic of China,</td>
<td>September, 1997</td>
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by Carolyn Switzer, IDRC-SARO.
The principal researcher has been awarded the “Talented Scientist” award by the Sri Venkateswara University in recognition of her research accomplishments, during the 35th World Congress on Natural Medicines, March, 1997. In addition, Dr. Vedavathy became a member of the “Advanced Centre for Sanskrit and Science Studies”, Rahetriya Sanskrit Vidyapeetha, Tirupati.

3.6 DISSEMINATION OF PROJECT RESULTS

3.6.1 Publications

In addition to presenting project results and experiences at various workshops, conferences and meetings at the local, national and international levels, the principal investigator has contributed to the literature on the subject through both academic and popular mediums. The publication “Tribal Medicine of Chittoor District, AP, India” (1997) was a significant output of the first phase. The book presents the botanical and ethnopharmacological information of approximately 200 local plants from Chittoor District. Additionally, Dr. Vedavathy maintains a column in Telegu entitled “Mandu mokka” (“Medicinal Plant”) in the state newspaper, Andhra Joyti and is a regular contributor to the monthly publication: Annadata Swarna Sedam also published in Telegu. Several publications are written in local languages, the state language of Telegu and in English to ensure a broad reach.

Dr. Vedavathy has also contributed to the following journals:

- “Indigenous Herbal Medicines of Chittoor District, Andhra Pradesh”. Ethnobotany, International Journal for the Society of Ethnobotanists,

4.0 Summary of Challenges and Lessons

1. Devaluation of local health systems

The competing rather than complementary public health awareness campaign conducted by the state government, significantly stigmatized and devalued traditional health systems. The loss of confidence and legitimacy in traditional methods stemmed largely from local health systems being discouraged in favour of western medicine. This increased the risk of courtesy-bias errors in data collection, where the respondents feel compelled to express only the views they think the interview wants to hear. As a result, this posed a challenge to the collection of information relevant to the degree of traditional health practice, and the participants’ perception of use.

In recognition of this, the HFRC spent considerable time in each community in order to build rapport and establish a relationship of trust between researchers and participants. If this was not possible due to time constraints, the HFRC would work with NGO’s already committed to and established in the
community. The awareness raising campaigns, contributed significantly to building confidence in traditional health systems that was essential to encouraging participants to share information. The HFRC demonstrated a respect for traditional knowledge and encouraged a mutual exchange of information between researchers and participants. In addition, the fact that the multidisciplinary team included employees from the local tribal and dalit communities, increased individuals’ willingness to offer accurate responses to survey questions.

2. **Challenge of documenting traditional knowledge**
A significant challenge to documenting the local knowledge of local healers throughout the first phase, was the reluctance of vaidyas to share information. To some degree, this stemmed from a fear of losing control over proprietary knowledge. Also, a number of traditional remedies are linked with local belief systems making it difficult to replicate and document specific details of remedies and treatments.

The risk of undermining the position of vaidyas by demonstrating a lack of efficacy through clinical trials and other pharmacological testing is a challenge to the project. For instance, during the site visit I had the opportunity to discuss issues of safety and efficacy with Mr. Chalapathi. Dr. Vedavathy inquired of his opinion of western modes of efficacy testing and whether he perceived clinical trials as an appropriate test of his remedy. His response was “allow yourself to be bitten and I will prove to you that it is effective”.

The HFRC has addressed this challenge by building a rapport with each healer, demonstrating respect for traditional knowledge, ensuring confidentiality unless otherwise authorized, and demonstrating a commitment to supporting the issues and challenges facing practitioners.

To date, safety and efficacy testing has only occurred for remedies that are essentially common local knowledge, and not directly linked to the practice or local innovation of one specific vaidya. Until an appropriate benefit sharing mechanism or intellectual property recognition scheme is in place, this information should remain confidential.

3. **Isolation and Logistical Challenges**
The beneficiary communities working with the HFRC are marginalized communities, many of which are geographically isolated and far from main roads. When it is not possible for the HFRC to reach a community on a regular basis, the team establishes contact with a volunteer who is willing to act as a community liaison. The person receives training and support in all aspects of the program, in order to enable them to act as a contact person for participating community members.

4. **Lack of Visible Respondent Group**
The relative lack of visibility for traditional health services creates a challenge for sample selection. Unlike government-supported doctors, or accredited Ayurvedic doctors, vaidyas are neither certified nor accredited and are therefore not permitted to advertise their services in a conventional manner. To an outside researcher visiting the community on a short-term basis, these individuals are not easy to find. Sampling for interviews is typically via snowball and judgmental methods, where community members will identify individuals with particular knowledge or expertise in one specific area.

5. **Limited institutional resources**
The HFRC does not own land to support an adequate demonstration garden. The garden is currently rented from a private landowner. This restricts the ability to plan in the long term, which is a significant issue given the need to assess the long-term results of domestication trials and establish mature plants. The involvement of local NGOs and VOs such as the VSSs of the joint forest management initiatives,
offers opportunities to ensure the viability of the project in participating communities, given that a commitment has been made on behalf of the community to continue the project on community owned land.

Like many recipient agencies, there is a risk of the HFRC becoming dependent on IDRC as a singular source of funding. Fortunately, the capacity of the HFRC to sustain the research has increased significantly since the first phase, given the significant enhancement of research management skills. The HFRC is currently investigating other funding options, such as the potential of working more directly with the World Bank supported JFM program. There are also plans to propose a project to the Forest Department of AP to document the medicinal flora of the nearby Nallamalai hills (in the Eastern Ghats).

5.0. Transferable Lessons for MAPPA

1. **Strong leadership is critical**: The commitment, vision and energy of Dr. Vedavathy and all HFRC staff, is reflected in the relationship that has been forged between HFRC and participating communities. Strong leadership in the context of a multidisciplinary team with representation of both genders and the local community has been a key factor in the success of the HFRC project. Amongst other things, the participation of researchers from the local community helped ensure that the interview questions were well designed and suitable.

2. **Understand the local context**: The HFRC project is a strong example of an evolving research agenda based on the direct and expressed needs of the project beneficiaries. The project visit demonstrated that the community members possess a shared commitment to meeting project goals. By building rapport with each community and establishing a long-term commitment to the mutual exchange of information, the project has remained tied to a locally defined research agenda.

3. **Plan according to capacity**: Given the responsive nature of the HFRC, there is a tendency to plan activities that are beyond the scope of the project and capacity of the organization. In order to address the expressed needs of beneficiaries, the HFRC has built strategic partnerships with other NGO’s, agencies and individuals that have existing capacity to address identified research needs. The responsiveness of MAPPA’s small grant system allowed the project to develop in a way that permitted researchers to define new research goals and challenges and to identify other local actors with whom to collaborate.

4. **Link the conservation of biodiversity to meeting basic needs**: The predominant focus of the second phase project is on creating a linkage between health, livelihoods and the sustainable use of medicinal plants. By highlighting the potential of medicinal plant development to provide culturally appropriate and accessible health care and alternative sources of household income, the project has created an obvious incentive to conserve and sustainably use medicinal plants. The project is a successful example of creating a tangible link between these three objectives at the local level, and subsequently ensuring the buy-in of beneficiaries.

6.0. Recommendations for future activities

Given the responsive nature of the HFRC, new research needs are being identified regularly. However, the team should recognize the time and resource limitations and select only those activities that are high
priority and are well suited to their capacity. These should be developed in collaboration with MAPPA organizers. Based on findings from previous phases, additional research in the following areas is recommended:

1. **Improved collaboration with the state Joint Forest Management Program**
   There is significant potential to work more closely with the joint forest management programs where they exist in HFRC-participating villages, in order to broaden the scope of species reintroduction and ensure broader and continued access of tribals to non-timber forest products.

2. **Social and gender analysis**
   In order to assess the impacts and outcomes of the project, future surveys investigating the extent to which the project has directly influenced behaviours, relationships, and power dynamics in participating communities would be necessary. This would consider how the project has influenced the following factors:
   - the relationships between vaidyas and the community members/clients and state primary health care providers;
   - the extent to which traditional healers are willing to share knowledge of remedies and plants with peers and researchers;
   - participants’ access to project activities and resources with consideration to existing land tenure systems;
   - enhancing the perception of traditional health knowledge as a valuable community resource.

3. **Access and Benefit Sharing Mechanism**
   In view of the fact that the research is focused on documenting and applying the knowledge of traditional healers and their communities, it is critical that measures be taken to ensure that the healers and/or their communities share in any benefits that may arise from the use or sale of products. Without such measures, there is a risk that the research findings may be commercialized by parties outside of the communities, with no benefit accruing to them. The next phase should therefore develop an appropriate mechanism that will ensure the participant’s access to project results, credit for their contribution and an equal sharing in the benefits that derive from the project.

4. **Safety and Efficacy Testing**
   - build on early IDRC supported research by selecting promising herbal remedies profiled in the case studies and support additional pharmacological testing in order to establish and document the safety and efficacy of local treatments;
   - conduct studies to investigate issues related to the quality of raw materials and the potential risks of a decline in quality of medicinally active components associated with the domestication and cultivation of previously wild harvested medicinal plants;
   - address the issue of the potential threat of undermining the position of vaidyas should clinical trials and other pharmacological testing demonstrate non-efficacy or toxicity of a specific herbal remedy;
   - conduct a literature review of available documentation on previous clinical trials and pharmacological, biochemical studies on plants and active ingredients in herbal therapies.

5. **Support the development of community managed health delivery**
   The conceptual foundation of the project clearly links the conservation of medicinal plants and traditional knowledge systems with primary health care delivery. A number of issues and risks that are inherently linked to this should be investigated more systematically through the project. Given that the project uses primary health improvement as an incentive for conservation, there is a risk of the HFRC team becoming identified as primary health practitioners. For ethical as well as liability issues, the
HFRC team must establish a clear protocol for how to address health awareness in marginalized communities. The HFRC should avoid attempting to offer health delivery services, but focus instead on building the capacity of local healers by offering training, developing forums for the exchange of knowledge, and by improving and validating local herbal remedies. Also, the HFRC should attempt to improve collaboration between local vaidyas and the local PHC network in order to improve the potential of providing accessible, affordable, safe, effective and culturally appropriate health care in marginalized areas.

7.0 Conclusions and Discussion

The small grant program of MAPPA fills an important funding niche in that it allows for field-based discoveries to occur and for each research project to be responsive to the local context. The HFRC project demonstrates that successful conservation of medicinal plants in a specific geographic area can be achieved by supporting activities that strengthen local capacity to identify and address locally defined priorities and to clearly demonstrate the relationship of these priorities to biodiversity conservation. The following summary of activities demonstrates the very close fit between the program and project objectives:

- through its livelihood focus, work with NTFP collectors and joint forest management, the project has promoted innovative resource utilization and management strategies that involve local people and improving the equitable access to the benefits of the products of biodiversity;
- by offering raising awareness on local health options, offering training in the preparation of herbal remedies for common ailments, and ensuring sustainable access to necessary raw materials, the project has directly improve options for safe and effective health care;
- by focusing on the needs of women and marginalized tribal communities in Chittoor District, the project has directly benefited marginalized segments of the rural population and indigenous communities of India;
- the project has influenced local policymaking in the area of biodiversity, environment and health by raising awareness and confidence in traditional health systems and offering strategies for the sustainable management of biodiversity;
- ensure the continuity of project objectives beyond IDRC funding by demonstrating improved institutional and individual research capacity, and empowered local communities to sustainably use medicinal plants.


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