Medicinal Plant Conservation through Community Participation

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From ancient times, medicinal plants have been a source of curing ailments across all cultures. In many developing countries, traditional medicine is still the mainstay of health-care, and most of the drugs and cures used come from plants. Even in developed countries, the raw materials for manufacturing essential drugs are extracted from medicinal plants, using its natural properties of healing. Increasingly, more people are turning to herbal remedies, especially for treating minor ailments. Unfortunately, the inclination towards the revival and use of medicinal plants has resulted in undesirable outcomes. Medicinal plants abundant in supply are not infinite and with the widespread use have eventually caused depletion of this precious natural resource. There are no apparent and concerted efforts geared towards the conservation and wise-use of medicinal plants, the supply of which is dwindling given the threats of increasing demand, a rapidly increasing human population and rampant destruction of plant-rich habitats such as the tropical forests. At the current rate of consumption and use, the status of medicinal plants is threatened, risking our own future benefits and knowledge.

Today, many medicinal plant species of Bangladesh have reached the fate of extinction or severe genetic loss, but unfortunately detailed information and complete inventories do not exist. For most of the endangered species no conservation efforts have been implemented, and
a lion's share of the knowledge on their properties and use are held by traditional healer societies, whose very existence is now under threat.

IUCN Bangladesh, since 1998, has been implementing Community Based Floodplain Resource Management project of the Sustainable Environment Management Programme (SEMP) in several floodplains of Bangladesh in association with Bangladesh Centre for Advanced Studies (BCAS) and Nature Conservation Management (NACOM). One of the objectives of this project was to revert back the degraded conditions of natural resources of the selected floodplains, with the participation of local resource users.

The following report documents a community based initiative to conserve the medicinal plants of three SEMP project sites in the Padma-Jamuna, Brahmaputra-Shitalakshya and Madhumati Floodplains. This initiative involved the collection of baseline data on medicinal plants, motivating people toward the uses and practices, identification and knowledge sharing with the traditional healers and carrying out of specific conservation measures. This document also provides a number of recommendations to ensure the sustainability of such initiatives for safeguarding medicinal plants and indigenous knowledge associated with them. We sincerely hope that this account will be useful to the people and organizations interested in medicinal plant conservation, especially in developing countries.

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IUCN Bangladesh, in association with BCAS and NACOM, has been implementing the Community Based Floodplain Resource Management project under the SEMP in the Padma-Jamuna, Brahmaputra-Shitalakshya and Madhumati Floodplains. The conservation of medicinal plants is a prospective tool for biodiversity conservation and livelihood enhancement. Thus, special efforts have been geared towards their conservation and the knowledge associated with their use and practices in the above project sites.

We are grateful to the field staff working in the SEMP project sites, who have provided valuable inputs into the project in terms of data collection and promoting medicinal plant usage. Without their sincere efforts, the project interventions would not have been successful. We are also grateful to the local communities especially the traditional healers of the project sites who have made genuine attempts to save their culture and heritage and helped the project by selecting the appropriate medicinal plant species, and collecting mother stock of certain rare species without any remuneration.

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<th>Abbreviation</th>
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<tr>
<td><em>Amon</em></td>
<td>Rice planted before or during the monsoon beginning in July/August and harvested in November</td>
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<tr>
<td><em>Aus</em></td>
<td>Rice planted during March-April and harvested during July and August</td>
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<tr>
<td><em>Bazar</em></td>
<td>A permanent market of an area</td>
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<tr>
<td><em>Beel</em></td>
<td>A saucer-shaped depression, which generally retains water all the year around</td>
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<tr>
<td><em>Bhita</em></td>
<td>Purposefully raised land mass (mainly refers to homesteads, orchard, etc.)</td>
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<tr>
<td><em>Boro</em></td>
<td>Winter rice planted in December-January and harvested before the onset of monsoon in April-May</td>
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<tr>
<td><em>Ejmali</em></td>
<td>Community-owned land</td>
</tr>
<tr>
<td><em>FGD</em></td>
<td>Focused Group Discussion</td>
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<tr>
<td><em>FRMC</em></td>
<td>Floodplain Resource Management Committee</td>
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<tr>
<td><em>Haat</em></td>
<td>A big village market sits once or twice a week</td>
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<tr>
<td><em>IPM</em></td>
<td>Integrated Pest Management</td>
</tr>
<tr>
<td><em>IUCN</em></td>
<td>The World Conservation Union; International Union for Conservation of Nature and Natural Resources</td>
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<tr>
<td><em>Kabiraj</em></td>
<td>Herbal healer (Ayurvedic school)</td>
</tr>
<tr>
<td><em>Khas</em></td>
<td>Government-owned land</td>
</tr>
<tr>
<td><em>Madrasah</em></td>
<td>An Islamic school</td>
</tr>
<tr>
<td><em>PRA</em></td>
<td>Participatory Rural Appraisal</td>
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<tr>
<td><em>SEMP</em></td>
<td>Sustainable Environment Management Programme</td>
</tr>
<tr>
<td><em>UP</em></td>
<td>Union Parishad; the lowest local government unit</td>
</tr>
<tr>
<td><em>Upazila</em></td>
<td>The lowest tier of formal administration</td>
</tr>
<tr>
<td><em>VEC</em></td>
<td>Village Environment Committee</td>
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INTRODUCTION

Medicinal plants are an important part of natural wealth. They serve as important therapeutic agents as well as valuable raw materials for manufacturing numerous traditional and modern medicines. The history of medicinal plant use for overcoming diseases and related sufferings is probably as old as humans. Our ancestors were forced to use any natural substance that they could find to ease their sufferings caused by acute and chronic illnesses, physical discomforts, wounds and injuries, and even terminal illnesses. Since that ancient time, plants with therapeutic properties have occupied an important place in the disease treatment practices.

The *Rig Veda* (4500-1600 BC) contains the earliest mention of medicinal use of plants in the Indian subcontinent (Ghani, 1998). The *Vedas* made many references to medicinal plants, whereas, the *Charaka Samhita*, a comprehensive Indian Herbal, cites more than 500 medicinal plants. The total number of plants existing in the Indian subcontinent with medicinal properties is about 2,000 (Chopra et al., 1958, in Ghani, 1998).

1.1. Medicinal Plants in Bangladesh

Although a small country, occupying an area of about 147,570 sq km, Bangladesh is endowed with a very favourable climate for diverse flora. A great variety of plants grow in her forests, agricultural-lands, barren-lands, waste-lands, water bodies, and homesteads, and also by the
roadsides. Many of these plants, often considered as weeds, contain active substances with medicinal properties. It has been recorded that about 450 to 500 plants growing or available in Bangladesh have therapeutic values (Yusuf et al., 1994; Ghani, 1998).

The rich heritage of indigenous knowledge associated with herbal medicine is considered as the basis of all systems of traditional remedies in Bangladesh. Most of the medicinal plants of Bangladesh are extensively used in the preparation of Unani, Ayurvedic and Homeopathic medicines. These plants also serve as important raw materials for many modern medicinal preparations. Studies on medicinal plants in Bangladesh mostly include sporadic surveys in different areas of the country and registering of local use and associated indigenous knowledge. Since there has been no systematic phytochemical inventorying of the medicinal plants of Bangladesh, it is quite possible that many potential medicinal plants in this country still remain unexplored and are waiting to be assessed.

Unfortunately these valuable assets have been depleting rapidly because of unsustainable exploitations and can be attributed to the growing number of population in this country. Indirect detrimental effects include destruction of habitats of medicinal plants by converting forests and other lands into agriculture fields and settlements for extending urbanization or fast growing industries. These not only hamper species conservation but also threaten the occupation of herbal healers and the knowledge they bear. Multilateral Environmental Agreements (e.g. Convention of Biodiversity, TRIPS) demand safeguarding important natural assets like medicinal plants and associated knowledge. A number of Acts, Rules and Guidelines exist in Bangladesh for the protection of natural resources, which in some cases include medicinal plants. But these are apparently not succeeding in conserving medicinal plants as situation demands. On the one hand, over-harvesting of naturally growing medicinal plants has not been stopped; on the other hand, importation of medicinal plants/products continues, thus discouraging local production/cultivation of medicinal plants.
1.2. Participatory Medicinal Plant Conservation and SEMP

Medicinal plants and the traditional knowledge of their therapeutic properties are integral parts of the culture and heritage of a community. A shift from traditional agricultural practices to intensive ones to meet the demands of the ever-increasing population and over-exploitation have resulted in depletion of medicinal plant resources from the rural areas of Bangladesh. Given this situation, an effective way of conserving medicinal plants at the lowest social level, i.e. village level, would be involving the resource users, both the traditional healers and the actual users, of the villages in problem identification, solution recognition and also in taking up specific actions to reverse the trend. Community based natural resource management projects can be a sustainable way forward where such approaches can be advocated.

IUCN Bangladesh has been implementing the Community Based Haor and Floodplain Resource Management Projects under the Sustainable Environment Management Programme (SEMP) in five different wetlands of Bangladesh. Since its inception in the late 1998, a large number of activities have been taken to conserve and to ensure the sustainable use of valuable natural resources involving the people of the project sites. Given the importance of medicinal plants in the lives of the community people, one of the major interventions of the project was to focus on medicinal plant conservation in the SEMP project areas in the Padma-Jamuna, Brahmaputra-Shitalakshya and Madhumati Floodplains.

Aim

Medicinal plant resources and associated wisdom in the floodplains conserved with active community participation.

Objectives

- Baseline on medicinal plant resources of the project sites established.
- Community awareness about conservation of medicinal plants increased.
- Traditional healers identified and socially recognized.
- Availability of medicinal plant resources increased in the project area through nursery raising, demonstration plots/plantation and supply of stock to the community, especially traditional healers.

1.3. **Scope of the Report**

The present account documents the medicinal plant conservation initiatives taken under the SEMP in three floodplain areas of central Bangladesh. In addition to documenting the activities carried out, the report also highlights the impacts on individuals as well as on communities. Moreover, some recommendations have been made to ensure the sustainability of such initiative for safeguarding medicinal plants and traditional knowledge related to them.
SITE DESCRIPTION

The site selection criteria for the Community Based Haor and Floodplain Resource Management projects under the SEMP were based upon the benchmarks outlined in the SEMP Project Support Document. Two specific sites were selected from the haor and three from the floodplain areas of Bangladesh by considering their physical, hydrological, social, biological and management criteria.

In terms of medicinal plant conservation, the extent of traditional medicinal practice and potential of medicinal plants to be a vehicle for biodiversity conservation and livelihood enhancement induced the site selection. Accordingly, all the three floodplain project sites of the SEMP were chosen for participatory medicinal plant conservation activities. At the beginning, two sites, namely Arua and Gopinathpur Beel areas in the Padma-Jamuna Floodplain and Chanda Beel area in the Madhumati Floodplain were selected for promoting medicinal plants along with other floodplain resources. Later, medicinal plants became an important area of focus at the Trishal and Kapasia sites of the Brahmaputra-Shitalakshya Floodplain. One medicinal plant nursery was established in the Jamalganj site under the haor component of the SEMP, but community-based approach for conservation of these plants was not taken per se. The details of the selected floodplain sites for medicinal plant conservation are briefed in this chapter.
2.1. Padma-Jamuna Floodplain

The project area in this floodplain includes Arua Union of Shibalaya Upazila and Gopinathpur and Kanchanpur Unions of Harirampur Upazila in the district of Manikganj, Bangladesh. The GPS reading of Arua (Arua Union Council Office) is latitude 23°45'47" N and longitude 89°51'53" E. Arua Union consists of 24 villages and has a population of around 13,800, while Gopinathpur Union has nine villages and a population of about 13,000. Kanchanpur Union is composed of seven villages and hosting a population of around 7,250. All the sites are situated at the lower reaches of the Jamuna basin and at the confluence of the Jamuna, Padma and Ichhamati Rivers (Map 1).

The area represents a typical floodplain ecosystem of Bangladesh. In Arua, open agricultural fields are encircled by villages, consist of adjoining homesteads. Every year, the open land is inundated in the seasonal flush of water, giving Arua the unique characteristics of both aquatic and terrestrial ecosystems. The lowest part of Arua Union forms a beel, Arua Beel, which retains perennial water. Gopinathpur Union is also characterized by the presence of an extensive wet area, called Gopinathpur Beel. This beel retains water during the dry seasons, but sometimes is drained out for cultivation of boro rice in winter. Gopinathpur Beel basically represents the old course of the Padma River. All the nine villages of the union surround the beel, except the southern part that faces the River Padma.

Map 1. Arua, Kanchanpur and Gopinathpur Unions – the SEMP project sites in the Padma-Jamuna Floodplain, Manikganj. (Source: CNRS, GIS Unit)
but the depth varies from 1 to 4 meters in rainy season. The initial flooding occurs in late May due to local rainfall and later due to the back up water from the river and monsoon rains. The peak flooding occurs during August-September, the maximum flooded area extending up to 1000 acres. The water starts to recede around the middle of October, leaving a major part of the floodplain exposed. There are about 30 excavated pits (locally called khada or kanda) scattered in this area. Many of these hold water in dry season and act as a refuge for resident fish species of the floodplain.

The second project site in the Brahmaputra-Shitalakshya Floodplain is Nali Beel of Kapasia Upazila, Gazipur District (Map 2). A part of Nali Beel has been included in the SEMP project and spans five villages, namely Mashak, Fulbaria, Palashpur, Durgapur and Kamra of Durgapur Union. This project area covers an area of about 11.36 sq km, and has a total population of around 12,000.

Nali Beel is an extensive network of interconnected individual beels, locally called ghop, and represents an extensive low-lying floodplain area in the locality with some perennial pockets of water in the individual ghops. The beel is surrounded by a number of hillocks, on which the homesteads are located, forming the village lines. The Lakhia River, a tributary of the Brahmaputra, flows on the east of Durgapur Union and is connected to Nali Beel by two canals.

In the lean period, most parts of the floodplain area dry out, leaving about 30 acres of perennial waters. The initial flooding of the beel is caused by local rainfall during April-May. Complete inundation of the floodplain occurs by mid July due to local rainfall and floodwaters from the Brahmaputra, when connection between the river and floodplain is well-established. Peak flooding occurs in August-September, and the area becomes flooded with water depths ranging from 0.6-2.7 m and gradually starts receding between late September and early October.

The soil of Boka Beel and Nali Beel is alluvial; but in the latter area it is slightly reddish in colour and acidic in nature. The cultivation of traditional amon variety of rice has significantly reduced in recent years and grown only in very limited scale in the peripheral areas of the floodplain during monsoon. Improved varieties of boro are grown extensively during pre-monsoon period, along with moderate horticultural practices.

Plant diversity has seriously declined over the last two to three decades in these areas and indigenous wetland trees, like hijal (Barringtonia acutangula) and karoch (Pongamia pinnata), which were once abundant are now almost lost. Homestead vegetations are important in the Boka Beel area for the survival of local species. Although, there is no designated forest area as such in the Nali Beel area, some newly afforested areas dominated by sal (Shorea robusta) are to be found there.
Map 2. The SEMP project sites in the Brahmaputra-Shitalakshya Floodplain, (above) Boka Beel in Trishal, Mymensingh and (right) Nali Beel in Kapasia, Gazipur. (Source: CNRS, GIS Unit)
There has been serious degradation in the local biodiversity and in the environment as reflected in the situation in the beels and canals, reduction in natural vegetation, decline in fish production and low abundance of wildlife and other animals and plants.

2.3. Madhumati Floodplain

Chanda Beel, located between latitude 23°08’ and 23°15’ N and longitude 89°15’ and 89°59’ E, is one of the most important beels in the Madhumati River floodplain ecosystem in the south of Bangladesh, and contains most of the villages under the SEMP project (Map 3). It is an interesting wetland occupying a relatively less disturbed floodplain of the inland open water system. The beel lies within the Madaripur-Gopalganj peat basin and is surrounded by a number of important roads on three sides except the east side, which is exposed to the Madaripur Beel Route Canal (MBRC). The Kadambari-Chowaribari Beel complex is also situated in the Madaripur-Gopalganj Beel depression on the east of MBRC. The project site in these beels covers 31 villages, eight unions (Ujani, Kasalia, Nonikhir, Satpara and Jalipar in Chanda Beel, and Khalia, Kadambari and Rajoir in the Kadambari-Chowaribari Beel complex), three upazilas (Muksudpur, Gopalganj Sadar and Rajoir) and two districts (Gopalganj and Madaripur). The population of the project area is more than 30,500.

Map 3. Chanda Beel and Kadambari-Chowaribari Beel complex- project sites of the Community Based Floodplain Resource Management Project of the SEMP in the Madhumati Floodplain. (Source: BCAS, GIS Unit)
The water level of the *beel* is mainly governed by the water levels in MBRC, but seasonal rainfalls also contribute to its levels. The physical and hydrological features and processes of this floodplain differ significantly from those of other wetland ecosystems. Seasonal variations from predominantly aquatic to predominantly terrestrial environment are the result of large annual fluctuations in river and floodwater. During the monsoon (from June to October) the Chanda *Beel* area remains inundated with water deep up to three meters. The *beel* is connected to the adjacent MBRC and the adjacent Kumar River by sixteen canals. In the wet season, the *beel* harbors a number of species of finfish, several species of prawns, bivalve molluscs, gastropod molluscs, frogs, turtles and aquatic snakes. The *beel* also supports a large variety of aquatic plants. Similar diversity could also be seen in smaller Kadambari and Chowaribari *Beels*.

At the end of October, the water starts to recede from the *beels*, and by December most of the *beels* becomes dry except some natural trenches and artificial ditches as perennial water pockets, locally know as *kua*. These water bodies are dug by the landowners to allow fish and prawn to take refuge for subsequent harvesting. During the dry season, the land is basically used for agriculture, especially for rice cultivation. Moreover, in some parts of the *beel* a layer of peat is found. The local people extract it to use as fuel. The ecology is massively influenced by the alternation between aquatic and terrestrial phases.
CHAPTER 3

APPROACH

The approach for conservation of medicinal plants under the SEMP project was 'participatory'. Being one of the pioneers in community based medicinal plant conservation initiatives, innovative field based conservation approaches suitable for rural Bangladesh were implemented through this project. It was not only based on community knowledge but also a community driven initiative, involving the local people of the sites. The community was involved in the process of conservation from the inception of the project, focusing on experience-sharing among the traditional healers and reviving their socio-economic standing in the community. In terms of conservation, both ex situ and in situ conservation measures were considered for safeguarding medicinal plants. Finally, the approach aimed at promotion and use of medicinal plants in the project sites facilitating improved health conditions for the local community, enhanced livelihoods for the herbal healers and sustainable management of this natural wealth. This chapter is based on excerpts from the approach book on medicinal plant conservation prepared under the floodplain component of the SEMP.

3.1. Based on Community Knowledge

Since the status of medicinal plant was unknown for the project areas, the SEMP targeted the community, with the intention of cashing on the indigenous knowledge available within the
community. Therefore, PRA and FGD exercises focusing on medicinal plant resources and associated traditional knowledge were conducted in the project sites. Prior to that, in the early stage of the SEMP, the project staff undertook a reconnaissance survey over the project sites for collecting information on medicinal plants. All of these exercises helped in the creation of a knowledge base, the prerequisite for any conservation initiative. This approach was found positive because the community, as an authentic source of information, felt a sense of ownership from the very beginning, making the task of community mobilization much easier.

3.2. Community Driven Initiative

The effective identification of medicinal plants by the community members indicated that they were the main players who could play an instrumental role in conservation. One of the major approaches taken by the SEMP was thus to ensure community ownership of the medicinal plant conservation initiatives so that the practices are sustainable even after the completion of the project.

Experience-sharing through group consultations is the most effective tool for identification of specific needs of the community and designing appropriate intervention measures. Against this backdrop, meetings and workshops were arranged for medicinal plant conservation, emphasizing on the conservation values of medicinal plants. Other awareness activities included campaigns among students, installing billboards, publishing leaflets, staging folk dramas, and so on. The people were motivated to consult traditional healers before using medicinal plants, which helped people identify alternative and effective healing practices from the same plant. For the medicinal plants that required total destruction while using, a careful and only need-oriented approach was assured.

3.3. Appreciating Traditional Healers’ expertise

Traditional healers are the keys to the identification of native medicinal plant species, their utilization regimes and the pertinent conservation measures. Therefore, a special effort was made to accumulate available information on medicinal plants of each locality, through interactive discussions with the respective communities. The SEMP project recognized the fact that the social status of the traditional healers is on the decline and without support of the
community, their knowledge would be completely eroded. That is why social recognition of the values of the traditional healers and the knowledge they possessed was very important. This has been another underlying cause for giving exposure to the traditional healers and has been a major strategy towards the road to medicinal plant conservation.

3.4. Ex Situ and In Situ Conservation

To re-introduce medicinal plants in a locality, a mother stock is necessary, from which many progenies can be propagated. For this reason central medicinal plant nurseries were established in all the SEMP project sites. Another measure of ex situ conservation was establishment of medicinal plant demonstration plots at the community level, which had the positive externalities of raising community awareness.

In situ conservation in the project sites was very difficult due to the loss of forested areas or habitats of medicinal plants. However, conservation areas in the villages established for biodiversity conservation were found to be potential in situ conservation sites for medicinal plants.

3.5. Promoting Use of Medicinal Plants

The reduced use and practice of medicinal plants has become limited for various reasons, including commercial over-exploitation by drug companies. The community, especially its youths are not aware of the potential of the medicinal plants in healing diseases. This has been an important target of the SEMP project to regain the lost glory of the conventional healing practices based upon medicinal plants.

Activities geared towards this target were distribution of medicinal plants, seedlings and plant parts, along with the maintenance of a register recording information, like which plants and plant parts were being used for what purpose. This information was the basis of experience gathering during implementation of the project.
ESTABLISHMENT OF BASELINES FOR MEDICINAL PLANTS

The preliminary task of plant management in a given area is establishing a baseline for the existing plant resources. This provides with the information for assessing the present trends of distribution and abundance, extent of exploitation, need for conservation and management, and also helps to evaluate the changes achieved through project interventions at the end of the project. In the SEMP project sites, plant resources have been documented at the inception of the project with special focus on medicinal plants. Three different approaches were taken to collect data on plant species with medicinal properties.

4.1. Reconnaissance and Field Observation

At the early stages of the project, the field-based project staff did a reconnaissance of the project sites focusing on social, economic, physical resource and the biological conditions. Information on medicinal plants were also collected from the survey on vegetation along with other health related issues and concerns (e.g. disease, available medical facilities, etc.)

4.2. Secondary Information Collection

An intensive literature review was carried out based on the available information on medicinal plants of the project sites. The quest for information included key informant surveys as well,
along with internet searches for gathering information on community based medicinal plant conservation around the world, particularly in the South Asia. Although search results rendered information on medicinal plants of Bangladesh and conservation initiatives in other parts of the world, very little information was available on the SEMP project sites.

4.3. Participatory Exercise

The knowledge gaps identified through literature review actually called for participatory exercises focusing on medicinal plant resources and associated traditional knowledge. The participatory process for information collection included PRAs involving the local people and FGDs with the local kabiraj or traditional healers. In PRAs the local people actively participated in sharing information on medicinal plants and relevant issues along with the project staff. A number of villagers, designated as volunteers, accompanied the project staff in the collection of data. The data collectors along with the project staff were given an orientation before the activity was carried out.

Teams comprising local people and project staff also collected plant samples with known medicinal plant properties. The local names and use of these plants were ascertained by interviewing the local kabiraj and senior citizens of the area. Scientific names were assigned after consulting the standard field identification guides. Confusions regarding the taxonomic identification of plants were clarified by seeking the expert opinions of Bangladesh National Herbarium. In the Padma-Jamuna Floodplain the baseline information on medicinal plants was collected in 1999 and in the Chanda Beel area in 2000 and the final survey was conducted in 2003.

A considerable pool of information on medicinal plants was revealed and collected through the aforementioned exercises (e.g. IUCN Bangladesh, 2005, on the Padma-Jamuna Floodplain). Information gathered through this process helped the respective communities to incorporate medicinal plants in their Participatory Action Plan Development (PAPD) workshops, to identify their future work plan for medicinal plant conservation. Based on the findings of these exercises, participatory medicinal plant conservation initiatives were implemented at the Padma-Jamuna and Madhumati Floodplain sites.
COMMUNITY MOTIVATION

In any community based environmental or development project, it is vital to ensure the participation of target community at each and every step of the project’s planning and implementation. Medicinal plant conservation is an important part of natural resource management and preservation of indigenous knowledge. To motivate people towards such conservation of herbal medicine sources, appropriate awareness activities are essential. Under the SEMP project in floodplains, a number of awareness campaigns were conducted with special emphasis on the young members of the community. These activities included meetings and workshops at community level, campaigns in schools and other education institutes, production of awareness materials (leaflets, wall-magazines, billboards/signboards, etc.), organizing environmental folk dramas, observance of environmentally significant days and exhibitions.

5.1. Community Meetings and Workshops

More than 200 awareness meetings and workshops were organized at the floodplain project sites of the SEMP on a wide range of environmental topics. Around ten thousand stakeholders and local people of various occupations attended these. In the community meetings and awareness workshops much emphasis was given to medicinal plants and their conservation values. The people were motivated to consult traditional healers before using medicinal plants. The consultations helped people in identifying alternative and effective healing practices from
the same medicinal plant. For the medicinal plants that are entirely used up or destroyed while processing it and the roots of plants that have medicinal value, a careful and need oriented approach was assured.

5.2. Awareness Campaign in Educational Institutions

The aim of these programs was to build awareness among the primary/high school, madrasah and college students about the conservation of natural resources and the benefits of a better environment. Along with attending regular meetings and discussions facilitated by invited facilitators and project staff, the students were involved in environmental/nature clubs, using environment libraries, publishing news-letters, wall-magazines and issue-specific bulletins, consulting herbarium, medicinal plant gardening, camping, study trips and different competitions. The importance of plantation, homestead gardening and nursery often came into the discussions where medicinal plants were highlighted.

In the Madhumati Floodplain, Bangaratna College has a herbarium of local wetland plant species and a good collection of native medicinal plant specimens. The herbarium has been enriched by the students of the college through collection of additional species. The herbarium has been an effective tool in generating awareness among the youth in the community and mobilizing them towards conservation of medicinal plants.

5.3. Nature Clubs

In total, 26 nature clubs were established in the three floodplain project sites. The members, more than 930 in total, were primary and high school and madrasah students and also local youths. These clubs organized various activities such as debates on environmental issues, nature walks, inventorying of local status of different natural resources, along with participation in organized programs for observing a number of environmental events. Medicinal plants were emphasized in many of these programs. On a number of occasions the nature clubs were engaged in establishing and maintaining medicinal plant plots and biodiversity conservation areas (see below).
5.4. Environment-related Day Observance

Various environment-related days were observed with spontaneous participation from the local people. The days observed were the World Wetlands Day (2 February), the World Forestry Day (21 March), the Earth Day (22 April) and the World Environment Day (5 June). Main topics of the discussion meetings were specific to the occasion, although general environmental issues and concerns such as medicinal plant conservation appeared in these talks as well.

The importance of medicinal plants and their conservation was the main issues covered in programs organized for students like essay competitions, quiz competitions and debates. More than 10 debates were organized at the project sites to mark the observance of different environment-related days. Topics included fisheries, plantation and wildlife issues along with medicinal plants. For example, students from Halima Girl’s High School and members of Kanthal Junior School Nature Club at Brahmaputra-Shitalakshya site debated on the topic ‘Medicinal plant can save our life’ in April 2003.

5.5. Awareness Materials

5.5.1. Billboards and signboards

In total, more than 700 billboards and signboards were prepared and displayed in common public places of the SEMP floodplain project sites. These boards were well-produced in multi-colors to attract the common people. The medium of language was Bangla, so that the messages could be easily read and understood by the people, for enhancing their awareness. Along with other environmental issues, importance of herbal medicines and conservation of medicinal plants were the subject matter of those boards.

5.5.2. Wall-magazines

Jalabumi Barta, a quarterly wall-magazine, has been published under the SEMP project in the Madhumati Floodplain. Articles and write-ups are voluntarily provided by the community people. A number of articles on medicinal plants regarding their values, usage, conservation
etc. have been published in different issues of this magazine. Other periodic bulletins and newsletters were also published, that covered the issues and significance of medicinal plants.

5.5.3. Leaflets

In the Madhumati Floodplain, two leaflets on nim (*Azadirachta indica*) and tulshi (*Ocimum sanctum*) were published to create awareness amongst the local community and to sensitize them about the importance of these species, motivating them to nurture such species in their own gardens.

5.6. Folk Dramas

Folk drama is a good medium for raising awareness among people about their surrounding environment. These could create a tremendous impact on the local communities in terms of raising their general levels of awareness about natural resource conservation. Under the SEMP project, the objectives of the dramas were to generate awareness regarding the issues of environmental degradation, resource depletion and consequences along with possible ways of countering them. These dramas, covering a wide range of topics, including the importance of conserving medicinal plants have been very popular with the people, most of whom have come to watch the dramas more than once. A total of 163 folk drama shows were staged in the three floodplain sites, enjoyed by about 230 thousand people.

5.7. Exhibitions

At all floodplain project sites, the SEMP team members participated in the Agriculture Technology Transfer Fair and Tree Fair. At the Madhumati site, the team participated in Wetland Fair on the occasion of the World Wetlands Day in 2003. Barsha Mela or Rain Festivals were organized at the Padma-Jamuna and Bramhaputra-Shitalakshya Floodplain sites under the project. In all of these fairs, importance of plant resources of the floodplains and the need for plantation to reverse the degrading situation were demonstrated, with special emphasis on medicinal plants.
IDENTIFICATION AND RECOGNITION OF TRADITIONAL HEALERS

The traditional healers of a locality have the knowledge of utilizing native plant resources for medicinal purposes. Identification of these healers, thus, is a vital step in taking any participatory medicinal plant conservation initiative. Due to a lack of intensive scientific inventorying, detailed data on medicinal plants of the project sites were absent. So, the herbal healers were a good source of information in the identification of medicinal plants indigent to the areas. In addition, they were also considered as key players in the conservation of medicinal plants, being the extensive users of medicinal plant resources.

6.1. Traditional Healers of the Project Sites

A total of 21 traditional healers have been identified in the three unions of the Padma-Jamuna Floodplain: 14 in Arua, 3 in Gopinathpur and 4 in Kanchanpur. Their average age was calculated at 57 years, with a range of 40 to 75. In total, 13 kabiraj were identified in the Trishal-Kapasia project area. Seven were from Kanthal, four from Durgapur and two from Bailor Unions. Their ages ranged from 34 to 70 years, with an average of 50.

The total number of traditional healers was 135 in 31 villages of the eight unions of the project area in Chanda Beel (1999-2005). The highest number of kabiraj was recorded from Kadambari
Union (50) followed by Kasalia (25). The others were Ujani (21), Nanikhir (17), Satpar (10), Jalirpar (8), Khalia (2) and Rajoir (2).

One of the important observations reveal that with the depletion of medicinal plant resources and their availability, the socio-economic status of traditional healers was also on the decline. Recognizing this fact, the SEMP project attempted to revive their age-old practices and bring them into the limelight once again. Through the identification processes and participation in workshops, they regained their confidence of being traditional healers and this consequently had positive impacts on community initiatives regarding medicinal plant conservation.

6.2. Knowledge-sharing Workshops with Traditional Healers

6.2.1. Padma-Jamuna and Brahmaputra-Shitalakshya Floodplains

At these sites local traditional healers were invited and they participated in workshops where different plant conservation issues were discussed including medicinal plants. During these sessions, the traditional healers and local knowledgeable persons identified the medicinal plant species, which were used locally, their present status and associated conservation issues.

6.2.2. Madhumati Floodplain

Three two-day long knowledge-sharing workshops were conducted at the project sites for local traditional healers. The first workshop was organized on 5 September 2002 at the SEMP Field Office, Baniarchar, attended by 28 male and 4 female healers. In Kadambari High School, Kadambari, 30 male and 5 female traditional healers participated in the second workshop on 7 September 2002. Two days later, the final workshop was organized at the Nayakandi Baptist Church premises in Nayakandi, where 32 male and 4 female traditional healers participated. The theme of all the workshops was “Importance of medicinal plants for human well-being”, and were facilitated by SEMP project staff. The first day of the workshop included discussions on medicinal plants identification, conservation and practices. On the second day, the participants were divided into groups and engaged in group discussions regarding traditional practices, plant parts for use, diseases, possible cure and so on (Figure 1). The second day of this
workshop also included a field visit for species identification, adaptation and conservation of medicinal plants.

![Flow diagram of medicinal plant processing and use. * Used with excipient.](image)

The participants were asked to list 20 to 25 important medicinal plant species and a total of 79 species of medicinal plants came out of the group discussions. Out of these, 16 species were listed by five or more groups out of nine kabiraj groups. Arjun topped the list as it was discussed by all nine groups followed by ashok (8 groups), ulatchandali, patharkuchi and ghritakumari (7 groups). Others species were bashak, bohera, haritaki, kalotulshi, nim, pipul, sada datura, shatamuli, shimpl, telakucha and thankuni (see Table 1 in page 28 for scientific names).

Traditional healers also suggested some vital points on plant conservation, which are listed below:

- Establishment of demonstration medicinal plots in homestead areas with emphasis on locally threatened species
- Publication of medicinal plant species information booklet (inventory of medicinal plants and uses for diseases)
- Awareness raising among the local community
- Establishment of conservation sites
- Conservation of homestead site for medicinal species

The *kabiraj* also provided the rationale for promoting these species:

- These plants are mostly used by the *kabiraj* for curing ailments
- These particular species are locally threatened
- Some of these species are vital sources of herbal medicine but cannot be found locally
- Species are needed for proper practice of traditional treatments
SITE-LEVEL CONSERVATION OF MEDICINAL PLANTS

There are a number of ways through which medicinal plants can be conserved and protected from the factors that threaten their existence in natural habitats. Under the SEMP floodplain component, both ex situ and in situ conservation measures were considered. For ex situ conservation, suitable species selection was followed by establishment of central nurseries at the project sites and also by providing help to establish demonstration plots at village, community and household levels. Establishing biodiversity conservation areas was a part of conserving naturally grown medicinal plants in the project areas. In this chapter these means have been described briefly.

7.1. Ex Situ Conservation Measures

In the Community Based Floodplain Resource Management project under the aegis of the SEMP, ex situ conservation measures primarily involved establishing medicinal plant gardens in the project area. Besides that, demonstration plots of medicinal plants established at the community level were also other means of conservation and used as an awareness tool. Both of these approaches started with species selection, which is the vital component of ex situ conservation, as it reflects the needs and prospects of certain herbal medicines.
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7.1.2. Medicinal plant nursery establishment

At the Padma-Jamuna, Brahmaputra-Shitalakshya and Madhumati Floodplain sites several central medicinal plant nurseries have been established as 'showcase' interventions and also as mother stock of medicinal plants of the area. A large number of demonstration plots were also established at private, community/village and even household levels with the help of the project.

(a) Central medicinal plant nurseries

There are several justifications for raising a central demonstration nursery in the project area. Firstly, it raises awareness of herbal medicinal practices in the locality. Secondly, it increases the local availability of medicinal plants, especially as the primary source of supply of plants and plant parts for local traditional healers, facilitating the practice of herbal treatment in the local community. Thirdly, the establishment of such nurseries encourages people's participation through small-scale medicinal plots at private and community levels. Finally, from a conservation point of view, rare and locally threatened medicinal plants are also safeguarded. At the three project sites, five central nurseries have been established and maintained under the direct supervision of the project. These gardens are visited by students and local community, who also collect plant parts and seedlings for treating diseases.

Padma-Jamuna Floodplain

At this project site, two central medicinal plant nurseries were established in Arua Union. The first nursery was established in early 2000 in Maluchi High School with an area of 10 decimals. The second nursery, with a larger area of 58 decimals, was established in 2001 in the SEMP project office premises in Bawlikanda village. In the first nursery, 87 species were reared and 1,466 saplings were raised by the middle of 2004. In the Bawlikanda nursery, 164 species were nurtured and 85,900 saplings were produced until December 2004. At present, the stock of medicinal plants amounts up to 13,200 saplings.
About 2,000 saplings have been produced here since its inception. In May 2005, around 800 saplings were stocked. Some of the significant ones are: aada (Zingiber officinale), akanda, amlaki, apang (Achyranthes aspera), arjun, ashok, bohera, basak, bel, bhang, bisallakaroni, chandan (Santalum album), chhatian/chatim (Alstonia scholaris), dadmaradan, several types of gandaphul (Tagetes spp.), ghandabhaduli, ghritakumari, harjora, haritaki, hatishur, holud (Curcuma longa), ishwarmul, kalomegh, katanotey (Amaranthus spinosus), kumarilata, lajbatii, mendi/mehdi, nayantara, nim, nishinda, patharkuchi, punarnava, raktachita, shatamuli, shada and kalo dhutura (Datura spp.), shada lajabati, shet and nil aparajita (Clitoria ternatea), shimul (Bombax ceiba), telakucha (Coccinea cordifolia), thankuni, several types of tulshi (Ocimum spp.) and ulatkambal (for scientific names, see Table 1 and previous sections).

(b) Demonstration plots

A good number of medicinal plant demonstration plots were established under the project. Interested people were provided with saplings, seeds, pots, fence and instruments under the project to establish these plots.

Padma-Jamuna Floodplain

Seven demonstration plots at private level (three in Arua and four in Gopinathpur Unions) and two plots at community level (Gopinathpur and Kanchanpur Unions - one in each union) were established in 2001 and 2002. The size of these nine plots ranged from 2 to 8 decimals (average 3.7 decimals) with the average number of species at 38 (ranged from 23 to 71). On an average, 566 saplings have been raised so far in each plots, ranging between 332 and 946.

Brahmaputra-Shitalakshya Floodplain

Besides two central plots in Bailor and Durgapur, eight demonstration plots were established at the project site. Six were at private level (two in 2001 and rest in 2003) and two were at community level (medicinal plots in Bailor Rahmania High School in 2003 and Kanthal Junior High School in 2002), with an average size of 5.9 decimals (with a range of 4 to 10 decimals) and average number of 24 species per plot (ranging between 15 to 35). On an average, 460
saplings were raised per plot ranging from 170 to 893. In 2004, the stock was 386 on average, and ranged from 170 to 732. Of these, Kanthal Junior High School Medicinal Plant Plot sold 452 saplings and two private sold 141. Supports provided by the project included saplings, compost preparation, IPM, along with instruments and other logistical support.

**Madhumati Floodplain**

At this floodplain site, 51 medicinal plant plots have been established mostly at private level, but there are also some at community level. These include two plots at the premises of the offices of District Commissioner and Assistant District Commissioner in Gopalganj District and one at the office premises of TNO, Gopalganj Sadar. Two plots were in church premises (Baptist Church in Jalirpar and Nayakandi Church) and two were in two local *asram* managed by respective *asram* committees in Nanikhir and Goalgram villages. Another two nurseries were established in local hospital compounds (Madapur Civil Surgeon Hospital and Rajoir Hospital). In addition, under institutional nursery programme, medicinal demonstration plots were raised in a school and a college as well. Golap Environmental Club established a medicinal plant plot in the Nanikhir High School premises in 2002. The Nazrul College premises in Satpar is the other example.

In 2002, a maximum 38 medicinal plant plots were established in the project area. Among other years, three were established in 2000, four in 2001 and six were in 2003. The range of plot size was between 1 and 4 decimals with an average of 1.73 decimals. The largest of these is the Ganesh Pagal Asram Medicinal plot in Dighirpar, Kadambari. In the late 2004, the number of species per plot ranged between 25 and 127 with an average of 61.

**c) Medicinal plant plots at household level**

**Padma-Jamuna Floodplain**

In total, 63 demonstration medicinal plant plots were facilitated under the SEMP floodplain project at the household level or village level till June 2004: 22 in Arua, 28 in Gopinathpur and 13 in Kanchanpur Unions. The average number of species nurtured per plot was 20 ranging
between 8 and 108 species. On average, 226 saplings were raised per plot and ranged from 58 to 1,279. Till 2004, these plots produced more than 14,250 saplings. Major species planted in these plots were amloki, apang, arjun, basak, bel, bohera, bishallakarani, dhatura, harjura, haritaki, jafran, jointi (Sesbania sesban), lajabati, nim, kalomegh, kumarilata, patharkuchi, tulshi, tokma and ulatkambal. The project provided support to these demonstration plots in terms of saplings, seeds, pots and materials to build fence.

**Brahmaputra-Shitalakshya Floodplain**

A total of 102 medicinal plots were established at household level at the Trishal project site. The average number of species in a plot was 15 ranging between 6 and 27, and on an average 134 saplings ranging from 28 to 278 were nurtured in each plot. Twenty-five plots were established in Bailor, 38 in Durgapur and the rest were in Kanthal Unions. Major species planted in these plots were akanda, amloki, apang, arjun, basak, bohera, bel, chhatim, dadmardan, dhatura, ghritakumari, haritaki, harjora, lajjabati, kalomegh, nishinda, nim, sharpagandha, shimul, tentul, tokma, tulshi, ulatkambal and zaba (Hibiscus sp.) (for scientific names, see Table 1 and the previous sections).

### 7.1.2. Roadside plantation

Bawlakanda Road (SEMP project office to Maluchi School) in Arua Union was planted with 20 saplings of medicinal plants along a distance of 1 km. In Kanchnapur Union, 1 km of Kusiarchar Road (Maluchi to Kukandi) was planted with 15 saplings. Twelve medicinal plant saplings were planted on 1 km of Vatipara Road (Maddapara to Maniknagar) in Gopinathpur Union. In all three sites the species included akanda, amloki, arjun, bashak, bohera, haritaki and nim.

### 7.2. In Situ Conservation Measures

As mentioned earlier, a large number of medicinal plants grow in the wild in the project sites. As a part of biodiversity conservation, a separate initiative under the SEMP project, certain ejmali and khas areas have been designated as conservation sites. Being undisturbed, these sites now have good assemblage of medicinal plants. No medicinal plant has been introduced to any of these sites. The naturally growing medicinal plants are available for limited exploitation or could act as a source of mass propagation in the nurseries or demonstrations plots. Through community awareness campaigns and medicinal plant promotion campaigns, the community was sensitized about protection of plants with medicinal value, growing in the wild. Many of the medicinal plants before were regarded as weeds or economically insignificant species by the community in general. Through the awareness campaigns, the community was mobilized to protect all these plants in the wild since many of them had unexplored potentials as medicinal plants.
7.2.1. Padma-Jamuna and Brahmaputra-Shitalakshya Floodplains

Four biodiversity conservation areas have been established in the Padma-Jamuna project site in Manikganj District: two in Arua (Nali and Bawlikanda Biodiversity Conservation Areas), one in Gopinathpur (Bahadurpur Biodiversity and Bird Conservation Area) and one in Kanchanpur (Kutirhat Biodiversity Conservation Area) Unions. These areas cover a total area of 12 acres. At the Trishal-Kapasia site, on the other hand, four conservation sites have also been established. Of these, two are in Kanthal (Baliarpur Sluice-gate and Uttar Singrail Biodiversity Conservation Areas) and two in Durgapur (Mashok and Bortek Biodiversity Conservation Areas) Unions. These areas cover a total area of 29 acres. Respective village environment committees are managing three of these sites (only Ichhamati Nature Club manages Uttar Singrail Biodiversity Conservation Area) with initial assistance from the project. These sites are well-marked with signboards and people are aware of their existence and purposes through community meetings and discussions.

7.2.2. Madhumati Floodplain

The biodiversity conservation areas in Meshobhita, Luxmipur, Kadambari Ganesh Pagal Asram and Ujani of the Madhumati Floodplain project area, implicitly facilitated in situ conservation of medicinal plants naturally growing there. Besides, the plantation areas in educational institutional sites; religious places like church, temples, mosques; haat and bazaar, and under social forestry, homestead plantation, rivers and canals plantation also harbour medicinal plants. Some medicinal plants growing naturally in these locations are, akanda, apang, bashak, bathuasak (Chenopodium album), bhuiamla (Phyllanthus freternus), bishkatali (Persicaria orientalis), brahmishak (Bacopa monniera), dadmardan, durba (Cynodon dactylon), ghagra (Xanthium indicum), goalilata (Butea parviflora), hatishur, kalkasunda (Cassia sophora), kukursunga (Blumea lacera), lajjabati, mukthajhuri (Acalypha hispida), nishinda, patharkuchi, raktadron (Leonurus sibiricus), shetodron, shialmutra (Vernonia patula), shushnishak (Marsilea quadrifoliata), swarnatala (Cuscuta reflexa), telakucha, thankuni and tokma (see Table 1 and the previous sections for scientific names).
7.3. Dissemination of Medicinal Plants and Plant-parts

From the central medicinal plant nurseries/gardens of the project, medicinal plants and plant parts have been distributed among herbal medicine users and the common people. During distribution, registers have been maintained, recording information on which plants and plant parts were being used for treating which particular diseases. Some analyses of these data have been presented in the following chapter.
EXPERIENCE FROM THE INITIATIVE

The overall response to the promotion of medicinal plants at the SEMP floodplain project sites has been promising. Both common people and the herbal medicine practitioners showed enthusiasm in the inventorying of medicinal plants of the project sites, identification of their abundance, threats to their status, proposing possible conservation interventions and promoting medicinal plant use in a sustainable manner. A register was maintained for each of the central nurseries where names of the beneficiaries, their addresses (village, union), plants or plant parts requested for, the purpose and the advisor (self, family member, kabiraj, etc.), provided a wealth of information. In the following sections some specific patterns regarding the use of medicinal plants are described as observed from the medicinal plant promotion initiative under the SEMP.

8.1. Reasons for Using Medicinal Plants

In the Padma-Jamuna Floodplain, three major reasons were identified as the main drivers for the use of medicinal plants. The majority of the users (57%) informed that they used herbal treatment because it worked better than modern medicines. About 30% of the medicinal plant collectors of Maluchi Nursery were practising herbal medicine because of lack of money, while the rest used it because of the absence of modern treatment facilities available nearby. In the Madhumati Floodplain, there were only two main reasons for the use of medicinal plants. About 60% of the users informed that they used medicinal plant products because it is
relatively inexpensive and also because they do not have enough money to afford modern medical facilities. For the remaining 40%, the rationale was different: they strongly believed that traditional healing practices worked better than modern counterpart. Some of them even argued that all the modern medicines were pirated from the traditional healing practices from all over the world.

8.2. Users of Medicinal Plants

In the Padma-Jamuna Floodplain, a total of 462 people have been benefited from the Maluchi central nurseries (Figure 2). Visitors were collecting medicinal plants or its parts from the demonstration medicinal plant nurseries without any cost. Sometimes they also collected from the nearest village-level or homestead-level plots without any cost.

In the Brahmaputra-Shitalakshya Floodplain, between March 2002 and June 2005, a total of 322 people visited the central nursery in Bailor Union, Trishal, to collect medicinal plant parts to prepare traditional medicines (Figure 2).

![Figure 2. Monthly average of visitors collecting plant parts from the central nurseries in Maluchi (Padma-Jamuna Floodplain, 2001-05), Bailor (Brahmaputra-Shitalakshya Floodplain, 2002-05) and Satpar (Madhumati Floodplain, 2000-03).](image)

On the other hand, in the Madhumati Floodplain, a total of 4,330 people visited the central medicinal plant nursery of the SEMP in WRTC premises at Bhennabari, Satpar (March 2000 to May 2005). Most of the visitors (78%) came to the nursery only for a visit, whereas about 12.3% of the visitors were provided with seedlings/saplings of medicinal plants during the visit (Table 2). Another 9.7% were provided with different plant parts to use as medicine. Figure 2 shows the monthly pattern of visitors who had collected plant parts from March 2000 to 2003.
<table>
<thead>
<tr>
<th>Year</th>
<th>Saplings provided</th>
<th>Parts of the plants provided</th>
<th>Visit only</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>50</td>
<td>39</td>
<td>350</td>
<td>439</td>
</tr>
<tr>
<td>2001</td>
<td>65</td>
<td>106</td>
<td>550</td>
<td>721</td>
</tr>
<tr>
<td>2002</td>
<td>90</td>
<td>134</td>
<td>650</td>
<td>874</td>
</tr>
<tr>
<td>2003</td>
<td>140</td>
<td>64</td>
<td>700</td>
<td>904</td>
</tr>
<tr>
<td>2004</td>
<td>150</td>
<td>56</td>
<td>725</td>
<td>931</td>
</tr>
<tr>
<td>2005 (till May)</td>
<td>40</td>
<td>21</td>
<td>400</td>
<td>461</td>
</tr>
<tr>
<td>Total</td>
<td>535</td>
<td>420</td>
<td>3375</td>
<td>4330</td>
</tr>
</tbody>
</table>

**8.3. Seeking Advice on Medicinal Plants**

A trend analysis of the registers in central nurseries of the different project sites showed that it was the herbal healers who motivated and influenced people towards medicinal plants. For example, from the record of the WRTC nursery in Chanda Beel it was found that about 43% of the medicinal plant users used herbal medicines only as instructed by the traditional healers. Twenty percent people prescribed medicinal plants for their own use. The remaining 37% received advice on medicinal plants and dosage from the knowledgeable persons of the family or community.

**8.4. Medicinal Plants, Plant-parts and Treated Diseases**

**8.4.1. Diseases treated**

According to the registers in the central nursery in Maluchi (Padma-Jamuna Floodplain), more than one fifth of the recorded diseases were related to cold and cough followed by gastrointestinal or abdominal diseases/disorders like dysentery, stomach-ache, indigestion, constipation and worms (Figure 3a). Skin diseases and different types of pains and aches in the body made up the other two major portions. Similarly, in the Brahmaputra-Shitalakshya Floodplain, cough and cold comprised one third of the diseases treated by the medicinal plants collected from the central nursery (Figure 3b). It was followed by different gastrointestinal (one fourth of all the diseases). Skin diseases, weakness and heart disease are few of the other important diseases, as identified from the nursery register. The same was true in the Madhumati Floodplain as well.

**8.4.2. Plant species asked for**

In the Padma-Jamuna Floodplain, *kalpanath*/ *kalomegh* (14%) was followed by *bashak* (11%), *tulshi* and *bhat* (7% each) and *punarnava* (6%). The majority (56%) was made up of more than 50 species (see Chapter 7 for scientific names).
In the Brahmaputra-Shitalakshya Floodplain, *bashak* and *tulshi* equally comprised 30% of the total plant collected from the Bailor nursery (Figure 4). Another five species made up 28% while the rest 42% plant supply was met by more than 30 of other species.

In the Chanda *Beel* area, most of the medicinal plants used were *bashak* and *tulshi*. But the single most important plant species used for the treatment of a whole range of diseases was found to be *kalomegh*. This species is used for treating as many as 11 diseases. Other major species include *nishinda*, *ulatkambal*, *lajjabati* and *kalo dhatura* for treating 8 diseases each and *thankuni* for 5 diseases (see Chapter 7 for scientific names). However, this information is entirely based on only the registers of project nurseries; medicinal plant species collected from the wild were not included in this analysis.

**Figure 3. Proportions of different diseases treated with medicinal plants collected from the SEMP nurseries at the a) Manikganj and b) Trishal sites.**

8.4.3. **Plant parts collected**

Leaf was the most commonly used plant part in all the three nurseries (Table 3). It was followed by the stem, root and bark. Other plant parts utilized were small in comparison with the above.
Table 3. Percentage distribution of different plant parts supplied from the central medicinal plant nurseries in Maluchi (Padma-Jamuna Floodplain, 2001-05), Bailor (Brahmaputra-Shitalakshya Floodplain, 2002-05) and Satpar (Madhumati Floodplain, 2000-03).

<table>
<thead>
<tr>
<th>Plant part</th>
<th>Maluchi</th>
<th>Bailor</th>
<th>Satpar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaf</td>
<td>67</td>
<td>78</td>
<td>67</td>
</tr>
<tr>
<td>Stem</td>
<td>17</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Bark</td>
<td>1</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Root</td>
<td>9</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>Flower</td>
<td>2</td>
<td>&lt;1</td>
<td>2</td>
</tr>
<tr>
<td>Fruit</td>
<td>3</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Seed</td>
<td>&lt;1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Whole plant</td>
<td>2</td>
<td>&lt;1</td>
<td>3</td>
</tr>
</tbody>
</table>

8.5. Excipients

Excipient is the external component used along with main medicinal plant part or extracts to make the traditional medicines more effective. Sometimes they work as suspension media, provide sweetened coatings, or have catalytic effects. Honey is the most widely used excipient in herbal medicines, along with milk.
SUSTAINABILITY OF MEDICINAL PLANT CONSERVATION

The importance and potentials of medicinal and aromatic plants have recently been reemphasised by the scientific communities, pharmaceutical industries as well as the consumer society, which is stronger in the western world. At the same time, more and more focus is also being given on the conservation of medicinal plant species, their use and the knowledge associated with them. Documentation of indigenous knowledge on medicinal plants and their protection in nature through cultivation have been targeted in many initiatives. In Bangladesh, medicinal plants have also become an urgent issue, filtering down from the policy level, as is understood from the drafting of ‘Medicinal Plants Protection Act’ in 2005.

Although very localized, the initiatives taken for medicinal plant conservation under the SEMP floodplain project have significantly impacted the people of the project areas. Community people are now much more aware of the importance of medicinal plants, the need for their conservation, and protection measures to be taken for safeguarding these natural capitals. Establishment of medicinal plant plots in the household premises of the project areas is a promising sign, which not only ensures local supply of raw materials for herbal medicines but also provides an alternative source of income. Traditional healers have also been immensely benefited in terms of increased availability of medicinal plants from plots at household,
community and private levels, which in turn has boosted their levels of confidence and ensured the survival of their age old practices. Such initiatives would be worth replicating in other areas of Bangladesh with similar potential.

In light of the current project, following recommendations are proposed for sustaining a community-based initiative for medicinal plant conservation.

1. Exchange visits of traditional healers for sharing information is a good strategy towards ensuring sustainability. These activities are expected to expand the understanding and use of medicinal plants within the sites in question, along with the recognition of the variations that exist in terms of traditional healing. Through such exchange of knowledge, medicinal plant species with good potential and abundance can be identified.

2. A community register of the uses of medicinal plants should be in place, along with the proper documentation for ensuring property rights and claiming patent rights. Special care should be taken to prohibit bio-piracy, which can be best achieved by maintaining a ‘people’s register’.

3. Developing a market linkage is essential step for reviving the practices of herbal medicine and can be achieved in the following ways:

   a. Commercial scale production

   The current scale of production at floodplain sites is not adequate for commercial purposes. Against this backdrop, a detailed assessment of the potential land availability has to be done for expanding medicinal plant production.
b. **Value adding**

Medicinal plants in their raw form are not worth much. For commercial utilization of medicinal plants in Unani or Auyurvedic medicines, the raw medicinal plant products should be processed to some extent, for value addition and development of small-scale entrepreneurship lead by the women.

c. **Marketing**

For effective marketing of medicinal plants, their extractives, derivatives and products, international linkages have to be developed with the medicine and cosmetics producers in the country. The NGOs involved in medicinal plant conservation and promotion, should take the lead in developing such linkages. With the generation of revenue from the sale of medicinal plants, people will be motivated towards conservation and sustainable use of these resources.
REFERENCES

