

# Gender and biodiversity management: India

## ABSTRACT

Women play a central role in the conservation, management and use of biodiversity, the Earth's rich animal and plant resources, on which life depends. Their contribution, however, is often overlooked. They are "invisible" partners from grassroots to policy level. If biodiversity is to survive, women and men must play an equal part in its management. There is therefore an urgent need to consider gender – who does or uses what and how and why – in development efforts, to promote true partnership and ensure the sustainable conservation and use of biodiversity now and in the future.

In 1997, the Indian non-governmental organization (NGO), the M.S. Swaminathan Research Foundation (MSSRF), with support from the Food and Agriculture Organization of the United Nations (FAO), conducted a research project on Gender Dimensions in Biodiversity Management in different locations throughout India, focusing primarily on gender roles in agro-biodiversity. This analysis of the roles played by women and men in managing bioresources is a comparatively unexplored but crucial subject, which allows us to re-examine current practices and understand their gender implications. Equipped with this gender-sensitive knowledge, it should be easier to avoid past mistakes and meet the needs, opportunities and constraints of women and men in the future.

India's immense bio-geographic, socio-economic and cultural diversity cannot be comprehensively described in a small selection of case studies. Yet, each of the seven case studies covered in this report – Wayanad, Kolli Hills, Jeypore Tract, Bhitarkanika, the Lakshadweep Islands, Arunachal Pradesh and Mizoram – represents a distinct ecosystem or region of significant biological diversity that is currently under threat. The studies highlight dynamic communities in different stages of transition and development, where livelihood security may conflict with the requirements of biodiversity management.

Overall, the MSSRF project found that in the field of biodiversity management, gender roles are socially constructed rather than biologically determined. Considerable variations were found in the work done by men and women in different locations, with the same tasks, such as seed selection or winnowing,

being done by women in some communities but not in others. In areas of traditional agriculture, among communities and classes that did not practise gender seclusion, women's participation in biomass-related activities was high and their knowledge and interest in conservation was apparent. Women's involvement with conservation practices such as preservation of high-quality seed was high in communities where they were the main food producers. Examples are the Apatanis of Arunachal Pradesh and the Garhwalis of the Western Himalayas. The same is true of areas where women shared joint responsibility, such as among the Mizos, Nagas and some hill tribes of the Western Ghats. The project found that this traditional knowledge base was being eroded by changes related to age and gender as, for example, in parts of Orissa. In agriculturally developed areas where market forces had penetrated deeply, such as Tamil Nadu, women were less involved in conservation practices but continued to play a role in seed preservation.

The research clearly showed that there is a simple division of labour, skills and knowledge along gender lines and that age and education are increasingly important factors in determining gender roles and knowledge of natural and ecological resources.

While there are encouraging indications, it is too early for precise assessment of the impact of these innovative studies. The exercise represents an initial attempt to understand the links between gender and biodiversity, highlighting a number of gender considerations in conservation and resource use. It has undoubted potential to influence the programming of biodiversity management by local community groups and to motivate national and regional initiatives. India is in danger of losing its rich biodiversity unless immediate and urgent steps are taken in the Western Ghats, the northeast region, the Jeypore tract of Orissa and coastal ecosystems. The voice of nascent women's groups in these biodiversity-rich areas needs to be recognized and strengthened and their organizational units need to be extended, so that action to manage biodiversity achieves short- and long-term success.

The MSSRF findings could offer potential for more flexible approaches in the future. On the basis of a brainstorming workshop held at Chennai on 9-10 June 1997, for example, recommendations were drawn up for an Agenda for Action at national and international level. Action research programmes were recommended to integrate the gender dimension in the following three areas:

- conservation: *in situ*, *in situ* on-farm and *ex situ*;
- sustainable utilization;
- ethics and equity in sharing benefits.

The meeting called for national legislation to integrate the gender dimension

and considered the importance of a future National Community Biodiversity Movement, which would pool the capacities of existing networks of groups and associations. An urgent need was recognized for an All-India Coordinated Project on Gender and Biodiversity, with support from relevant organizations and government ministries.

## INTRODUCTION

By and large, the gender dimension in biodiversity management has been neglected in India. In almost all government-sponsored *in situ* and *ex situ* conservation efforts, gender considerations have yet to be integrated into the culture of management. Only in recent years has gender come to be acknowledged as an important variable in conservation and management.

In community conservation efforts, there are clearly defined gender roles, particularly in the areas of plant and seed selection and preservation. In a temple at Along in Arunachal Pradesh, for example, credit is given to a woman for domesticating rice. Women's role in biodiversity conservation has been overlooked, despite the fact that women have a profound knowledge of plants and animals in their environment. Although the natural resources of the environment provide the basis for both women's and men's livelihoods, women have traditionally used a variety of indigenous plants, trees and animals and so have a direct stake in their preservation. Loss of habitats and biodiversity ultimately affects the underprivileged, the majority of whom are women. This is why women have participated in large numbers in movements like the Chipko Andolan.

Although they possess knowledge about biodiversity conservation, poor women are often left with no choice but to exploit natural resources in order to survive. There is therefore urgent need for studies on the gender dimension in biodiversity conservation and management.

Women, particularly in hill areas, have greater responsibility for agriculture than ever before, resulting from a process termed the feminization of agriculture, in which women are increasingly responsible for agriculture. The contributions of women and men to agricultural production are often divided along gender lines, with important implications for sustainable agricultural practices and biodiversity conservation. Men are generally responsible for land preparation, such as clearing and soil tilling, while women are responsible for sowing, hoeing, crop maintenance, harvesting, food processing, storage and seed selection for future planting. Studies show that because of women's responsibilities for secur-

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<sup>62</sup> A movement in which people demonstrate their support for conservation by embracing trees in an attempt to prevent deforestation.

ing food, fuel and water, they tend to have a greater interest in preserving and conserving croplands, forests and other natural resources. Women are traditional caretakers of genetic and species diversity in agriculture; men are more often concerned with converting these resources into cash.

At a meeting to consider methods of incorporating gender-sensitive approaches into plant genetic resource conservation and use, convened by the International Plant Genetic Resources Institute (IPGRI) and FAO in Rome in October 1996, the following working definition of gender was adopted: "Gender refers not to women alone but to the different socially constructed roles of, and relationships between, men and women across time and space as well as among variables of age, wealth, caste, ethnicity, etc." The participants also concluded: "Within local communities, women maintain vital knowledge and play crucial roles in the conservation and use of biodiversity." An understanding of the different roles and responsibilities of men and women farmers in plant genetic resource conservation and management and the intrinsic value of their knowledge are crucial to initiatives on sustainable, effective and equitable plant genetic resource conservation and use. Agricultural research and extension based on local and gender-differentiated knowledge systems, institutions and management strategies should be provided to assist farming communities to maintain plant genetic resources in their agro-ecological systems.

Although the conventions on biodiversity and climate change and Agenda 21, approved at the June 1992 Earth Summit refer to the need for taking into consideration the gender dimension in environmental protection, the issue has not received sufficient attention at operational level.

The Global Convention on Biological Diversity (CBD), ratified by 172 countries, recognizes the "vital role that women play in the conservation and sustainable use of biological diversity" and affirms the "need for the full participation of women at all levels of policy-making and implementation for biological diversity conservation".

But what is the meaning of affirmation in operational terms? **MSSRF**, whose mandate is to give a pro-nature, pro-poor and pro-women orientation to technology development and dissemination, has been working on the gender dimension

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<sup>63</sup> See, for example, the FAO publication *Gender – the key to sustainability and food security*, which states: "Rural women in developing countries hold the key to many of the planet's agricultural systems for food production, seed selection and protection of agro-biodiversity. Home gardens are often used as experimental plots by women using diverse wild and indigenous species. Research in home gardens in one single village in Thailand revealed 230 different plant species, many of which had been rescued from a neighbouring forest before it was cleared".

<sup>64</sup> The United Nations Conference on Environment and Development, Rio de Janeiro, Brazil.

in biodiversity conservation and management in India. The results were discussed at an FAO workshop on 9-10 June 1997, which forms the basis of this report.

### PRE-INNOVATION

The situation before implementation of the project can be described as having three levels, the third of which was addressed in particular by the project:

- institutional arrangements for biodiversity management;
- the role of the community in biodiversity management;
- information gaps on gender roles and biodiversity management.

### Institutional arrangements for biodiversity management

India has one of the largest networks of protected areas in the world. Besides its national parks and sanctuaries, eight biodiversity-rich areas have been designated as biosphere reserves to conserve representative ecosystems. Five of the protected areas have been designated world heritage sites under the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List. Six wetlands have been designated under the Convention on Wetlands of International Importance, Especially as Waterfowl Habitat (Ramsar Convention) and a further 11 wetlands have been identified for intensive conservation and management.

Before the arrival of colonial rule, forests were managed by tribal and local communities. Wood and non-wood forest products were generally used in a sustainable manner, since people's lifestyles were simple and their needs were few. From the middle of the nineteenth century, however, the management of forests became the responsibility of government forest departments.

Today, India has a well-developed institutional infrastructure for *ex situ* preservation of plants, forest trees, farm animals and fish. The Indian Council of Agricultural Research (ICAR) has established national bureaux of plant, animal and fish genetic resources. The National Bureau of Plant Genetic Resources (NBPGR) has created, with assistance from the United States government, one of the world's largest repositories for the conservation of seeds of economic plants. NBPGR is a national organization with a broad mandate to provide vital support in the form of required germplasm to the country's crop improvement programmes and to act as custodian of India's genetic resources of cultivated plants and their wild relatives. Besides its network of 12 regional stations and base centres in different agro-ecological regions of the country, it has strong links with:

- crop-based ICAR institutes;
- national research centres;

- All-India Coordinated Crop Improvement projects;
- state agricultural universities;
- relevant government departments;
- NGOs;
- research foundations;
- private-sector research and development programmes.

The Ministry of Environment and Forests conserves forest genetic resources and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) maintains a large *ex situ* collection of crop germplasm of chickpea, pigeon pea, sorghum, millet and groundnut. ICRISAT contributes to sustainable improvement in agricultural productivity in the semi-arid tropics through international research and related activities. It does this in partnership with national research systems and countries where its mandate crops are relevant to improving nutrition and wellbeing, especially among poor people.

The MSSRF selected specific locations in Tamil Nadu, Andhra Pradesh, Orissa and Kerala for intensive study under its Community Biodiversity Programme. Through this programme, scientists collected indigenous germplasm available within the study areas. In addition, interested NGOs also began sending valuable seed collections from their localities. During 1997-98, the number of entries in the Community Gene Bank increased to 679 and included cereal, millet, pulse and endangered and medicinal plant species. The entry register, herbarium, photographs and other essential information are regularly updated.

#### **The role of the community in biodiversity management**

There are over 53 million tribal people in India belonging to 550 communities. Two-thirds of the tribal population live in central India, in the states of Madhya Pradesh, Orissa, Bihar, Gujarat and Rajasthan. Nearly 80 percent of the population of the northeastern states of Meghalaya, Nagaland, Mizoram and Arunachal Pradesh belong to tribal communities. In the northeastern tribal area, there are genetic resources of coir, jute, saccharum, cucurbits, rice, soybean, maize, citrus, buckwheat and several beans. The central Indian tribal belt has contributed rich genetic diversity in minor millet, pigeon pea, rice, niger, sesame and forage grasses. In the Western Himalayan tribal belt, there is considerable genetic variability in buck wheat, amaranth, soybean, lentil, cowpea and pome and stone fruits.

In the mountains of the southern Western Ghats, of which Wayanad, Kerala, forms an important biodiversity area, tribal people survive largely on subsistence agriculture. Concepts of purity and pollution govern women's roles and restrict entry to sacred groves. Women play a critical role in conserving traditional

varieties of food crops and medicinal plants.

The varied landscapes of the Kolli Hills of Tamil Nadu are an area of considerable agro-biodiversity. Women here play a major role in seed selection and seed storage. Traditional systems of resource use and cultivation are now being replaced by cash crops in order to meet the people's needs.

The forested hills of the Jeypore tract of Orissa are known for diversification of rice and home to different tribal communities. Both women and men are involved in conservation but their knowledge is being eroded. Polygamy is widespread and some roles are demarcated by gender, although many activities are jointly undertaken in families.

The Bhitarkanika sanctuary on the Orissa coast is a protected delta area with considerable mangrove diversity. Caste and social divisions are of considerable significance in determining gender roles and relations.

Sparsely populated Amnachel Pradesh has great ecological and socio-cultural diversity. The stratification, vulnerability and low status of tribal women could have a far-reaching impact on the prospects for biodiversity conservation. Sustainable use of natural resources needs further investigation.

In Mizoram, on the other hand, different topographical conditions and the practice of slash-and-burn agriculture have eroded biodiversity. New methods of organic cultivation, the outcome of a blend of traditional and modern practices, are being practised. The coral reefs and lagoons of the Lakshadweep Islands, together with the surrounding sea, provide a rich habitat for a unique matrilineal Muslim community. However, the status enjoyed by women because of the matrilineal system is circumscribed by the practice of women's seclusion, purdah and restricted physical mobility. Gender roles and the knowledge base of men and women are thus sharply defined.

#### **Information gaps on gender roles and biodiversity management**

There is a widespread awareness of women's roles and gender-differentiated responsibility in managing biodiversity but there has been no systematic study to document situation-specific gender roles in biodiversity management, nor is there a database on the women professionals who contribute to biodiversity management.

### **INTRODUCING INNOVATION**

#### **India's biodiversity**

India is one of the world's 12 megadiversity areas, with over 45 000 wild plant species and 77 000 wild animal species registered, accounting for about 6.5 per-

cent of the world's known wildlife. The sheer diversity and uniqueness are impressive. The biological wealth of India is a valuable asset to be managed prudently, particularly since the CBD recognizes that the biodiversity present within the political frontiers of a country is the sovereign property of that country. The diversity of living forms in India is the result of climate and soil variability and cultural and ethnic diversity. There are over 53 million tribal people in India, belonging to 550 communities.

There are three megacentres of endemic biodiversity in India – the Western Ghats, the Eastern Himalayas and the Western Himalayas – and 25 micro-endemic centres. The total endemic taxa of flowering plants in the country number about 148 genera and 5 725 species, of which 3 471 taxa are in the Himalayas, 2 015 in peninsular India and 239 in the Andaman and Nicobar Islands.

### **Current scenario**

According to MSSRF, available literature on gender and biodiversity provides the following indications:

- Men and women have different kinds of knowledge and information about plants and animals, in part because they have different tasks in farming and providing income and goods for their households.
- In many societies, women are mainly responsible for seed selection and storage, exchanging seed and ensuring that local agro-biodiversity is preserved.
- Both men and women preserve their native plant and animal species. The motivating factors, however, may differ. Men tend to be more interested in the market value of the species, while women may be more interested in their cooking and nutritional value. In areas where there is out-migration of men leading to the feminization of agriculture, women tend to conserve a wide range of food and medicinal plants for ensuring household food and health security.
- The ways in which men and women have traditionally managed their seeds, plants and animals are fast changing. Government agricultural policies often lead to changes in dietary habits, resulting in tribal and rural families abandoning their traditional foods. This is particularly true in India, where the extensive public distribution system of the central and state governments generally concentrates on the supply of rice and wheat. Dietary changes also occur when tribal families lose access to non-wood forest products in habitats declared as protected areas.
- While women probably constitute the largest group of farmers who have conserved and improved agro-biodiversity, they often have no property

rights to land. They also tend to be bypassed by development schemes related to biodiversity. Women's universities, home science colleges and other educational institutions catering to women's needs seldom include biodiversity as a field of study.

- The fast-growing literature on intellectual property rights, *sui generis* systems of plant variety protection and farmers' rights also reveals a lack of gender sensitivity in relation to the issues under discussion. There is practically no literature dealing with gender and intellectual property rights.
- A few studies that directly deal with gender and plant breeding, such as a number on wild food collection and land race selection, have a narrow focus with no broader interest in management systems. These studies often contain no comparison with the situation for men.
- Literature dealing with wild or domesticated plant genetic resources, when disaggregated by gender roles or the men-women division of labour, presents overwhelming evidence of a clear gender dimension to labour, knowledge and management. The same is true of agro-biodiversity in home gardens, forests and cultivated and fallow land. It is therefore surprising that the insights gained from over two decades of analysis of farm households and gender relations are not being applied critically to research on biodiversity. Most literature dealing directly with gender and biodiversity is based on platitudes and extrapolations rather than on empirical research or on empirical research that is superficial or narrow in scope. Broad generalizations are frequently made from scant evidence.

India's immense bio-geographic, socio-economic and cultural diversity cannot be described in any small selection of case studies. Each of the case studies referred to here covers a distinct ecosystem or region of significant biological diversity currently under threat.

The five case studies carried out in Wayanad, Kolli Hills, Jeypore Tract, Bhitarkanika and the Lakshadweep Islands related to women and biodiversity conservation and sustainable use. They were reviewed for this study from the perspective of the gender dimension in biodiversity management.

The two case studies from Arunachal Pradesh and Mizoram in the north-eastern region were exploratory, included because the region is a significant biodiversity-rich area which today is in critical condition.

A survey of the literature was carried out as an initial step for the project.

A brief communication was sent to women and men working in biodiversity at all levels throughout India, asking them to provide useful information for this project, including their curricula vitae indicating their area of specialization, publications, years of work experience and so on.

Development of a database on women and men working in biodiversity conservation and management and publication of the MSSRF book, *Gender dimensions in biodiversity management*, edited by M.S. Swaminathan, were outcomes of this project.

#### **Gender-based roles in conservation**

The MSSRF project showed that gender roles in biodiversity management are socially constructed rather than biologically determined. The project found wide variations in the tasks assigned to men and women in different locations, with the same task, such as seed selection or winnowing, being done by women in some communities but not in others. In areas of traditional agriculture, among communities and classes that did not practise gender seclusion, women's participation in biomass-related activities was high and their knowledge and interest in conservation was apparent. Women's involvement with conservation practices such as preservation of high-quality seed was high in communities where they were the main food producers. Examples are the Apatanis of Arunachal Pradesh and the Garhwalis of the Western Himalayas. The same is true of areas where women shared joint responsibility, such as among the Mizos, Nagas and some hill tribes of the Western Ghats. The project found that changes relating to age and gender were eroding this traditional knowledge base, for example in parts of Orissa. In agriculturally developed areas where market forces had penetrated deeply, such as Tamil Nadu, women were less involved in conservation practices but continued to have a role in seed preservation.

#### **POST-INNOVATION**

##### **The gender dimension in biodiversity management**

One factor that emerged clearly from the MSSRF case studies was that outside interest in local diversity is a significant element in motivating the interest of young people, women and men, in their own environment. This was particularly evident in the revival of local interest in agro-diversity in the Kolli Hills, in the mangrove diversity of Bhitarkanika and in the activities of the Young Mizo Association.

MSSRF case studies in Kerala, Tamil Nadu, Orissa, Arunachal Pradesh, Mizoram and the Lakshadweep Islands, where distinct ecosystems and biological diversity are currently under threat, summarize the gender dimension in biodiversity management. The examples cited are based on innovative research carried out in ecologically rich and biologically diverse areas of India. The following sections highlight gender-based divisions of labour, knowledge, access to resources and roles in biodiversity management.

### **Kerala**

In the Wayanad district of Kerala, men prepare the land and select the paddy seed. Older women may occasionally help but women in general are not allowed to do so. Women mainly carry out weeding, protecting plants from insect damage, harvesting and winnowing. Men and women jointly carry out post-harvest activities. While men make bundles of harvested crops, women carry them to the threshing yard. Women work alongside men cleaning and drying the grains but men alone are involved in seed storage. Young and middle-aged women are not particularly involved in paddy seed selection and storage but are responsible for selecting and storing vegetable seed and tending vegetable gardens.

Vegetables are sown during the month of *kunni* (August-September), a period in which women eat very well and proceed with full stomachs to the fields for sowing. Women use paroth leaves to protect the vegetable garden from pest attacks. Since all seed material is considered sacred, menstruating women are not allowed near any kind of seed store. Despite the oppressive concepts of pollution and purity to which they are subject, however, women do have a say in choosing which varieties of paddy are to be cultivated and in which fields.

Women take care to grow medicinal plants on their household premises. Both women and men of the Kurichiya tribal community have maintained the habitat for several species of medicinal plants through the preservation of sacred groves and associated areas. Kurichiyas use different plant species to make winnowing **pans**, baskets, grain storage units, umbrellas, mats, bows and arrows. These activities are carried out by men, since they are considered too strenuous for women.

### **Kolli Hills**

Women and men jointly carry out agricultural activities, including land preparation. Ploughing is generally men's work but women also use the plough and there is no taboo against this activity. Women are absolutely prohibited from entering the sacred Grove of the Seven Deities at Mettuvillaram.

Women are responsible for seed drying, cleaning, selection and storage and providing the correct quantities of seeds for sowing. For a mixed crop field, the women mix different crop seed material in correct proportions. Men normally carry out broadcasting and sowing in the early morning, while women are busy with household work.

A clear division of gender roles may exist merely because of the conflicting demands on women's time. Transplanting and weeding are women's jobs but both women and men participate in harvesting and threshing. Women have developed simple selection and storage methods for all food grains. The red earth coat, according to women, acts as a pest repellent. In the Kolli Hills, women

pointed out that all grain seeds are dried in the sun and they were confident enough to claim that seed viability is maintained if dried seeds are kept in airtight containers. Women use traditional wisdom and knowledge acquired from their mothers, older siblings and elders, to preserve part of the harvested grains as seed material for future use, thus contributing to conservation and maintenance of crop genetic diversity.

Women are also partners in deciding which crops to plant during the year. During the field study, **MSSRF** scientists often noticed men consulting with women or women interrupting men. Women were more confident than men when giving information to the scientists. There is renewed interest among both women and men farmers to revive and strengthen existing crops. Harvesting different fruits on household premises is done by either women or men, sometimes jointly. Young boys of around 15 are involved in the marketing of fruits; elderly people may also be involved. Women's contributions are significant in food production and processing, although a male member of the family may occasionally help in processing food grains. Women normally work longer hours than men and make a substantial contribution to agricultural and food production. Women are more familiar with plant species useful for health care, such as edible greens and tubers. Women and men collect tubers together. Women, children and old men are involved in gathering firewood and grazing cattle.

#### **Jeypore tract**

In the Jeypore tract at Koraput, Orissa, women and men jointly select the panicles of paddy but women have a greater role in the selection of minor millets and oil seeds. Men plough the land and sow the paddy seed, whereas women do weeding, transplanting and milling. Harvesting, winnowing and storage are done jointly by women and men. Women and men are equally involved in collecting, processing and marketing forest products such as grass, bamboo and resin. Seed storage is mainly a job for women but the storage structures are made by men. In a few areas, there are taboos against women entering sacred groves on the outskirts of villages, in the foothills and on the hilltops. The management of herbal gardens is carried out by both men and women. **All** vegetable crops are cultivated by women but are jointly maintained by both women and men. Women take care of the post-production aspects of agriculture. In Koraput, collecting **water is the duty** of women and **girls but** women and men gather firewood. Grazing cattle and looking after them is the work of both women and men.

#### **Bhitarkanika**

In Bhitarkanika, women and men have knowledge of local health traditions. In

particular, the MSSRF study showed that women's economic roles are determined by caste rather than gender alone. Oriya Brahmin and Kshatriya women are not allowed to leave their homes, thus effectively restricting their economic roles to domestic tasks. Oriya women of other castes, such as potters and weavers, and migrant Bengali women have freedom of movement. A different picture emerges from Bhitarkanika, where all agricultural activities – ploughing and field preparation, raising nurseries, transplanting, harvesting, threshing and storage – are done exclusively by men. Women's only agricultural task is to boil rice before it is dried in the sun. Women are not permitted to enter sacred groves. Women with children aged between seven and ten were observed collecting firewood and fishing. During their field visit, MSSRF scientists observed that young men below the age of 25 served as field guides and knew all the medicinal uses of various plants and mangrove associate species. The roles of women and men in this region are governed first by the caste system and secondly by their economic conditions.

### **Arunachal Pradesh**

The situation is somewhat different in the Eastern Himalayas, in the lower Subansiri district of Arunachal Pradesh, where firewood gathering is traditionally the task of men, although this is now beginning to change. There are no sacred groves in Arunachal Pradesh, except for small forest patches controlled by Buddhist monks, such as at Tawang. Most young women and men want to work on government farms. Ecological knowledge and skills in a tribe like the Apatani are clearly gender-based. Older women identify varieties of paddy suited to different soil conditions and also select pure seed. Men, youths and younger women do not have this skill. However, Apatani women seem less knowledgeable about medicinal plants or less willing to share information. Household activities are sharply gender-based: food production and preparation are the responsibility of women, whereas hunting and fishing are the responsibilities of men and boys. In Apatani villages, men traditionally fetch fuel and firewood from the forest but women do so when necessary. In Nishing villages it is rare to see women chopping wood early in the morning, as men are usually responsible for this task. Generally, the workload on old women farmers is increasing. In Arunachal Pradesh, all crafts are strictly gender-based.

There is no cohesive approach to conservation and sustainable use and development of the rich resource base. The institutional infrastructure is ineffective and the administrative culture weak. There are no effective NGOs. In this context, the prospects are not encouraging for an approach to biodiversity management that takes gender considerations into account.

### **Mizoram**

In Mizoram, the northeastern hills of the Pakhuiu mountains are protected by their topography and by the local belief that the mountain is guarded by a spirit that will harm anyone who enters. Burning, forest clearing, protection and harvesting are done by both women and men. Women are fully responsible for sowing, weeding and storing. Site selection is assigned by drawing lots among male family heads only. All other tasks involved in the slash-and-burn cycle are done jointly or by women alone. Seed storage within the household is the responsibility of women but seed selection may be done by women or men. Harvesting is done jointly. Women and men collect firewood and water. Men construct houses but women are sometimes involved in traditional technologies such as blacksmithing. Small-scale trade is completely controlled by women. This spirit of cooperative organization needs to be channelled both to improve women's status and to conserve the biological diversity of Mizoram.

### **Lakshadweep Islands**

On the basis of interviews with ten women and ten men, it became clear that women show interest in planting trees of economic and food value around their homes, whereas men show interest in planting trees that provide fencing for their homes and in introducing ornamental garden plants. Coconut plantation, harvesting and pest control are carried out by men, while women do the early management of the coconut nurseries and assist the men in post-harvest operations. Both women and men spend at least two hours a day harvesting, tending and processing activities and both are conscious of the use of medicinal plants. There is a story that when a botanist visited Minicoy and needed help from the local population to compile a list of all the useful plants, a woman told him his task would not be simple because he would have to list all plants, since there are no useless plants. Economic roles are sharply demarcated and women's and men's ecological knowledge is also distinct. Women are more conversant with the resources around their homes and along the reef and shore, while men, who go further to fish and collect coconuts, are more knowledgeable about the land, lagoon and sea.

### **LESSONS LEARNED**

The lessons learned from this innovative survey and research have resulted in a number of follow-up proposals.

One of the overriding lessons was how age, class and caste determine roles in biodiversity management conservation and agro-biodiversity. After surveying the available literature, a draft was prepared and sent to nearly 40 selected

participants. This draft was then discussed at a workshop and on this basis a final draft was prepared including all the comments and suggestions of the participants. On the basis of a brainstorming workshop held at Chennai on 9-10 June 1997 to review the MSSRF research project Gender Dimensions in Biodiversity Management: India, the following recommendations were drawn up for an Agenda for Action at national and international level. Action research programmes were recommended to integrate the gender dimension in the following three areas:

- conservation: *in situ*, *in situ* on-farm and *ex situ*;
- sustainable utilization;
- ethics and equity in sharing benefits.

### National level

**The gender dimension in proposed national legislation.** Legislation on farmers' rights, national biodiversity and the protection of plant varieties, currently being drafted by the Ministry of Environment and Forests and the Ministry of Agriculture, must integrate gender considerations.

**Panchayati raj (local bodies) institutions and biodiversity management.** The goal should be the establishment of a National Community Biodiversity Movement arising from the efforts of *panchayati raj* institutions and people's participation. Examples of such participation are the Kerala Sastra Sahitya Parishad, the Young Mizo Association and wider networks such as the National Alliance for People's Movements and networks of women's groups. Suitable training modules for the technical empowerment of women and men in *panchayati raj* will have to be developed.

**Policy makers' workshops.** It is essential that policy makers' workshops on context-specific and gender-concerned integrated studies be held periodically for all levels of biodiversity management,

**Gender and national forest service personnel.** Since the ratio of women to men in the central and state forest services at officer and ranger levels is very low, the Ministry of Environment and Forests has been asked to set up a Gender and Forestry Task Force. The agenda for the task force would be to **look** into the conditions of recruitment and service of women at the officer, ranger and forester levels, including age at entry, qualifications and physical criteria of recruitment, training, support structures and career development.

**Priority areas for conservation.** The Global Convention on Biological Diversity (CBD) recognizes biodiversity as the sovereign property of a nation. However, India runs the risk of losing its biodiversity wealth unless immediate and urgent steps are taken in the Western Ghats, the northeast region, the Jeypore tract of

Orissa and the coastal ecosystems.

Simultaneously, the voice of nascent women's groups in these biodiversity-rich areas needs to be recognized and strengthened and their organizations need to be extended, so that biodiversity management can have some beneficial impact on gender relations both in the short and the long term.

**All-India Coordinated Project.** Although some small initiatives are being undertaken, there is a need to carry out an All-India Coordinated Project on Gender and Biodiversity with joint support from other bodies such as the:

- Indian Council of Agricultural Research (ICAR);
- Indian Council of Forest Research and Education (ICFRE);
- Indian Council of Medical Research (ICMR);
- Council of Scientific and Industrial Research (CSIR);
- Indian Council of Social Science Research (ICSSR);
- University Grants Commission (UGC);
- Department of Biotechnology (DBT);
- Department of Science and Technology (DST).

**Public awareness and participation.** Mass media and educational institutions can play a key role in this area; information material should be prepared for this purpose. Different forms of communication should be mobilized and modern information technology used to document, validate and disseminate information on the intellectual property rights of communities. Media messages should be gender-sensitive.

#### International level

Recommendations were made to strengthen the activities of **FAO** and other international organizations in the field of gender and biodiversity management.

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