FAO Regional technical consultation

GENDER DIMENSIONS IN BIODIVERSITY MANAGEMENT AND FOOD SECURITY: POLICY AND PROGRAMME STRATEGIES FOR ASIA

CONTENTS

CHENNAI, INDIA, 2–5 NOVEMBER 1999

REPORT

Sponsored by
FAO REGIONAL OFFICE FOR ASIA AND THE PACIFIC
Bangkok, Thailand

Organized by
M. S. SWAMINATHAN RESEARCH FOUNDATION
Chennai, India

ISBN: 974-7846-03-03

TECHNICAL SUPPORT

Revathi Balakrishnan
Regional Rural Sociologist and Women in Development Officer
FAO Regional Office for Asia and the Pacific
Bangkok, Thailand

EDITORIAL SUPPORT

Hemal Kanvinde
M.S. Swaminathan Research Foundation
Chennai, India

Mrs Gita Gopalkrishnan
Chennai, India

FOR COPIES WRITE TO

Regional Rural Sociologist and Women in Development Officer
FAO Regional Office for Asia and the Pacific
39 Phra Atit Road
Bangkok 10200, Thailand
Email: Revathi.Balakrishnan@fao.org

COVER PHOTO

Local food items sold in the weekly market by women - Kalahandi District, Orissa, India
(Photo courtesy : Vijay R. Subbiah).

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Foreword

Biodiversity is the basis for survival and progress of the present and future humankind. Therefore, all must strive to conserve, enhance and utilize it in a sustainable manner. Women have played and will continue to play a vital role in this resolve.

I congratulate the organizers of the technical consultation on *Gender dimensions in biodiversity management and food security: policy and programme strategies for Asia*. The consultation was organized jointly by the M.S.Swaminathan Research Foundation of India and Women in Development Programme of FAO Regional Office for Asia and the Pacific, Bangkok.

This report is the outcome of the technical consultation in which scientists representing various disciplines in social and biological sciences came together to develop strategies for integration of gender dimensions in biodiversity research and programme. The consultation epitomizes the organizational objective of FAO to build multidisciplinary partnership to foster integration of gender considerations in normative and operational programmes to ensure food security.

The report presents a summary of the status of gender differentiated roles in local production systems that define the gender specific responsibility for biodiversity management. Furthermore, the proposed strategies for research and programmes for integration of gender dimensions can serve as guidelines for national research institutions in the Asian region. We welcome the recommendations directed to FAO both in the region and global arena for strengthening social dimensions, particularly gender concerns in the plant genetic diversity management programmes.

The publication highlights the gender concerns in bio-resource management and thus contributes to the expanding knowledge base relevant to the region. FAO is pleased to contribute to the enhancement of global understanding of gender issues in bio-resource management, particularly in the area of biodiversity management.

R.B. Singh

Assistant Director-General

Regional Representative for Asia
and the Pacific

Foreword

M. S. Swaminathan

The 21st century is likely to be known as the “biological century”. Uncommon opportunities have been opened up by gene revolution involving the mapping of the very blueprints of life and the scrambling of genes from altogether unrelated species through recombinant DNA research.

The public good that may emerge during the biological century will depend not only upon innovative and ethical genetic modifications, but equally upon the success of efforts to conserve biodiversity. Biodiversity is the feedstock for the biotechnology industry and greater the efforts in the conservation of genetic diversity, greater will be the scope for generating more meaningful genetic combinations.

Conservation of bio-resources has been part of the culture and ethos of past civilizations. This is why centres of biodiversity often overlap with centres of great civilizations. It is also clear that from the early beginning of domestication of economic plants about 12,000 years ago, women have played a pivotal role in plant selection, domestication and conservation. Historians of domestication feel that when men went out hunting for food, women started selecting plants from the wild and cultivating them. This important step brought about the transition from gathering to growing food plants.

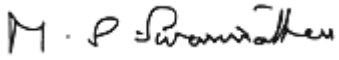
During the course of agricultural evolution, men and women began to specialise in different areas of natural resources management. In the area of bio-resources, women played in the past and are still playing a key role in many societies in the area of post harvest technology, like harvesting, threshing, seed selection and storage. However, with mechanisation gender roles tended to change in industrialised countries. In the tropics and subtropics also gender roles changed with changes in landuse pattern, as for example the diversion of land to plantation crops like tea, coffee and rubber. In many nations in Africa, there is also a gender division in relation to the crops cultivated, with women playing a key role in the cultivation and management of food crops and men more concerned with crops for the market like cotton and tobacco.

The FAO Regional Office in Bangkok and Revathi Balakrishnan, Regional Rural Sociologist and Women in Development Officer, deserve our gratitude for sponsoring a series of studies on the gender dimensions of bio-resources conservation and management in South Asian countries. M. S. Swaminathan Research Foundation (MSSRF) has been associated actively in this significant regional initiative of the FAO with reference to India, Sri Lanka and the Maldives. The present publication contains the highlights and recommendations of the Technical Consultation held at MSSRF at Chennai, India from 2–5 November 1999. The Consultation had the privilege of having the Hon. Begum Matia Choudhury, Bangladesh Minister for Food and Agriculture and the Hon. Begum Zinnatun Talukder as active participants. The participants made many important recommendations which deserve serious consideration and appropriate action by national governments, FAO bilateral and multilateral donors.

Many biodiversity experts believe that we are entering an era of mass extinction with reference to the number of plant and animal species facing the threat of extinction. A major cause for this unfortunate situation is the loss of habitats rich in bio-resources. Women have generally been on the forefront of the environment conservation movement, as for example in the case of Chipko (i.e. hug the trees) movement in the Himalayas. Giving explicit recognition to gender

roles in biodiversity management will be an important first step in the conservation and sustainable and equitable use of bio-resources.

My special thanks go to Revathi Balakrishnan, for her guidance and advice and to Ms Mina Swaminathan and Dr Hemal Kanvinde for their painstaking efforts both in organising the workshop and preparing the publication.



M. S. SWAMINATHAN

Chairman, MSSRF

Chennai
August 1, 2000

ABBREVIATIONS

CBD	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
COP	Conference of Parties
FAO	Food and Agriculture Organiaation of the United Nations
FAO-RAP	FAO Regional Office for Asia and the Pacific
FARM	Farmer centred Agricultural Resource Management Programme
GIS	Geographic Information Systems
GPS	Global Positioning System
IDRC	International Development Research Centre
IRRI	International Rice Research Institute
JFM	Joint Forest Management
MSSRF	M. S. Swaminathan Research Foundation
NGO	Non-Government Organization
PCI	Participatory Crop Improvement
PGR	Plant Genetic Resources
PPB	Participatory Plant Breeding
SAARC	South Asian Association for Regional Cooperation
SEAGA	Socio-Economic and Gender Analysis
TRIPS	Trade Related Intellectual Property Rights
WIPO	World Intellectual Property Organization

I INTRODUCTION

A regional technical consultation on Gender Dimensions in Biodiversity Management and Food Security: Policy and Programme Strategies for Asia was held from 2 to 5 November 1999 at the M. S. Swaminathan Research Foundation. It was jointly organised by the FAO Regional Office for Asia and the Pacific, Bangkok and the M. S. Swaminathan Research Foundation, Chennai (Madras).

The purpose of the consultation was to explore the linkages among household food security and biodiversity mediated through gender roles in a few selected member countries in Asia and the Pacific Region. The dialogue and discussions were to go beyond the physical and agronomic features of biodiversity that influence household food security. It was proposed to examine gender dimensions in community and household as intervening factors that impact on sustainable biodiversity and food security. Hence, the technical consultation rested on two important tenets. First, in the Asia-Pacific region, the smallholding farmer households in the rural communities are the trustees of agro-biodiversity. Second, in these farm households and farming communities, the know-how and strategies adopted to achieve sustainable gains in household food security and conservation of biodiversity are gender differentiated. It was expected that that the deliberations would help scientists dealing with agro-biodiversity and food security problems to widen their perspectives in their research and field programmes.

The focus of the technical consultation was:

- to share case studies and country papers on gender dimensions and biodiversity management from the participating countries in order to identify a common framework and inter-disciplinary approaches
- to examine the current central concerns and innovative approaches for integration of gender dimensions in bio-diversity management
- to identify the policy gaps and programme approach limitations that are barriers to the integration of women's concerns in bio-diversity management as relevant to food security
- to identify strategies and recommendations for national policymakers, programme specialists, and researchers and suggest future areas of action related to the technical themes of this consultation
- to evolve recommendations for FAO in developing normative and operational programmes in the area of gender and bio-diversity management

Eight countries from the Asia-Pacific region were represented in the meeting: Bangladesh, Bhutan, India, Maldives, Nepal, Philippines, Sri Lanka and Vietnam. In addition to country experts, nominees from scientific research institutions and donor agencies also attended. Pakistan's representative sent a paper though he was not able to attend the meeting in person. Case studies and country papers were presented in the technical sessions. Discussions followed each presentation. Innovative approaches and future directions to improve research, programmes, and policies were deliberated. Finally, recommendations to set out an agenda for action were formulated. Taking advantage of presence of experts at the consultation, a media interaction was organised under the auspices of The Hindu Media Resource Centre.

2. INAUGURAL SESSION

I. WELCOME ADDRESS

Revathi Balakrishnan
FAO Regional Office for Asia and the Pacific
Presented for
Director, Women and Population Division
FAO Rome

FAO places great importance on technical work as related to information on gender roles and rural women's concerns in resource management. Recently, in October 1999, FAO organised a high level Ministerial Consultation on Rural Women and Information. Representatives of member countries from the focal Ministries of Agriculture and Food as well as the focal Ministries for Women, Gender, and/or Equal Opportunities attended. Participation was designed to highlight a persistent action gap, manifested by limited or no communication between the technical ministries that FAO collaborates with and the national machineries of women that promote gender-mainstreaming agenda. We hoped to transcend the conventional boundaries of communication among key national policy-making and programme-implementing agencies that could serve to improve the status (economic and social) of rural women in FAO member countries. The outcome was productive and we foresee expanded activities in this area. The emphasis will be to strengthen and improve the content and quality of information on rural women as relevant to FAO technical activities as well as the process of widely sharing such information, including among the general public through the media.

Hence, this technical consultation fits well with FAO's mission and vision. First, the partners have invited participants from a multidisciplinary expertise base. A media workshop was also organised jointly by the Uttara Devi Resource Centre for Gender and Development at MSSRF and *The Hindu* Media Resource Centre. We hope the presentations and dialogue during these events will explore the links between gender roles, biodiversity management, and food security. In the latter half of this century each of these issues has been explored extensively, most often independently of the other. With your co-operation and contributions, FAO seeks to design multi-disciplinary lenses that will improve our gender vision to consistently strengthen gender-equitable policies and programmes.

II. OPENING STATEMENT

Mr. Peter Rosenegger
FAO Representative in India and Bhutan
For
Dr. Prem Nath
Assistant Director General and Regional Representative
FAO Regional Office for Asia and the Pacific

The technical consultation has been organised to explore the role of men and women in managing agro-biodiversity in the countries of Asia and to identify strategies to improve the policies and programmes to be women-inclusive. The focus of the consultation reflects the

commitment of FAO in three issues, namely, food for all, sustainable development, and integration of women as development partners. The UN-Agenda 21 sets the framework for the FAO initiative in the areas of biodiversity and bioresource management. The FAO Global Plans of Action for Conservation and Sustainable Utilisation of Plant Genetic Resources for Food and Agriculture provide the impetus for actions relevant to agro-biodiversity management. The FAO World Food Summit Plan of Action outlines the organisational mandate for food security and defines actions for sustainable management of ecological resources for food security. In Commitment 1, the Plan clearly identifies actions for integration of women in all technical activities of FAO. These instruments for actions as affirmed by FAO member countries are an indication of our joint commitments. Now we seek your active involvement in developing policies and programmes that are gender responsive and sensitive to roles of women and their potential to contribute to agro-biodiversity management.

At FAO, we know for a fact, and by experience of working closely with agriculture and rural communities, that rural women in their multiple roles contribute to food production as well as for sustainability including conservation of plant biodiversity. On a global scale, women produce more than half of all the food that is grown. In South-east Asia and the Pacific, women's home gardens represent some of the most complex plant diversity systems known. But, what is lacking is the relevant information to acquaint policymakers and programme agenda planners to recognise rural women's current contribution to food security and the potential contribution they could make to achieve sustainable food security through biodiversity conservation.

Hence, research in the area of gender dimensions in biodiversity management for food security deserves our attention. FAO has begun the work of documentation of gender roles in biodiversity management both in Asia and Africa. We hope that the work in this technical area of gender dimensions in biodiversity management for food security will expand to be an active FAO global programme. Institutions such as those each of you represent could make a significant contribution to reduce the “data gap” by opening up your research agenda to be inclusive of social dimensions of biodiversity management and to adopt gender responsiveness in setting up biodiversity research programmes.

We acknowledge that research alone is not an end in itself. We hope that quality research will lead to a sound information base that would direct policy formulation and programme development. We should strongly emphasise the three-way integrative flow of gender responsive information between research, policy formulation, and programme development. Such a close integrative process can be made possible only through the commitment and participation of national institutions and agencies.

III. INAUGURAL ADDRESS

Hon'ble Begum Matia Choudhury
Minister for Agriculture and Food
People's Republic of Bangladesh

A study by FAO on Rural Women and Food Security recognises that rural women in Asia play a key role in biodiversity as seed selectors, biodiversity managers in home gardens, and as keepers of local knowledge of food crops, medicinal plants, wild foods and forest products. Asian rural women are also known for their contribution as guardians and managers of biodiversity in the region. There is a very close relationship between agriculture and biodiversity.

We can say that in primitive times, when mankind lived in the caves, the women of those days first discovered seeds, the prime movers of plant life. Since then women's role in agro-biodiversity has continued and is still there today.

Traditionally, peasant women used to play a critical role in areas of seed collection, handling and storage, and in maintaining the biodiversity. It is the woman who conserves, preserves, and germinates seeds in most parts of our subcontinent. The intricate knowledge involved in performing this task is transmitted from mothers to daughters, from sisters to sisters, from mothers-in-law to daughters-in-law or from one village sister to another. Women are the repositories of this vast area of knowledge and, in a true sense, owners of this complex seed technology and know-how. Communities have not only developed elaborate systems of pest management and biological control; they have identified and managed a series of genes conferring valuable traits for commercial and domestic use. It is those genes or traits as diverse as disease resistance, high salt tolerance, resistance to drought or water-logging, which have been maintained in the repertoire of communities and managed by rural women in most cases.

Thus, it would not be entirely correct to say that the ‘feminisation’ of agriculture is a recent phenomenon. If one overlooks the facts of the history of agriculture, one can only be guilty of ‘gender blindness’ arising out of the ‘invisibility’ of women's roles in, and contributions to, agro-biodiversity management and food security. The global survey conducted by FAO has shown that, in Asia, women account for 50 per cent of overall food production in the region. There is, of course, considerable variation by country. In Bangladesh, a survey conducted in 1989 showed that agricultural production (direct and processing) as the primary occupation of 43 per cent of women. It is the secondary occupation of another 15 per cent, making a total of 58 per cent.

What should or can be done to further enhance the participation of women farmers in biodiversity management and food security? Some suggestions are:

- Intensify and promote home gardens and provide needed support.
- Provide women farmers with easy access to agricultural information on appropriate technology to improve upon the existing homestead agricultural diversification practices.
- Give women farmers opportunities to gain technical knowledge and skills to be able to adopt more environment-friendly agricultural production systems.
- Enable women farmers increase their capability to cope with problems encountered in sustainable farming systems.
- Encourage rural women's participation in the community level biodiversity conservation programmes.
- Increase rural women's access to credit to enable them to sustain the process of biodiversity and food security.

The policy issues and future action in the management of biodiversity with respect to food security and gender dimensions should lead to the conservation and potential use of agro-biodiversity for long term economic benefits. In more specific terms, such policies may include:

- increased government commitment to mainstreaming biodiversity in agricultural research and development
- increased participation of the farming community in general, and women in particular, to facilitate incorporation of diversification in farming systems

- institutional arrangements for effective partnership between agricultural research centres, NGOs, farmers, private companies, agricultural extension agencies, and various development agencies for achieving inter-sectoral collaboration
- special programme interventions to harness, sustain, and expand women's role in biodiversity, especially in the backdrop of the commercial process of the seed industry and the much-talked-of Intellectual Property Rights

Policy measures should include protection of farmers' rights and community knowledge in biodiversity management. Simply stated, without ownership rights being given to farming communities, biodiversity cannot be conserved.

The imperatives for such an agenda arises from the fact that all natural resources, including biodiversity, are finite. However, the need for such resources for mankind is virtually infinite. The biosphere, comprising the outer layer of the earth's surface and the lower part of the atmosphere, earlier thought to possess unlimited resources and resilience is now recognised as a delicate system with finite resources and limited ability to recover from misuse or overuse. While non-renewable resources may at one time be completely used up, renewable resources will continue to provide the needs of the people so long as their very base is not depleted or destroyed. Natural resources, whether renewable or non-renewable, must, therefore, be used rationally, economically, and judiciously—so that our need is not jeopardised by the greed of others and the needs of the present do not destroy the prospects of the future.

IV. PRESIDENTIAL ADDRESS

Prof. M. S. Swaminathan
Chairman
M.S. Swaminathan Research Foundation, Chennai, India

On the eve of the UN Conference on Environment and Development held at Rio de Janeiro in June 1992, the Union of Concerned Scientists published an open letter titled *World Scientists' Warning to Humanity* which stated that “human beings and the natural world are on a collision course…if not checked, many of our current practices put at serious risk the future that we wish for human society and the plant and animal kingdoms, and may so alter the living world that it will be unable to sustain life in the manner that we know.” This warning was signed by over 1,600 scientists from leading scientific academies in 70 countries, and included 104 Nobel Laureates.

I wish to take biodiversity, one of the key components of our basic life support systems, as an example to illustrate what changes are needed in the management of our biological resources. It is now widely realised that the genes, species, ecosystems and traditional knowledge and wisdom that are being lost at an increasingly accelerated pace limit our options for adapting to local and global change, including potential changes in climate and sea level.

Another important paradigm shift witnessed in recent decades in the area of management of natural resources is the change in the concept of ‘common heritage’. In the past, atmosphere, oceans and biodiversity used to be referred to as the common heritage of humankind. However, recent global conventions have led to an alteration in this concept in legal terms. Biodiversity is now the sovereign property of the nation in whose political frontiers it occurs. The global

commons for example the oceans, can be managed in a sustainable and equitable manner only through committed individual and collective action among nations.

Biodiversity and Human Security

While we have some knowledge of variability at the ecosystem and species levels, our knowledge of intra-specific variability is poor, except in the case of plants of importance to human food and health security. What kind of action will help us to ensure not only the conservation of biodiversity, but also its sustainable use? I would like to discuss this issue with reference to two major threats to biodiversity in general, and agro-biodiversity in particular:

- Habitat destruction
- Genetic homogeneity in farming systems

Habitat Destruction

How do we arrest the trend of habitat destruction and prevent further genetic erosion? I would like to summarise briefly the approach adopted in India as well as at our Research Centre in Chennai (Madras) to foster an Integrated Gene Management strategy in the country. We use the term ***management*** in the context of natural resources to include conservation, sustainable use, and equitable sharing of benefits. It is only such a concept of management that can result in the conservation as well as enhancement of natural resources.

The Integrated Gene Management system includes *in situ, ex situ* and community conservation methods. The traditional *in situ* conservation measures comprising a national grid of national parks and protected areas are generally under the control of government environment, forest, and wildlife departments. The non-involvement of local communities in the past in the sustainable management of forests has resulted in a severe depletion of forest resources in India. It has become clear that sole government control alone will not be able to protect prime forests or regenerate degraded forests.

Community Gene Management

Both *in situ* on-farm conservation of intra-specific variability, particularly in plants of food and medicinal value, and *ex situ* on-farm conservation through sacred groves have been part of the cultural tradition of rural and tribal families in India. In the Old Testament also, there are several references to sacred groves. Gadgil and Vartak (1975) defined sacred groves as tracts of forest that have been completely immune from human interference on the basis of religious beliefs. Unfortunately, several of these beliefs are now tending to disappear. It is only by giving explicit recognition to the pivotal role of community conservation in strengthening ecological, food, and health security systems that we can succeed in the revitalisation of these conventions. In national integrated gene management systems, *in situ, ex situ* and community conservation methods should receive adequate and concurrent attention. A recognition and reward system, based on FAO's concept of Farmers' Rights and the Convention on Biological Diversity's (CBD) provisions for ethics and equity in benefit sharing, should become an integral part of national legislation in the fields of biodiversity conservation and plant variety protection.

Participatory Forest Management

The Participatory Forest Management (PFM) procedure became a significant turning point in the history of forest management in India as well as other Asian countries (see Samar Singh *et al*, 1997 and Mark Poffenberger *et al*, 1997). The essential feature of this system is that the state and community become partners in the management of the forest resource. The state continues to own the resource but the benefits are shared. Access to non-timber forest products becomes an important avenue of sustainable livelihoods to the forest-dependent communities. ***Thus, the community develops an economic stake in the preservation of forests, leading to conservation and sustainable use becoming mutually re-inforcing components of a Forest Management Policy.*** The experience gained in India in the last 25 years shows that the process of natural forest degradation can be reversed through PFM and that forests can provide non-wood forest products to the local community on a continuous or seasonal basis, if there is a more widespread understanding of their regenerating capacity. Since forests are the habitat for a large proportion of naturally occurring biodiversity, saving forests results in saving genes.

Biosphere Management

In 1994, MSSRF conducted a detailed study of the threats to the Gulf of Mannar Biosphere Reserve in Tamil Nadu, one of the 9 Biosphere Reserves in India. The study showed that unless the livelihood security of the impoverished families living in that area can be strengthened, unsustainable exploitation of biological resources will continue.

Between 1996 and 1998, MSSRF worked on a proposal for bringing the Gulf of Mannar Biosphere Reserve under a participatory management mode. The project proposal was approved by the Global Environment Facility (GEF) Council at its meeting held in May 1999 and commended as a model that deserved to be widely emulated by those preparing similar projects. The Scientific and Technical Advisory Panel (STAP) of GEF endorsed the project for approval with the following remarks:

> The project addresses a major challenge, namely, the conservation of coastal biodiversity of the highest ecological value in a large area subject to considerable pressure from poor populations upon the sole resources that appear to be at their disposal. To meet this challenge, the project follows the only framework which can succeed, namely, to combine the necessary protection of the threatened ecosystem and ecological processes with economic and social benefits which will meet the essential needs of local people, through providing appropriate institutional, financial, and managerial arrangements.

The management structure through which people and nature will be united in the area is through a Gulf of Mannar Biosphere Trust. Representatives of fishermen and rural communities as well as all the principal civil society stakeholders will, together with government representatives, form the members of the Trust. It is hoped that the Gulf of Mannar Biosphere Trust, whose long term sustainability will be ensured with the help of a Trust Fund, will show the way for promoting a ***management-by-partnership*** system of governance in all the other Biosphere Reserves in the country.

There is a proposal to develop a similar plan for the Similipal Biosphere Reserve, one of the tiger reserves, in collaboration with the Government of Orissa. The result of this program will be the establishment of a Similipal Biosphere Trust managed jointly by the major stakeholders.

A major need in such programs is the strengthening of the livelihoods of the poor families living in the vicinity of the Biosphere Reserve. For this purpose, the biovillage model of livelihood security will be introduced in the villages around the Reserve. The biovillage concept of human-centred rural development aims to address concurrently the challenges of natural resources conservation and poverty eradication (Swaminathan, 1999). Market-driven livelihood opportunities will be identified and local families will be assisted in taking to them with the help of institutional credit. The steps involved are:

- micro-level planning with GIS maps
- micro-enterprises identified on the basis of market needs
- micro-credit
- industry support for contract cultivation by small farmers on the basis of buy-back agreements

Genetic Resources Enhancement and Sustainable Use

Tribal and rural farming communities have a long tradition of serving as custodians of genetic wealth, particularly landraces often carrying rare and valuable genes for traits like resistance to biotic and abiotic stresses, adaptability and nutritional quality. Farmers for religious ceremonies preserve several land types that carry valuable genes and they constitute valuable material for conservation and sustainable use.

Local landraces are still being maintained largely by the tribal poor. Such poverty-ridden custodians of genetic wealth are increasingly confronted with severe socio-economic problems that are rendering the maintenance of their traditional conservation ethics difficult. ***Steps are urgently needed to link their conservation efforts to the strengthening of their livelihoods***.

It is now widely recognised that the conservation continuum consists of the following three links.

In situ		*In situ*		*Ex situ*
Conservation of habitats	→	On-farm conservation by rural and tribal communities	→	Conservation through botanical and zoological gardens and cryogenic preservation

While the two ends of this conservation chain (namely, *in situ* and *ex situ*) receive support from public funds, in situ on-farm conservation by rural and tribal women and men remains largely unrecognised and unrewarded. Yet, this link in the chain is responsible for the conservation of valuable intra-specific variability. MSSRF's partnership with local communities and government agencies is designed to strengthen this neglected component in the conservation chain.

For this purpose, a Community Gene Management System is being developed, initially in three pre-dominantly tribal, biodiversity-rich districts of Orissa—Koraput, Khandamal, and Kalahandi known for their variability in rice and millets.

The Community Gene Management System (CGMS) comprises the following:

- Field Gene Bank (FGB) at the village level
  In situ on-farm conservation by rural and tribal families
  Participatory breeding (selection)
- Area Seed Bank (ASB) at the level of a cluster of villages
  Conservation of representative samples of seeds in seed stores
  Insurance against total loss of seeds during drought years
- Community Gene Bank and Herbarium (CGB)
  Cryogenic preservation
  Evidence for getting tribal families reward and recognition under the proposed Plant Variety Protection and Farmers' Right Act

Field Gene Banks are basically *in situ* on-farm centres of conservation. Landraces and location-specific plant genetic resources (PGR), usually identified on a participatory basis with the local families, are conserved in FGBs. The local landraces are periodically grown in their native habitats for seed renewal. They serve as effectively decentralised and highly cost-effective arms of a community gene management system. The FGBs would ensure *in situ* on-farm maintenance of landraces and preservation of the cultural and cropping practices under which PGR acquired their distinctive traits.

Several FGBs can be linked to an Area Seed Bank (ASB) taking into account factors like distance, communicability, conservation space, and the like. There could be two to three seed banks in a district. The ASB will help to strengthen coping mechanisms for facing the problem of seed scarcity caused by drought-induced crop failures.

One or more ASBs will be linked to the Community Gene Bank (CGB). The CGB would hold *ex situ* the seed stocks of landraces, etc., along with herbarium sheets and other information needed to get the primary conservers reward and recognition under the proposed Indian Act for Plant Variety Protection and Farmers' Rights. The CGB could deposit duplicate sets of accessions in the National Gene Bank (NGB) of the National Bureau of Plant Genetic Resources at New Delhi.

The operational efficiency, low transaction costs, and conservation potential of such a network will encourage their replication and implementation at state and national level. Thus, an effective integrated national gene management system can be built up. The Community Gene Management System provides an opportunity for fostering symbiotic partnerships between rural/tribal society and scientists in areas like participatory breeding and the development of new varieties adapted to local conditions using novel genetic combinations provided by genetic enhancement centres.

Genetic Homogeneity

Genetic homogeneity associated with mono-cropping and modern agriculture leads to the replacement of large numbers of local varieties with a few high-yielding strains. Varietal diversification and crop rotations involving crops with non-overlapping pest sensitivity are important for sustainable agriculture. The transition from ‘green revolution’ to an ‘ever-green revolution’ involves the substitution of a commodity-centred approach by a farming systems approach. The farming systems approach involves the adoption of mixed farming (crop-livestock-fish) methodologies, based on an integrated natural resources conservation strategy.

In most developing countries, particularly in India and China where 50 per cent of the global farming population live, continuous advances in farm productivity per units of land, water, and energy are essential for sustainable food security. Hence, there is need for developing and disseminating ecotechnologies, based on appropriate blends of traditional wisdom and systems with bio-, information, space and renewable energy technologies. The ecological prudence of the past and the fruits of contemporary innovation can then be combined in a symbiotic manner.

With the growing privatisation of plant breeding and expansion of proprietary science, it is important ***that an ecologically, economically, and socially sustainable farming systems policy*** is developed for each agro-ecosystem. Such a policy will have to be developed jointly by farming families, official extension agencies, and private sector companies. Unilateral introduction in large areas of one or two genetically modified strains of important food crops could cause irreparable harm in a few years' time both to food security and technological credibility. The pathway to an ever-green revolution on the farm is the adoption of integrated natural resource and gene management strategies.

Gender Dimensions of Biodiversity Management

It is important that in all these aspects of a community-centred integrated gene management strategy, gender roles in all approaches to genetic resources conservation, sustainable use, and equitable sharing of benefits are given attention. Women in many developing countries are the primary seed selectors and savers. Their contributions to the evolution of a biodiversity conservation ethic should be fully recognised in any system which is designed to operationalise the equity in benefit sharing provisions of CBD.

If we promote a worldwide community-centred integrated gene management strategy, we will soon stop hearing about disappearing species and vanishing landscapes and habitats. None of the policies and procedures I have suggested is difficult to implement. By recognising that conservation efforts represent a continuum, with rural and tribal families performing a vital function in preserving precious genetic variability in important plants and farm animals, we will be able to attend to all the links in the conservation chain. Community conservation is a value-added link in the conservation system, since local families not only conserve but also add value to the conserved material through selection and information.

If the twentieth century was a period of understanding and chronicling threats to biodiversity and bioresources both in land and water, let us hope that the twenty-first century will be one where the threats are terminated and benefits harnessed for a better common present and future for humankind.

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3. INTRODUCTORY TECHNICAL PAPERS

I. GENDER DEFINED STRATEGIES FOR BIODIVERSITY MANAGEMENT FOR HOUSEHOLD FOOD SECURITY

Revathi Balakrishnan
Regional Rural Sociologist and Women in Development Officer
FAO Regional Office for Asia and The Pacific

Abstract

As defined by FAO, the three aspects of food security are availability, access, and stability. In all three dimensions, at the micro level, food security concerns are associated with the capacities of persons and households to produce, buy, and use food of the right quantity and quality at various phases of the life cycle and seasons. Within the groups of individuals and households, it is important to differentiate the relative status and roles of women and men in achieving desired food security. These households and communities organise production and resource management around gender division of labor and responsibilities. An important safety net for marginal and small farmer households could be supporting agro-biodiversity as a risk reduction formula in food production. Rural women play a key role in such agro-biodiversity based food production systems. The current global view is that rural men and women are the managers of biodiversity and hold in-depth knowledge of local plants and are thus community custodians of plant genetic resources. Thus, an equitable partnership with these grassroots level plant genetic resource managers should be sought, guided by a sound understanding of their wealth of knowledge and dependency on biodiversity. Placed in the framework of FAO's mission of Food for All, an environment rich in biodiversity could advance the ability of farm households to increase food production, or improve the access to food directly or through provision of livelihood options to obtain an income to access food.

Biodiversity and food security interactions can be viewed incorporating a gender perspective under three categories with implications for small farm households. These are i) Farm crop diversity and household food security; ii) Home garden diversity and household food security; and iii) Forest resource biodiversity and households' livelihood and food security. In all three categories, studies relevant to the SAARC region illustrate the role of men and women in biodiversity management. The motivating factors for preserving native plants differ between men and women. Men tend to be more interested in the market value of the species, while women may be more interested in their culinary and nutritional value. In areas where there is out-migration of men leading to the feminisation of agriculture, women tend to conserve a wide range of food and medicinal plants for ensuring household food and health security.

Management of plant biodiversity for food and agriculture thus includes a social dimension. Hence, the global agenda for biodiversity management has to be reviewed within the framework of socio-bioscience interfaces or simply, socio-economic dimensions of biodiversity management as they impact on sustainable food security. The socio-economic dimensions of biodiversity management at the farm household context include the dimensions of gender roles and gender-differentiated indigenous knowledge as inputs to agricultural production and utilisation of forest resources. Systematic documentation of gender roles in biodiversity management has to be pursued to overcome the existing paucity of information. Such research-

based information should support policy and programme formulations in the area of conservation of plant genetic resources for agriculture.

Discussion

FAO Women in Development Technical Programme for gender and sustainable natural resource management includes within its purview, recognizes that biodiversity security means food security for most of the Asian nations. Country-based studies on gender dimensions of biodiversity management have given insights on the gender-based roles of men and women in agriculture, home gardens, and local resources management. In some countries, even children play a vital role in natural resource management.

FAO has developed Socio-Economic And Gender Analysis (SEAGA) training programmes and frameworks for gender analysis in various sectors. There is a need to develop a gender sensitive database on knowledge systems, which could be used to ensure intellectual property rights. In particular SEAGA sectoral guide for plant genetic resources could be use to researchers in regional member countries. It is currently being tested in African region.

There are varying depths of understanding among policy makers, governments and scientists about the value of women's work. For example, in Viet Nam, each Ministry has a focal committee on women through which the FAO can reach the local people. Each donor agency has its own agenda—IDRC has given more emphasis to livestock than to biodiversity in their studies. FAO is working on exchanging information with various donor agencies. FAO Link project funded by Norway helps to link the programmes in African countries and Asia could also be linked.

II. INVOLVING WOMEN, IGNORING GENDER

Ms. Sumi Krishna
M.S.Swaminathan Research Foundation, Chennai, India

Abstract

This paper is based on a review of case studies on the gender dimensions of biodiversity management in Bhutan, Nepal, Maldives, Sri Lanka, and India. It emphasises that biodiversity management and food security are human problems, which are of particular concern to women because of the gendered division of agricultural, domestic, craft, and other work. This gendered division, however, is very variable over space and time, proving that such differences are based on socio-cultural factors rather than on biological/ natural differences between women and men. Class, religion-caste, ethnicity and gender, besides age/stage in the life cycle, determine women's visibility, mobility, access to and control of resources, knowledge, and income.

The case studies reflect the male bias in formal biodiversity management, which uses women's knowledge, skills, and labour to increase programme efficiency, but tends to exclude them from participating in new information and technology. The paper discusses various obstacles to women's participation, the need for male support, and the gender-sensitivity of men and women professionals. Women field workers who are stepping across accepted gender stereotypes face many gender-specific problems—constraints imposed by society, the pressures of their own families, and sexual harassment by male colleagues. To move beyond the documentation of

gender roles to an understanding of gender relations, the paper supports the trend towards multidisciplinary studies. It stresses the need to build upon village women's technical and managerial capacities, and to integrate gender interests in project planning and implementation. The common experience has been that the greatest resistance to participatory and gender approaches is at the senior level.

The paper argues that the gender dimensions of biodiversity management cannot be isolated from the substratum of gender relations between men and women. It points out that male domination of the family, public policy, and institutions obscures women's concerns and interests. The ‘culture of silence’ and the unwritten social laws that condition women to submit to discrimination need to be challenged. Management practices will have to encompass women's long-term needs for personal autonomy, decision-making power, access to and control of critical resources including land and their own labour. Clear strategies are required on how to draw out women's power, and guidelines are needed to develop equity and benefit-sharing mechanisms which specifically recognise women's rights. Programmes for biodiversity management and food security should involve both women and men, transforming gender relations rather than ignoring them.

Discussion

The commonalties and the differences in the approach and results of the studies on gender dimensions and bio-diversity management in the said countries were brought out. The case studies did not follow any single methodology. It was different not only for the different country studies and but also for the various regions of a country, for example, India. In a few cases, the focus was on biodiversity rather than on its management, while in others the authors seemed to take the view that all was well in ancient times and viewed development as a negative item in evolution. Some case studies gender division of labour for many of the biodiversity management activities of the communities.

There was discussion on the means to get women's involvement in local decision making and the necessary legislation. In India, there is a system of local governance by panchayats, where the representation of women is low; studies have shown that women are mere onlookers and the entire local governance is controlled by men. It was felt that gender sensitising of top management is also essential to get results at the ground level.

Studies on the Joint Forest Management systems have shown an increase in women labour, but whether this actually led to greater strategic powers to women is not established yet. Some agricultural interventions also have led to increased labour inputs from women.

Attitudinal changes in people are important to overcome initial resistance of local communities, and as such, a gender sensitive person, whether male or female, is more valuable in field studies.

III. IDRC'S APPROACH TO RESEARCH IN GENDER AND BIODIVERSITY MANAGEMENT

Ms. Elizabeth Fajber
IDRC South-Asia Regional Office, New Delhi, India

Abstract

The International Development Research Centre seeks to enhance the equitable and sustainable use of biodiversity through support to research from the perspective of those who use, manage, and benefit from biodiversity. The ability of different social groups to access, control, and strategically use bio-diverse resources has significant implications for food, nutritional, and health security.

The aim of the Sustainable Use of Biodiversity (SUB) programme initiative at IDRC is to bring the scientific understanding of local perspectives and management of biodiversity into appropriate policy debates in two sectoral areas: options for food security in agricultural and aquatic biodiversity and options for sustainable livelihoods in the local sustainable use of natural products, especially medicinal plants.

The gender division of rights, responsibilities, work, and knowledge is taken as a point of departure to examine and explain the multiple roles of women and men as resource users/ managers. Employing research with gender as a key variable helps to clarify the indefinite boundaries of the household and the family, and the complex ways in which family, household, and community and ecosystem are linked.

Although researchers and policy makers are increasingly aware of the importance of gender issues, research is often 'gender neutral'. That is, researchers employ units of 'household' or 'community' uncritically and do not deconstruct the heterogeneous power and gender relations among those units. Similarly, technologies and macro-policies are viewed as gender-neutral. It is critical to move to a deeper analysis, one which facilitates proactive action which informs and supports mechanisms for positive social change. For example, investigations are needed as to how processes of increasing commercialisation and economic growth impact women and men's access to use and control of plant genetic resources differently. How are women and men involved differently in the collection and production and distribution and consumption of these resources and derived products? Research which directly investigates these issues and increases understanding of the power/knowledge relations of men and women can help to develop gender sensitive interventions and policies and create a space for women to improve their position and bargaining power.

What approaches and tools can support the integration of gender into biodiversity research, development, and policies? IDRC has developed some tools for its research partners. *Guidelines for Integrating Gender Analysis into Biodiversity Research* relate some of the key concepts of gender and gender analysis. "Gender Resource Kit: Readings and Resources for Community-Based Natural Resource Management for Researchers" includes reading both of a theoretical and practical nature on integrating gender into research on natural resources. In addition, project-based workshops with aims of building gender research capacity to specific research teams directly applicable to their project are conducted. The liaison of research partners with resource people who have expertise in gender research is facilitated, as well as the development of an international database. Information about results, experience and methodologies is shared among research partners.

Discussion

The three introductory papers drew certain conclusions. The country case studies conducted under the auspices of FAO's Regional Office for Asia and the Pacific proved the worth of home gardens as tools of conservation and confirmed the feminisation of agriculture. Women carry out most of the work in subsistence agriculture. Men are migrating to the cities for remunerative employment, so more and more women are used as agricultural labour. The burden of work and lack of time lead women-managed farms to lose out on multiple food crops that they usually grow, endangering the food security of the family.

Affluence denies access to natural resources. Women manage and decide on cropping patterns in subsistence farms, while in large farmlands the male farmers decide on all farming activities. Thus, women are denied access and decision making powers as affluence increases in farming communities. Affluent farmers hire agricultural labour and the women of the family manage only the post-harvest activities.

Skills training in agriculture is usually given to men, yet women maintain most of the crops.

Plant genetic databases/inventories do not have gender differentiated information.

Case studies that deal with biodiversity management should also look into food cultures, which would explain most of the agricultural processes of the area.

Interaction between agricultural graduates and farmers should be increased. A suggestion would be to increase the on-farm work experience of agriculture students as has been tried out in the Tamil Nadu Agricultural University in Coimbatore, India.

4. COUNTRY PAPERS

(in alphabetical order)

I. BANGLADESH[1]

Hon'ble Zinatun Nesa Talukdar
State Minister for Women and Children Affairs
People's Republic of Bangladesh

Abstract

Women constitute about half the population of Bangladesh, and 80% to 90% of them live in the rural areas. Agriculture is the mode of life for most of the population. Traditionally, women were involved in the post-harvest processes. However, in recent years they are also working in the fields in weeding and thinning, watering and irrigation, and in transplanting. Homestead gardening, and planting and maintaining trees are getting increasingly popular too.

Unfortunately, women's access to new information and technologies has been limited by their low literacy rate, social limitations, time-consuming household work, lack of skills training, and scarce employment opportunities. This has had an adverse impact on the quality of women's agriculture related decision-making powers.

Bangladesh has recognised that urgent and far-reaching steps have to be taken to redress this situation. The Constitution of the country emphasises the importance of agricultural and rural development and aims to provide equal access to resources and opportunities, especially to women. In this context, the Fifth Five Year Plan (1997–2002) has formulated objectives to promote women's economic self-reliance. They include implementing specific economic, social, agricultural and related policies and programmes in support of poor female-headed households; mainstreaming women's concerns in agriculture and rural development; reducing the gender gap in literacy rates and educational opportunities, including skills development and technical training; and, recognising women's role and concerns in environmental and natural resources conservation and management.

Discussion

The focus was on the role of NGOs in integrating women in field activities in the spheres of social and economic development. There are several NGOs in Bangladesh that work on children's and women's health and on micro-credit schemes that try to eradicate poverty. The areas of biodiversity and food security are not covered by the NGO sector.

Biotechnology-generated food products would perhaps better help to overcome malnutrition as against natural products. The education of the public to change food culture and habits is crucial.

[1] Papers were presented by two Bangladesh participants.

AGRICULTURE MANAGEMENT SYSTEMS IN BANGLADESH

Dr. Nilufer Hye Karim
Bangladesh Rice Research Institute, Gaziapur, Bangladesh

Abstract

Bangladesh has a population of 121 million people and by 2020AD it is expected to reach 170 million people. The food requirement for the population can be met by production on 32 million ha. While Bangladesh has 11.57 million ha. of agriculture land. Thus food security for the next generations is a challenge that will be addressed by the Ministry of Food and Agriculture. Agriculture production is the largest contributor (28%) to the GDP of the country. Of the total agriculture production by the country, crops contribute to 76%, fisheries and livestock 8% each.

Bangladesh has an inherent bio diverse environment and thus is able to grow diverse crops such as cereals, jute, beverages, pulses, oil seeds, fruits and vegetables.

Women constitute 48% of the total population. Above 80% of the population live in rural areas. The involvement of women in farming can be estimated by the contribution to on farm (68%) and non farm (32%) in rural households. The farming activities where women play an important role are fieldwork, homestead gardens, agri-wage labour, fisheries and livestock. In a study on seed preservation carried out in the BRRI, it was observed that 66% of the agriculture related decisions were made by men, 11% by women and 23% of the decisions were jointly taken.

In order to promote the development of women in all sectors the Ministry of Women and Child Welfare have developed a Nation Action Plan. Some of the highlights with regards to agriculture development of the plan are:

- Include adequate representation of women as members of governing Bodies of the Bangladesh Agriculture Research Council and promote the recruitment of women in policy making, management and as research scientists
- To provide facilities for women block supervisors who work in the villages
- Training in gender analysis to all staff and at all levels including management, personnel and research scientists.
- To revise the planning format and checklist and undertake advocacy programmes to sensitise people of the benefits accrued to the nation and to the community due to women's roles and participation in agriculture.
- Specify allocation for women in revenue and development budgets
- Promote rural based women oriented small business opportunities
- Advocate to include homestead gardens as a production unit in National Statistics
- Improve women's access to agriculture and related information
- Develop better monitoring and evaluation methods of the impacts of the policies on women

II. BHUTAN

Ms. Cheki Wangmo
National Biodiversity Programme, Ministry of Agriculture
Royal Government of Bhutan

Abstract

Bhutan of the Eastern Himalayas with an extensive forest cover, is considered one of the prominent global biodiversity hotspots. Climate and geography, as well as cultural factors, have contributed to an enormous biodiversity in the local fauna and flora, and high levels of biodiversity in agriculture. The largely rural population of Bhutan depends on a diverse range of plant genetic resources (PGR) from both the forests (wild) and farmlands (domesticated areas) for daily sustenance and survival. PGR in Bhutan includes non-timber forest products, wild food, medicinal plants, fodder species, field crops, and horticultural crops.

The Bhutanese people have been living in a sustainable mode in harmony with their surrounding environment. People have nurtured the biodiverse environment and benefited from such diversity. However, increase in population and the associated problems have led to a greater exploitation of these resources and an imbalance in maintaining sustainability. The government's current policy is now directed towards increasing the nation's food supplies through conservation, and sustainable use and management of the existing natural biological resources for self-sufficiency in food.

No gender specific case studies have been carried out relating to biodiversity management and food security in Bhutan. Some studies, however, indicate gender specific roles associated with biodiversity management and conservation in rural areas, which have implications for the future management of the country's natural resources, in particular PGR for food and agriculture.

Discussion

In Bhutan, 70% of land ownership is held by women. There is no discrimination in the country against women. Gender segregated data is not available. In the extension services, there is a predominance of men, but they are slowly becoming gender sensitive. Such a gender-sensitive transformation could help in reducing the internal biases among women that are barriers to interacting with men who are outsiders and represent various institutions.

III. INDIA[1]

FAO-MSSRF STUDY - 1997 ON GENDER DIMENSIONS AND BIODIVERSITY MANAGEMENT

Dr. Hemal Kanvinde
M.S.Swaminthan Research Foundation, Chennai, India

Abstract

Women play a central role in the conservation, management, and use of biodiversity, yet their contribution is often overlooked. They are relatively 'invisible' partners from the grassroots to the policy making level. If biodiversity is to survive, both 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, how and why—in development efforts, to promote true partnership and ensure the sustainable conservation and use of biodiversity now and in the future.

The gender analysis of the roles that women and men play in managing bio-resources is a comparatively unexplored but crucial subject, which allows us to re-think current practices and understand the gender dimension within them. Equipped with this gender-sensitive knowledge, it should be easier to prevent mistakes of the past and meet the specific needs, opportunities, and constraints of both women and men in the future.

Each of the seven case studies covered in this paper—from Wayanad, Kolli Hills, the Jeypore Tract, Bhitarkanika, the Lakshadweep Islands, Arunachal Pradesh, and Mizoram—represents a distinct ecosystem or region of significant biological diversity currently under threat. Moreover, the studies highlight dynamic communities in different stages of transition and development, where livelihood security may conflict with the requirements of biodiversity management.

The studies found that gender roles are socially constructed rather than biologically determined and there are great variations in the tasks assigned to men and women in different locations. 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 women's knowledge and interest in conservation was apparent. In communities where women were the main food producers, women's involvement with conservation practices (such as the preservation and maintenance of quality seed) was high. However, the project also found that this traditional knowledge base of both women and men was being eroded, with changes relating primarily to age and secondarily, to gender. In agriculturally developed areas where market forces had penetrated deeply, women were less involved in conservation practices but continued to play a role in seed preservation.

[1] Papers were presented by three Indian participants.

The research clearly pointed out that there is no simple or uniform division of labour, skills and knowledge along gender lines. Secondly, the research demonstrated 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 to offer a precise assessment of the impact of these innovative studies. The exercise represents an initial attempt to understand the linkages between gender and biodiversity, and highlights a number of gender considerations in conservation and resource use. It therefore 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 biodiversity wealth unless immediate and urgent steps are taken in the Western Ghats, the northeastern region, the Jeypore tract of Orissa, and coastal ecosystems. Simultaneously, the voice of nascent women's groups in these biodiversity-rich areas needs to be recognised and strengthened, and their organisational units need to be extended, so that action to manage biodiversity achieves short and long-term success.

There is a need to initiate action research programmes designed to integrate the gender dimension in the following three areas: (a) conservation—*in situ, in situ* on-farm and *ex situ* (b) sustainable utilisation and (c) ethics and equity in sharing benefits.

Discussion

The Indian government has taken up formal types of conservation practices such as the Reserved Forests and the National Parks and Sanctuaries, and the National Gene Banks. It has also tried to involve local stakeholders in the management of the forest resources in a limited way through the establishment of Joint Forest Management (JFM) Committees. The JFM experiment started as a trial in West Bengal and has been adopted by nearly all the state governments. Initially the programme did not envisage the participation of women, but after a decade the JFM rules say that both men and women from the same family have equal ownership of the resources from the intervention, or the non-timber forest produce.

India has diverse ecological regions each with a unique system of agriculture. Examples from different regions of India on the diverse cropping patterns and multiple and mixed cropping practices as means of ensuring food security highlighted the local agricultural diversity and the role of the community in in situ on-farm conservation. There are regions where traditional crops are disappearing due to the intrusion of commercial agriculture and due to changes in the food habits of the people. This loss of diversity has implications for gender roles and gender relations and subsequently it impacts on food security.

The concept of Community Biodiversity Registers is to inculcate a feeling of pride and build an institutional mechanism in providing for the conservation of the local biological diversity. Though Global Positioning Systems (GPS) are good tools in collecting information on biodiversity, it is practically difficult to provide GPS monitoring systems to all villages. Geographical Information Systems (GIS) have, in fact, been used in developing a participatory management plan for India's Gulf of Mannar Biosphere Reserve.

LINKAGES BETWEEN BIODIVERSITY AND BIOTECHNOLOGY

Dr. Sudha Nair
M.S.Swaminthan Research Foundation, Chennai, India

Abstract

Major breakthroughs in gene technology have created a powerful tool for modifying living organisms to devise new products and services. The screening of plants, animals and microorganisms for properties of economic interest is one of the key activities in the life sciences industry. Biodiversity prospecting activities are more established in the pharmaceutical sector but are now being carried out for nutritional and ecological properties as well. Bio-prospecting activities provide a direct link between biotechnology and biodiversity. This has various implications, especially for biodiversity-rich countries like those in the tropics.

Farmers, especially women, need to be provided with ecofriendly technologies which promote natural resources and help in management of environmental degradation. These need to be disseminated through demonstration centres (rural biotechnology centres or biocentres) and through innovative linkages among government, NGOs and the private sector. The interactions and interventions have to be demand-driven.

The thrust areas where biotechnology has established proven technologies are in agricultural biotechnology (chiefly in tissue culture, floriculture, horticulture, hybrid seed production, biopesticides, biofertilisers, aquaculture), in animal husbandry, health sector (herbal products), pharmaceuticals (inclusive of diagnostic kits, vaccines, and the like), solid waste recycling, and bioremediation. Bio-entrepreneurship is gaining ground in all these areas, and women have successfully established enterprises and appropriate interventions at the rural level. Thus, it is possible to increase livelihood security at the household level.

The proposed activity of setting up a Biotech Park, near Chennai, is an example of innovative linkages and partnerships between the government, academia, NGOs, industries, and financial institutions. This would primarily act as an interface between educational/research institutions on the one hand and industrial units on the other. It would help in providing support for women towards equal access to and control over resources including land, water, fuel, common property resources, credit, and technology. It would help in identifying business opportunities for women in urban areas through feasibility studies using the criteria of value addition and market demand. These women, in turn, can provide income opportunities for rural women.

Discussion

Biotechnology parks should be systematically planned from inception through implementation. It is crucial that market linkages of the enterprise be identified before starting a business.

INTERNALISATION OF GENDER CONCEPTS.

Mrs. Mina Swaminathan
Uttara Devi Resource Centre for Gender and Development
M.S.Swaminathan Research Foundation, Chennai, India

This presentation was on the activities of the Uttara Devi Centre for Gender and Development at the M.S.Swaminathan Research Foundation. The issues emphasised included:

- Research Strategies should recognise gender elements.
- Gender invisibility is rooted in unequal power in gender relations.
- Indian women have multiple responsibilities and are now doing work that was earlier done by men.
- Technologies developed for rural women should also allow for the ownership of the technology, the tools, and implements.
- Landless rural women need social and medical security and the enforcement of the Minimum Wages Act.

Discussion

Gender frameworks should be used in orienting project staff on gender concerns in their projects. It has to be understood, however, that field-level realities may limit their effectiveness. The role of extension officers in the success of the programmes underscores the importance of women in the transfer of technology.

IV. THE MALDIVES

Dr. Mohamed Naseem
Ministry of Fisheries and Agriculture, Government of Maldives

Abstract

The Maldives consists of 1,190 islands of which 203 are inhabited with a population of about 280,000. The agricultural sector is the third largest in the Maldives, after fishing and tourism. The female economic activity rate is about a third the male economic activity rate or lower. Equal opportunities exist in education. There is no gender discrimination in the Maldives. The adult literacy rate is at 93% with no gender disparity. The Ministry of Fisheries, Agriculture, and Marine Resources, through the Agricultural Service, is responsible for regulatory, conservation, research, and extension activities. It has eight centres located throughout the country as extension centres through which these activities are monitored and implemented.

Full time farming is very rare in the Maldives. Home gardening is the most common feature in Maldivian agriculture and is managed by women. Home yards are planted with fruit trees such as mango, papaya, banana, lime, and betel leaf. Semi-commercial cropping is carried on in community lands. The most widely grown crop is coconut, both in the home gardens and community lands. Fruits such as breadfruit, mango, banana, taro, papaya, and watermelon and vegetables like betel leaf, pumpkin, chillies, capsicum are widely cultivated in community lands.

The men go out to other islands and even to nearby countries to trade, while the women have full authority over family matters. They look after the children and sometime even parents, and generate income by thatching, weaving, and rope making.

Home-saved seed is very common among the farmers. Sweet potato, cassava, taro and yams, banana, and even pumpkin are propagated vegetatively. There is very little chance of genetic improvement in these planting materials, though such materials are much better than the improved materials available on the market. Medicinal plants have a special place in the Maldives. Medicinal plants are not uprooted during land-clearing activities. The very rare plants used in traditional medicine are even carried from other islands for planting.

There are several constraints facing the development of genetic conservation in agriculture in the Maldives, the most important being the size of the country and the high cost of investments needed to develop agriculture.

Discussion

The country's unique features of coral-based low-lying islands with poor quality soil and insufficient irrigation capacities are not supportive to productive agriculture. The islands also face the threat of salinity intrusion in their freshwater wells. Tourism is the revenue earning industry and all food is imported for the tourists. Local chilli is an important commercial crop. In recent years the government has started to lease islands for commercial growing of horticultural crops. There has been loss of genetic material, though it is not documented, with the availability of imported hybrid seeds. Knowledge systems are also eroding, and food preferences are changing. The sandy soil allows easy leaching into the water lens and thus the use of chemical fertilisers and pesticides is restricted.

There is no gender discrimination. Men and women have equal opportunities for education and work. In the rural islands there is division of labour in the fishing sector. A gender database is available for fisheries, and has been started for the agriculture sector. People depend more on marine life for food than on land-based produce. There are conservation rules and laws in the country, for example, when one coconut tree is cut, two trees have to be planted.

V. NEPAL

Mr. Prem Gurung
International Centre for Integrated Mountain Development, Katmandu, Nepal

Abstract

In Nepal, mountain farmers are extremely vulnerable to household food insecurity. One of the major reasons behind food insecurity is low yield of maize (the staple as well as major crop of the mountains), largely resulting from scarcity of appropriate varieties. Both the national seed research and extension systems have been ignoring the plight of the predominantly ethnic mountain communities. The farmers' response to food scarcity has been individual, primarily opting towards seasonal or long-term migration in search of off-farm income.

In Tamku, the Rai community has recently started collective action for food security through participatory crop improvement (PCI), where the key to the PCI process is local ownership and

control of the entire initiative. As opposed to centralised formal breeding systems, the farmer-led PCI approach is decentralised. It focuses on capacity building of farmers and local organisations to enable them to determine crop types according to their needs and priorities. It intends to fill the existing gaps through local level seed improvement and quality maintenance, thereby empowering peripheral communities that are perpetually short of maize varieties.

The framework emphasises the systematic identification and assessment of farmers' own systems to prepare relevant technical inputs. Information is gathered on:

- the need for a PCI process
- role and assignments of local NGOs
- cereal crop inventory
- a specific crop for the PCI
- varietal inventory of the PCI
- PCI objectives and varietal assessment

Women's participation in the PCI process is instrumental, as they are the primary managers of seeds. Although the current research centres are situated in one village, the future application of gained insights to other regions would facilitate assimilation of a wide range of maize varietal diversity, thereby supporting agrobiodiversity and in situ conservation of landraces. The current PCI initiative aims at developing a general methodology within the decentralised context, specifying the collaboration between farmers and scientists, while enhancing the household level food security among the mountain farmers who are constantly facing severe resource constraints.

Discussion

There are differences in the perceptions of men and women on quality and yield as parameters of improvement. Women choose quality as more important since they are responsible for maintaining the seed and also provide nutritious food for the family. The choice of crop for improvement was selected in an exercise carried out by the villagers with the facilitation of the project staff and in the presence of the scientists involved in the project. Articulation by women in the participatory planning process is important, but they do not always come forward to share their perspectives.

A common problem in field projects is the lack of continuity of the women staff. This problem seems prevalent in all the countries. Often, men have to be hired to carry out work that necessitates interaction with local women. Thus, it is necessary to orient men in gender sensitive data gathering.

There was a suggestion that the PCI framework could be used in other geographical areas and for other crops.

VI. PAKISTAN

Mr. Zahoor Ahmad and Mr Abdul Ghafoor[2]
Plant Genetic Resources Institute
National Agriculture Research Centre
Islamabad, Pakistan

Abstract

According to the 1998 census, the total population of Pakistan is 130.58 million out of which 62.74 million are female. Approximately 70% of these are living in rural areas and farming is the main occupation of the majority of the people. In agriculture, women, on the whole, contribute significantly to crop production, livestock management, and poultry farming.

Surveys conducted have indicated that rural women play a major role in seed handling, weeding, harvesting, threshing, seed storage, sowing and picking of vegetable crops, management of livestock, and poultry farming. Rural women are involved in biodiversity conservation, made more relevant in exchange situations with their relatives. In rainfed areas it has been found that the degree of participation in farm operations is more where the farmers' income, education, and farm holdings are low. In crop production women share only those activities which are intended to help men but they are more extensively involved in the areas of their specialisation such as weeding, fodder cutting, and grain storage processes. However, these are characterised by simple and old technologies.

[2] In absentia. Paper was received.

VII. THE PHILIPPINES

Dr. Beatriz P. del Rosario
Philippines Council for Agriculture, Forestry, and
Natural Resources Research and Development
The Philippines

Abstract

The National Biodiversity Strategy and Action Plan of the Philippines has as its goals the conservation and sustainable use of biodiversity and the equitable sharing of the benefits of biodiversity.

As the national planning and co-ordinating council for agriculture and forestry, the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD) is tasked to address gender issues and build institutional mechanisms. Along this line, PCARRD spearheads gender advocacy and training, creation of a gender-disaggregated database, creation of a gender core group, and design of programmes/projects integrating gender concerns.

A project which incorporates gender and biodiversity is the Sustainable Agriculture and Natural Resource Management Collaborative Research Programme. It has three components—soil

resource conservation, water resources conservation, and biodiversity conservation and management. One of the projects undertaken was on home gardening and how it enhanced biodiversity conservation and household nutrition. In an effort to augment household food supplies, 88% of the women involved cultivated a wide range of crop species and varieties. Medicinal plants were cultivated by 65% of the women. Most of the women maintain their own planting materials or obtain them from neighbours' collections.

Gender relations play an important role in the conservation of biodiversity, in part because men and women have different roles within the farming household. These roles carry with them different responsibilities in regards to variety selection and maintenance. This is also because men and women have different perceptions of what is happening on the farm. It is not possible to ascertain, at least at this point, who is better able to represent the farming system, even if a simple ranking of the information sources would be desirable. Research has demonstrated that differentiating men's and women's needs/knowledge is important.

Discussion

The Philippines is blessed with rich biodiversity resources. It is also advanced in promoting laws (such as the Material Transfer Act and the Germplasm Acquisition Act) and ensuring the conservation of its biodiversity.

There is a beginning in local community-led seed banks in a few areas of the country. The local gene banks are local farmers' co-operatives, with the method of storage not being technology driven but primitive in nature.

Cultural diversity and diversity in agriculture go hand in hand, in large countries even food habits change from one region to another.

VIII. SRI LANKA

Dr. Anoja Wickramasinghe
University of Peradeniya, Sri Lanka

Abstract

Food security is a complex phenomenon which encompasses the interlinkages between sources of supply and the livelihood context of individuals, households, and communities. As perceived by the people, food security is the availability of food to satisfy multiple food needs to lead an active and healthy life. The linkage between biodiversity management and food security has been evolved as part of the social system; therefore gender provides an analytical framework. Examples drawn from field studies conducted in three areas in Sri Lanka—a traditional irrigation cascade of the dry zone, a mosaic of Kandyan homegardens in the central highlands, and a forest peripheral community living in the southern fringe of the Adam's Peak wilderness—demonstrate such linkages. These three cases reveal the gender specific features in the management of biological diversity for food security at various levels. The first demonstrates the importance of both species and ecosystem diversity or habitat diversity; the second represents community-based innovations in the conservation of biodiversity for household food security; and the third shows the importance of biological resources of forests in ensuring food security.

Analysis reveals that the conventional division of responsibilities between men and women in the food supply system is reinforced in the management of biodiversity. Food habits and practices are influenced by the biophysical and socio-economic context, while men's and women's engagement is determined by socially defined roles and gender relations. From the perspectives of customary practices; proprietary rights to supply sources and biological resources, and food security, the author argues that women should become key stakeholders in conservation and sustainable use of the forests and agro-biodiversity.

Discussion

Seeds are stored in bins made of pandanas fronds and placed above the hearth in the kitchen. There are no community seed storage systems. Each farmer stores his/her own seeds for the next year's crop.

For the 5% of the population who are below the poverty line, there is provision of 90% food subsidies. Most families in Sri Lanka have home gardens of great diversity in vegetables, fruits, flowers, and spices. The produce of home gardens is sufficient to ensure the food security of the family.

Most of the farmers had one or two hectares under tea cultivation and this did not compete with other food crops on the farm.

IX. VIETNAM

Ms. Nguyen Thi Ngoc Hue
Viet Nam Agriculture Science Institute, Viet Nam

Abstract

Vietnam is a country well endowed with biodiversity, and agro-biodiversity in particular. Plant genetic resources (PGR) are considered the most important component of biodiversity. The Vietnamese have long exploited plant genetic resources in crop improvement (source of food security). Nowadays, these valuable resources are essential for the development of modern biotechnology in the country. The food security of the poor and marginal population is directly linked to the availability of food, not only by cultivation but also from sources in and around the immediate common property environment. Food security is the base for enhancing biodiversity conservation and genetic resources.

Agriculture, seedling care, and cattle raising are totally women's activities, other activities are shared between men and women. The role of farmers in maintaining crop diversity has been exemplified by the fifty landraces of rice cultivated in the highlands of Vietnam.

The Government of Vietnam has already paid some attention to biodiversity preservation in general and PGR conservation in particular. The role of women in agricultural production, ensuring food security, and the maintenance of agrobiodiversity has been discussed. Various studies on gender divisions in the livelihood strategies of farming households and the technology used by women have been conducted. Changes are in progress in rural areas that affect gender relations. With the strengthening of the national PGR programmes, the *in situ* conservation of agrobiodiversity projects should be increased to understand gender roles in

biodiversity management. Agriculture and forestry extension is being considered as a good way to help solve gender challenges in agrobiodiversity management.

Discussion

Most often knowledge of medicinal plants resides with women. Community seed banks and community-led conservation efforts are absent in Vietnam. Women themselves maintained seed for the next crop. Research on the specific needs of highland farmers was underway. Gene banks are managed by the government and there is no role here for the community or NGOs.

The need to have a sociologist in the field team was suggested.

5. INNOVATIVE APPROACHES AND FUTURE DIRECTION

Approaches to improve the strategies in each of the three areas namely research, policy, and programme were discussed. Proposals for future directions were put forth. These led to the formulation of the final recommendations of the Consultation.

Research Strategies

- There is a growing realisation that projects and programmes that involve communities and biodiversity conservation need to have special training orientations for the staff, to empower them to deal with communities. In most cases, the personnel working in such projects are science-based persons and have no training in social and gender issues. Scientists need to gain communication skills as well as a basic understanding of community dynamics. Sometimes mentoring is used as a device in community-based programmes.
- Multi disciplinary projects are getting more popular and are seen as being more effective in achieving a holistic goal. There are many scientist leaders in such projects, and there appears to be resistance to lateral linkages among themselves. There is a need to develop a forum for such people to exchange ideas and concerns within the project.
- In many biodiversity conservation projects that are placed in remote areas, the local men come forward with information. Consequently, the observation from women are not evident. The staff of such projects need to understand that women-based knowledge is different and has also to be chronicled.
- The research should not always be top down. Practices based on local knowledge should be given due consideration.
- Projects should be based on a ecosystem and not on a single crop or plant. Holistic projects may be more successful if not limited to a single crop or topic.
- There is a need to identify crops of high nutritional value and of local importance. Production of such crops needs encouragement. This will ensure food security in small yet vital areas.
- In many tribal societies, collection of wild food and medicinal plants make a major contribution to daily food consumption. Projects to revive such wild plants and food habits should be encouraged.
- Studies on gender relations and labour divisions in agriculture or in knowledge systems do not find their application in policies. There should be a forum to educate policy makers on the research findings of such projects to ensure a continuum in the research-policy environment.

Policy Strategies

- The preamble to the Convention on Biodiversity (CBD) recognises women's role in biodiversity management. The Conference of Parties (COP) to the CBD has addressed the issues of sustainable use, conservation, and equitable sharing of biological diversity. Other international bodies such as TRIPS and WIPO are silent on the question of gender rights.
- At national levels, governments, scientific communities, and NGOs are responsible for ensuring that the National Biodiversity Acts, Plant Rights Acts, and Intellectual Property Acts are gender sensitive.

- FAO has an interactive process with national governments and can prepare projects only on their request. FAO has the skills and information to prepare a guideline for gender dimensions in the management of plant genetic resources as well as a gender code for the countries. In many cases, the words `women' and `gender' are synonymous.
- Research has shown that women are primary producers, and yet at policy levels, especially for benefits and incentives, governments target men. Thus women become unpaid contributors to the family's food security. There is an urgency to address women's needs in the spheres of community rights, rewards, and recognition mechanisms. In-depth research has also blown the myth that a household is made of individuals sharing a common interest. There are differences in the power relations within a family, in terms of access to resources and decision making. These differences are also based on the caste, ethnic group, and class of the family.
- Experts in law and policy research are not sensitised to field situations, and women's organisations lack the special skills to deal with national and international agreements and laws. National bodies dealing with women's affairs should set up a small group of experts to integrate gender issues in Biodiversity Acts.
- Delegations that represent a country's interest rarely have a gender expert and so gender issues are not discussed in international agreements. Similarly, national planning bodies and service commissions also need to be sensitised to gender concerns.

Programme Strategies

- In most countries the role of women in agriculture remains invisible. Programmes should attempt to highlight the role of women in the management of natural resources.
- Programmes should start by documenting gender roles and relationships and then move on to action research.
- At times, projects deal with interventions which are not accepted by the communities readily. Strategies to make the interventions successful should also be discussed in the project plans.
- Partnerships between government departments, scientists, and NGOs in the field are essential for the success of programmes.
- It is necessary to have gender-segregated data both for the purpose of research and for policy decisions. There is resistance to the addition of data points in national Census Reports. Enumerators also need to be sensitised to gender issues in their data sheets.
- When programmes are drafted, gender concerns are not given any thought. Many countries and scientists use the concept of gender as an add-on in their programmes. This is not productive to the results of the programme. FAO follows guidelines on inclusion and monitoring of gender in the programmes. Countries should incorporate similar guidelines in their national programmes.
- In some cases (as in polio eradication), women have been the targets of the intervention. But, in agricultural interventions they are sidelined. It would be worthwhile to use women farmers as the agents of change in agricultural interventions also.
- Agriculture has no prestige value. If rural economies are to be revitalised, agriculture has to be seen as an important sector and it should be central in biodiversity conservation projects too.
- Apart from ensuring the production of sufficient food crops, it is also essential to review whether the produce is easily available to all the local communities. Distribution of food to vulnerable regions of the country has to be a priority.

6. RECOMMENDATIONS

The final day of the consultation was devoted to formulating a set of recommendations.

Sustainable biodiversity **management** involves concurrent attention to the following activities:

- Conservation
- Sustainable use
- Equitable sharing of benefits

The legally binding Convention on Biodiversity (CBD) provides guidelines in all these three areas. Further, CBD recognises “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.”

The participants of this FAO-MSSRF Regional Technical Consultation considered methods of mainstreaming gender considerations in biodiversity management through the case studies and country papers presented and the detailed discussions that followed. Based on these, recommendations for implementation at the global, regional, and national levels were made.

Global Action

FAO

FAO, through its Commission on Genetic Resources for Food and Agriculture, should develop a **Gender Code** to facilitate the recognition of women's role in the conservation and enhancement of agro-biodiversity. Such a Gender Code may also provide for the incorporation of gender-sensitive provisions in the operational framework for **Farmers' Rights** as well as for the revitalisation of the traditional contributions of women in the conservation and selection of valuable genetic diversity in home gardens.

FAO's *The State of Food and Agriculture Report* for the year 2001 should include a special chapter on “**Strengthening Gender Roles in the Conservation and Enhancement of Agro-biodiversity.**”

WTO-TRIPS

The Seattle round of discussions on the Trade-related Intellectual Property Rights should take into account gender roles in bioresources management.

The World Intellectual Property Rights Organisation (WIPO)

WIPO is currently engaged in a study relating to the recognition of contributions of indigenous, tribal, and rural communities in the conservation and improvement of biological resources. This study should give explicit consideration to the role of women as holders of traditional knowledge and conservers of genetic resources.

Conference of Parties to CBD (COP)

At one of the forthcoming meetings of the COP, specific attention should be paid to methods of recognising and rewarding the contributions of women, as stipulated in CBD.

It is requested that the FAO Regional Office in Bangkok and MSSRF take up these recommendations with the concerned authorities for implementation.

Regional Co-operation

Asian Network on Gender, Biodiversity and Food Security

A co-operative network linking concerned institutions and individuals in Asia into a working partnership will be very valuable in achieving the goal of internalising the gender dimension in ongoing work relating to biodiversity management. Such a co-operative network can undertake the following tasks in a sustained and systematic manner:

- exchanging and sharing of information
- preparing data bases on (a) literature, (b) institutions engaged in gender research, and (c) individuals carrying out gender analysis
- sponsoring country studies
- organising Travelling Seminars to learn from one another
- publishing an electronic newsletter through a designated web site
- establishing linkages with related networks of CGIAR institutions such as the Women in Rice Farming Network of IRRI

FAO-RAP should initiate steps to bring such a network into existence, and MSSRF may serve as its co-ordinating centre. National nodes will have to be designated and suitable funding agencies will have to be identified to initiate and sustain the network.

Country-specific case studies

FAO-RAP is to be congratulated on its initiative in sponsoring country-specific case studies. This initiative needs to be continued and case studies initiated in Bangladesh, the Philippines, Vietnam, and Thailand.

National Action

Every country should develop a **national gender code** (which includes land ownership rights for women) for implementation under the National Biodiversity Act.

Legislation relating to Plant Variety Protection and Farmers' Rights should be gender sensitive. The Act should provide for the inclusion of representative of women farmers and conservers on the appropriate national regulatory and co-ordinating bodies.

Policy advocacy seminars should be organised, where the results obtained in case studies can be brought to the attention of policy makers.

Government departments dealing with forestry and environment should give adequate representation to women professionals.

The 2001 Census could incorporate the gender dimension while collecting statistics in the fields of food, agriculture, and land rights.

In Participatory Forest Management systems involving local communities, the participation of women and the sharing of non-wood forest products with them should be ensured.

Community Biodiversity Registers must be gender sensitive. The format developed by MSSRF serves as a model for gender-sensitive Community Biodiversity Registers.

The passport data maintained by **gene banks** should be recast, in order to clearly bring out gender roles in the conservation and collection of different accessions.

MSSRF is requested to undertake mapping gender dimensions of biodiversity **management** through a survey of published literature.

The provisions of National Biodiversity Acts and the implementation structures established under such Acts, should ensure that the role of women is properly recognised in prior **informed consent, access, and benefit sharing**.

Countries like Bangladesh and the Philippines have made considerable progress in engendering all development and conservation programmes. There is much that other countries in this region can learn from the experience of Bangladesh and the Philippines in implementing the provisions of national legislation designed to empower women and to remove gender blindness. This will help to alter the present deplorable situation, where the critical role of women in biodiversity management and in food security remains invisible and unrecognised.

Nearly 900 million of the world's poor (i.e., who survive on less than one US dollar a day) live in the Asia-Pacific region. Nearly one in three Asians are poor. A majority of them are women. Poverty has become the primary cause of food insecurity at the levels of individuals and households. The sufficient and equitable use of biodiversity can help in enhancing the income and livelihood security of the poor. This is why the recommendations of this consultation on methods of mainstreaming gender considerations in biodiversity management deserve urgent attention and appropriate action.

ANNEXES

Annex 1

Regional Technical Consultation on
Gender Dimensions in Biodiversity Management and Food Security: Policy and Programme Strategies for Asia

PROGRAMME

Tuesday, 2 November 1999

INAUGURAL SESSION

9:30 a.m. - 10:30 a.m. *Welcome*

Revathi Balakrishnan
Regional Sociologist and WID Officer,
FAO Regional Office for Asia and Pacific, Bangkok

Opening Statement
Mr. Peter Rosenegger
FAO Representative in India and Bhutan

Inaugural Address
Hon'ble Begum Matia Choudhury
Minister for Agriculture & Food, Government of Bangladesh

Presidential Address
Dr. M.S. Swaminathan, *Chairman, MSSRF*

Vote of Thanks
Ms. Mina Swaminathan
Hon. Director, Uttara Devi Resource Centre for Gender and Development, MSSRF

TECHNICAL SESSIONS

Technical Session I

11:00 a.m. - 12:45 p.m. **Gender Dimensions of Biodiversity Management: Overview and Synthesis**
Chair: Dr. Anoja Wickramasinghe

Gender Defined Strategies for Biodiversity Management for Household Food Security

Revathi Balakrishnan

Involving Women, Ignoring Gender

Ms. Sumi Krishna, India

IDRC's Approach to Research in Gender and Biodiversity Management

Ms. Elizabeth Fajber

Programme Officer, IDRC, New Delhi

Technical Session II

2:00 p.m. - 4:00 p.m. **Situation in Nepal, Bhutan, and Bangladesh**

Chair: Ms. Sumi Krishna

Methodological Framework in Enhancing Food Security in a Mountain Ethnic Community

Mr. Prem Gurung *ICIMOD, Nepal*

Gender Dimension in Biodiversity Management and Food Security in Bhutan

Ms. Cheki Wangmo

National Biodiversity Program, Bhutan

Keynote Paper: Bangladesh

Hon'ble Prof. Zinatun Nesa Talukder

Minister of State for Children and Women's Affairs, Bangladesh

Wednesday, 3 November 1999

Technical Session III

9:00 a.m. - 12:30 p.m. **Situation in India and Pakistan**

Chair: Professor M.S. Swaminathan

Technical Session 1 and 2 - Recapitulations

Dr. Anoja Wickramasinghe, Ms. Sumi Krishna

India: Gender and Biodiversity Management

Dr. Hemal S. Kanvinde, *MSSRF, Chennai*

Linkages between Biodiversity and Biotechnologies

Dr. Sudha Nair, *MSSRF, Chennai*

Internalisation of Gender Concepts

Ms. Mina Swaminathan, *MSSRF, Chennai*

Gender Dimensions in Biodiversity Management in Pakistan

Dr. Zahoor Ahmed and Dr. Abdul Ghafoor

PGRI, Pakistan

Technical Session IV

2:00 p.m. - 3:00 p.m. **Situation in Sri Lanka and Maldives**

Chair: Ms. Cheki Wangmo

The Local Context and Gendered Sights Related to Biodiversity Management and Food Security in Sri Lanka

Dr. Anoja Wickramasinghe, *University of Peradiniya, Sri Lanka*

Biodiversity and Management in Maldives

Dr. Mohamed Naseem, *Ministry of Fisheries & Agriculture, Maldives*

Thursday, 4 November 1999

Technical Session V

9:00 a.m. - 11:00 a.m. **Situation in Philippines and Vietnam**

Chair: Dr. Mohamed Naseem

Gender Roles on Agrobiodiversity Management in Vietnam

Ms. Nguyen Thi Ngoc Hue PGRC, *VASI, Vietnam*

Gender Dimension in Biodiversity Management and Food Security: The Philippine Experience

Dr. Beatriz P. del Rosario, *PCARRD, Philippines*

Technical Session VI **Innovative Approaches and Future Direction**

11:30 a.m. - 5:00 p.m. *Research Strategies*

Chair: **Dr. Beatriz P. del Rosario**

Research Framework FAO Links

Inputs from NBPGR, India: **Dr. K. Srinivasan, Dr. V. Joshi**

Inputs from ICRISAT: **Dr. V. Mahalakshmi**

Policy Strategies

Chair: Dr. M.S. Swaminathan

Program Strategies

Chair: **Mr. Prem Gurung**

Friday, 5 November 1999

Technical Session VII

9:00 a.m. - 5:00 p.m. **Gender Dimensions of Biodiversity Management in Relation to Food Security**

Strategic and Practical Gender Needs

Chair: **Revathi Balakrishnan**

Finalisation of Recommendations based on Session VI

Moderator: **Dr. Nilofer Karim**

Closing Session

An Agenda for Action

Chair: **Dr. M.S. Swaminathan**

2:00 p.m. - 5:00 p.m. **Media Workshop: Media, Gender, Biodiversity, and Food Security**

Moderator: **Ms. Nirmala Lakshman,** *Editor, The Sunday Hindu*

Annex 2.
List of Participants

BANGLADESH

Hon'ble Begum Matia Choudhury
Minister for Agriculture and Food

Hon'ble Begum Zinatun Nesa Takulder
State Minister for Women and Children Affairs,

Mr. Jamshed Ahmed Khondoker
Asst. Private Secretary - Hon'ble Minister Bangladesh Secretariat
Government of the Peoples Republic of Bangladesh, Dhaka
Tel. : 880-2-8692/7
Fax : 880-2-869227 / 862240
Email : secmadhk@citechco.net

Dr. Nilufer Hye Karim
Chief Bio-Technologist
Bangladesh Rice Research Institute
Gaziapur - 1701, Bangladesh
Email : brrihq@bdonline.com

BHUTAN

Ms. Cheki Wangmo
Project Assistant (Agro-biodiversity Section)
National Biodiversity Programme
Ministry of Agriculture
Royal Government of Bhutan
Serbithang, Bhutan
Tele./Fax: 975-3-23872
Email : Ppd-moa@druknet.net.bt

INDIA

Ms. Sumi Krishna
C-4, Neelamber Apartments
Opp Sainik Vihar
New Delhi, India
Tel. : 91-011-702 2916
Email : Sumi_krishna@hotmail.com

MALDIVES

Mr. Mohamed Naseem
Senior Agriculture Officer
Ministry of Fisheries and Agriculture
Government of Maldives
Ghazee Building
Male', Republic of Maldives
Tel. : 960-310063 / 322625
Fax : 960-326558
Email : fishagri@dhivehinet.net.mv

NEPAL

Mr. Prem Gurung
International Centre for Integrated Mountain Development
4/80 Jawakhel, GPO Box 3226
Katmandu, Nepal
Tel. : 977-1-525313
Fax : 977-1-524509 / 536747
Email : Janet@icimod.org.np
astrid@icimod.org.np

PHILIPPINES

Dr. Beatriz P. del Rosario
Officer-in-Charge, PCARRD
(Philippines Council for Agriculture and Natural Resources Development)
Los Banos, Laguna, Philippines
Tel. : 63-49-536 0014 0020
Fax : 63-49-536 0016
Email : bpr@ultra.pcarrd.dost.gov.ph

SRI LANKA

Prof. Anoja Wickramasinghe
Department of Geography
University of Peradiniya, Peradeyniya, Sri Lanka
Tel. : 94-08-374536
Fax : 94 8 232517
Email : niluwick@slt.lk

VIETNAM

Ms. Nguyen Thi Ngoc Hue
Deputy Head Plant
Genetic Resources
Vietnam Agriculture Science Institute
Vandien, Thanhri
Hanoi, Vietnam
Tel. : 84-4-861 4326
Fax : 84-4-861 4937
Email : nghia@vasi.ac.vn

FAO

Revathi Balakrishnan
Regional Rural Sociologist and Women in Development Officer
FAO Regional Office for Asia and the Pacific
39 Phra Atit Road
Bangkok 10200
Thailand
Tel. : 662-281 7844 Extn.148
Fax : 662-280 0445
Email : Revathi.Balakrishnan@fao.org

Mr. Peter Rosenegger
Representative in India and Bhutan
Food and Agriculture Organisation of the United Nations
PO Box 3088
55 Max Mueller Marg
New Delhi 110 003
Tel. : 011-462 8877 / 469 3060
Fax : 91-011 462 115
Email : FAO-IND@fao.field.org

ICRISAT

Dr. V. Mahalakshmi
International Crops Research
Institute for Semi Arid Tropics
Patancheru 502 324
Andhra Pradesh
Tel. : 91-40-596161
Fax : 91-40-241239
Email : Icrisat@cgnet.com

IDRC

Ms. Elizabeth Fajber
Regional Program Officer
IDRC-South Asia Regional Office
17 Jorbagh, New Delhi 110 003
Tel. : 011-461 9411

Fax : 011-462 2707
Email : Efajber@idrc.org.in

NBPGR

Dr. Vandana Joshi
Under Utilised Crops Division

Dr. Kalyani Srinivasan
Germplasm Conservation Division
National Bureau of Plant Genetic Resources,
Pusa Campus
New Delhi 110 012
Tel. : 011-578 9208, 9211, 9214
Fax : 91-011-573 1495, 578 5619
Email : nbpgr@x400.nicgw.nic.in

UNDP

Ms. Kalyani Menon Sen, Consultant
Mr. Sudarshan Rodriguez, Consultant
United Nations Development Programme
55, Lodi Estate, Post Bag No 3059
New Delhi 110 003
Tel. : 011-462 8877
Fax : 91-011-462 7612
Email : Fo.ind@undp.org

MSSRF

Dr. M.S. Swaminathan
Ms. Mina Swaminathan
Dr. Hemal S. Kanvinde
M.S. Swaminathan Research Foundation
3rd Cross Road
Taramani Institutional Area
Chennai 600 113, India
Tel. : 044-235 0698/235 1698
Fax : 091-044-235 1319
Email : general@mssrf.org

MSSRF Field Office

Mr. G. Girigan
M.S. Swaminathan Research Foundation
Community Agrobiodiversity Centre
Chandra Bhavanam
Puthoor Vayal Post
Kalpetta, Wayanad - 673 121, Kerala

Tel. : 0493-604477
Fax : 91-0493-602094

Mr. Saujanendra Swain
M.S. Swaminathan Research Foundation
Site Office: Lingaraj Nagar
Jeypore - 764 004
Koraput District
Orissa
Tel. : 06854-30350 (O) 31912 (R)
Fax : 91-06854-23151
Email : saujanendra@rediffmail.com