



Biodiversity Conservation and Livelihoods

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India is ranked as one of the 12 mega-diversity-rich countries of the world and is a signatory to the Convention on Biological Diversity (CBD). Public policy for conservation of this immense biodiversity heritage is expressed in two ways: on-site (*In situ*) conservation and pursued through National Parks, Protected Areas, Biosphere Reserves and World Heritage Sites and off-site (*Ex situ*) conservation pursued through Sacred Groves, Botanical and Zoological Gardens and Gene Banks. In the domain of *in-situ* conservation, on-farm conservation by rural and tribal women and men has remained largely unrecognized and unrewarded. These communities continue to possess the traditional knowledge to cultivate, use and preserve a large number of land races and folk varieties of crop plants and animal breeds. These practices, which are of great value to sustainable food and nutrition security, have so far been sustained without any benefit or reward.

The direct economic benefits of biodiversity run into trillions of dollars per year. Some of the significant benefits include crop production which is completely dependent on insect pollinators, biological pest control and biological nitrogen fixation that saves a lot of revenue. While recognition of the values of the goods and services that biodiversity offers - both direct and indirect - is increasing, the relationship between the role of biodiversity in environmental sustainability, poverty reduction, livelihood and sustainable development needs further attention and understanding.

Biodiversity, a contraction of “biological diversity” covers a number of concepts. Diversity is a concept which refers to the range of variation or differences among some set of entities. Biological diversity thus refers to the variety within the living

world, and includes all living organisms both individuals and their relationship with one another. It is not just a collection of individuals but an interaction system where the characteristics of individuals are no less important than their functions. It is used to describe the huge variety of life on this planet.

On-farm conservation of biodiversity

The on-farm conservation of biodiversity is particularly important for a diversity-rich country like India. Small and poor farmers in India generally practice low-input farming and are dependent on, in addition to crop plants, wild and semi-wild species for food and other needs. For the conservation of diversity in these species, farmers and communities need to be targeted, particularly in diversity-rich areas. However, the task of on-farm conservation is huge and complex; and its benefits are to be accrued nationally. It needs to be taken up on a wider plane in a national network mode. This network could be difficult to operate, as it needs contribution of various diverse partners at different levels and has to be operated in an integrated manner. Also, it needs support in terms of government policy, incentives, local marketing network and also value addition, besides community awareness.

Convention on biological diversity

One of the landmark outcomes of the 1992 Earth Summit was the adoption of the Convention on Biological Diversity (CBD), which has so far been ratified by 189 countries. The CBD focuses on conservation of biodiversity, sustainable use, and fair and equitable sharing of benefits arising out of the use of biodiversity. The CBD is one of the most



important international conventions and is implemented widely and in many cases effectively. A significant element of CBD is the underpinning it provides for sustainable development through biodiversity conservation.

Biodiversity and poverty alleviation

Since biodiversity impacts issues of poverty, a focus on using biodiversity equitably and sustainably is fundamental to strategies and actions to eradicate/reduce poverty and to achieve sustainable development. Rural households derive a significant proportion of their food and income from biological resources and, therefore, the availability and sustainability of biological resources is of direct relevance to poverty reduction for these people. Additionally, a large proportion of poor people live in marginal environments and in areas with low agricultural productivity or in fragile lands. In these environments, there is a high dependency on genetic, species and ecosystem diversity to support their livelihoods. That is why, aspects of biodiversity are of direct and indirect importance to food availability, health, nutrition, house-hold development, income generation and vulnerability.

Biodiversity and food security

There can be no global food security without biodiversity. This is why the Food and Agriculture Organization of the United Nations (FAO), an intergovernmental organization, has been actively promoting the conservation and sustainable use of biodiversity for food and agriculture for more than three decades. FAO's goal is to alleviate poverty and hunger by promoting sustainable agricultural development, improved nutrition, enhanced food security, and access to all people at all time the food they need for an active and healthy life.

Biodiversity and sustainable development

Broadly, the following may be considered as ways to integrate issues of sustainable development and biodiversity:

1. Improving poor peoples' access to, and tenure of, biodiversity resources.

2. Involving the poor in decision and policy making.
3. Providing market linkages and sustainable use practices.
4. Investing in research and development on how to improve rural incomes and
5. Developing mechanisms to continue or enhance public interest in biodiversity - maintaining products and services.

Some of the more specific actions and interventions to achieve sustainable development, while ensuring the sustainable use of biodiversity include:

- ◆ Achieve population control targets by raising awareness, empowerment, education and equity through development and implementation of appropriate policies - thus reducing the pressure on biodiversity.
- ◆ Achieve minimum nutritional standards of people by: promoting cultivation of nutritional crops, drought-resistant varieties; setting up community seed banks; provision of access to nutritional food; raising awareness on removing hidden and transient hunger.
- ◆ Develop income generation opportunities through sustainable livelihoods using Public-Private Sector Partnerships with supporting policies and investments at local levels.
- ◆ Promote access and benefit sharing activities *i.e.* benefits of conservation efforts should be targeted to the poor stakeholders by supporting activities on *ex-situ* cultivation, legislations on sharing of benefits including the mechanisms for enforcement; and raising awareness.
- ◆ Understand the economic values of biodiversity and empower local communities on achieving economic gains by developing suitable market linkages and strategies.
- ◆ Promote sustainable agricultural practices by: providing incentives to farmers for following sustainable practices; supporting use of modern and traditional technology blends.
- ◆ Raise the awareness of communities on



values of biodiversity by: assessing the economic value of biodiversity; raising awareness; building capacities of communities; identifying and supporting elements of biodiversity that impact livelihoods.

Biodiversity and health

Biodiversity plays a crucial role not only in providing medicines to deal with issues of health and nutrition, but ecosystems play a significant role in dealing with diseases like malaria and others. In the CBD, the general principle of conservation and sustainable use of biological diversity is the focus for national action on using biodiversity to reduce the impacts of poor health on humans and ecosystems. Issues of ecosystem disturbance and related health impacts are receiving much attention.

A significant proportion of drugs are derived directly or indirectly from biological sources. Medicinal drugs derived from natural sources make an important global contribution to health care. An estimated 80% of people in less developed countries rely on traditional medicine for primary health care. Some 120 chemicals extracted in pure form from around 90 species of plants are used in medicines throughout the world. Many of these natural chemical cannot be manufactured synthetically. Neem (*Azadirachta indica*) products have valuable medical properties and traditional uses as medicines and diabetic food. The leaves, fruits and oil of the Neem plant is used to cure many ailments like acne, scabies, eczema and other fungal infections. Some other notable medicinal plants include lemon grass (*Cymbopogon citrallus*), sweet basil (*Cocimum gratissimum*), garlic (*Allum sativa*), ginger (*Zingiber officinale*), bitter leaf (*Vernonia amygdaline*), black pepper (*Gongronema latifolium*). Their versatility in preparation of traditional medicine for young children, confined mothers and aged people are well known.

Biodiversity and conservation agriculture

Conservation agriculture maintains a permanent or semi permanent organic cover on the soil comprising either a growing crop or dead organic matter. The function is to protect the soil from action of sun, rain and wind and to feed soil biota. Decomposition of the additional organic matter by the

soil micro flora will stimulate the activities and diversity of the micro flora, resulting in increased stabilization of the dead organic matter in the form of humid substances. This will help to improve the soil structure and reduce soil erosion. Conservation and protection against deforestation for example through the expansion of protected areas and improved fire control reduce losses of biodiversity. Improved forest management through reduced impact logging to increase sequestration and reduction in emission also help to reduce losses of biodiversity.

Participatory biodiversity management (PBM)

Community Based Organisations (CBOs) of primary stakeholders are at the centre of planning, budgeting, implementation and management of all participatory biodiversity management programme. The programme design provides adequate time for capacity building of CBOs. Functioning as an empowered organisation, a CBO proves its sense of ownership of the programme by sharing the cost of the investment which is being made for its benefit. These autonomous institutions should have required human resources with necessary professional skills and capacities. A governing board, constituted with strong representation from stakeholders and multidisciplinary professionals with high levels of competence, can provide support to the CEO for effective decision-making. Rural Communities require the support of facilitating agencies, preferably competent NGOs, which have necessary skills and expertise, would be selected through a rigorous and transparent process. The facilitating agencies should have a multi-disciplinary professional team supported through adequate financial resources.

The overall objective of the programme should have to strengthen and mainstream on-farm management of genetic resources through participatory action research with farmers and capacity building activities with a focus on market development, and to provide policy advice in the international debate on farmers' rights. Market development is regarded as a crucial component of on-farm management of biodiversity in order to contribute to the livelihoods of local communities and the sustainability of local efforts in biodiversity management.