Rendiconti
Accademia Nazionale delle Scienze detta dei XL
Memorie di Scienze Fisiche e Naturali
127° (2009), Vol. XXXIII, P. II, t. I, pp. 287-291

M.S. Swaminathan Research Foundation

International Year of Biodiversity

International Conference on

"Biodiversity in Relation to Food and Human Security in a Warming Planet"

Launching a Climate cum Gene Care Movement

Chennai Declaration

A. Background:

Demographic explosion, environment pollution, habitat destruction, enlarging ecological footprint, co-existence of widespread hunger and unsustainable life styles, and potential adverse changes in climate all threaten the future of human food, water, health and livelihood security systems. 2010 appears to mark the beginning of uncertain weather patterns and extreme climate behaviour. Events like temperature rise, drought, flood, coastal storms and rise in sea level are likely to present new challenges to the public, professionals and policy makers. Biodiversity has so far served as the feedstock for sustainable food and health security and can play a similar role in the development of climate resilient farming and livelihood systems. Biodiversity is also the feedstock for the biotechnology industry. Unfortunately, genetic erosion and species extinction are now occurring at an accelerated pace due to habitat destruction, alien species invasion and spread of agricultural systems characterized by genetic homogeneity. Genetic homogeneity enhances genetic vulnerability to biotic and abiotic stresses. To generate widespread interest in biodiversity conservation, the UN General Assembly has declared 2010 as the International Year of Biodiversity.

The Global Convention on Biodiversity (CBD) adopted at the UN Conference on Environment and Development held at Rio de Janeiro in 2002, and the International Treaty on Plant Genetic Resources for Food and Agriculture adopted by Member Nations of FAO in 2001 provide a road map for the conservation and sustainable and equitable use of biodiversity. CBD emphasises that biodiversity occurring within a Nation is the sovereign property of its people. Hence, the primary responsibility for conserving biodiversity, using it sustainably and equitably and preserving it for posterity rests with each Nation. This implies that all Nations should subject development programmes to a **Biodiversity Impact Analysis** in order to ensure that economic advance is not linked to biodiversity loss. Inter-generational equity demands that we must preserve for posterity at least a representative sample of the biodiversity existing in our planet today.

Initiatives like the recognition of Globally Important Agricultural Heritage Sites of FAO and the World Heritage Sites of UNESCO are important to generate interest in the conservation and enrichment of unique biodiversity sites. Particular attention will have to be given to protecting the protected areas through public education and social mobilization, in addition to appropriate regulation. Unfortunately, many of the protected areas, National Parks and Biosphere Reserves are facing serious anthropogenic pressures. Based on the model of the Biosphere Trust for the conservation of the Gulf of Mannar Biosphere Reserve in India developed by MSSRF, Biosphere Reserves could be jointly managed by local communities and Government departments. The concept of participatory forest management should be extended to national parks and biosphere reserves.

Special attention should be paid to biodiversity hotspots. Through public cooperation, they should be converted into biodiversity "happy spots", where the sustainable use of biodiversity helps to generate new jobs and income. Coastal biodiversity has not received adequate attention. Mangrove wetlands are under various degrees of degradation. The Joint Mangrove Forest Management procedure developed by MSSRF should be implemented wherever mangrove genetic resources still occur.

Biodiversity conservation and sustainable management should become a national ethic. Government agencies including local self-government authorities like **Panchayats** in India could play an important role in both spreading biodiversity literacy through Community Biodiversity Registers and by creating the necessary infrastructure like Gene and Seed Banks. Awareness of the relationship between biodiversity and human health and farm animal survival should become widespread.

Women play a lead role in biodiversity conservation and sustainable use. Mainstreaming of the gender dimension in all conservation and food security programmes is a must. Women conservers should be enabled to continue their conservation ethos, by providing support for essential infrastructure. Agro-biodiversity is the result of interaction between cultural diversity and biodiversity. An important aspect of cultural diversity is culinary diversity. Every step should be taken to recognize and preserve cultural diversity and to blend traditional wisdom with modern science.

Biodiversity is the feedstock not only for food and health security, but also for the management of climate change induced alterations in temperature, precipitation and sea level. Gene banks for a warming planet have become urgent for promoting climate resilient farming systems. We must preserve for posterity a sample of the existing genetic variability in all ecosystems. The prospects for climate change have added urgency to efforts designed to save every gene and species now existing in our Planet.

The role of farmers and farming in the mitigation of climate change has not so far been adequately recognized and appreciated. Farmers can help build soil carbon banks and at the same time improve soil fertility through Fertilizer trees. Mangrove forests are very efficient in carbon sequestration. Biogas plants can help

to convert methane emissions into energy for the household. Hence, a movement should be started at the global, national and local levels for enabling all farmers with small holdings and a few farm animals to develop a water harvesting pond, plant a few fertilizer trees and establish a biogas plant, in every farm. A farm pond, few fertilizer trees and a biogas plant will make every small farm contribute to climate change mitigation, soil health enhancement and water for a crop life saving irrigation.

B. Plan of Action:

To achieve the goals of biodiversity conservation and use in an era of climate change, we recommend the following:

Recommendation 1: Deliver as One:

Recognize in national development plans (including poverty reduction programmes) the importance of the use and conservation of biodiversity in agro-ecosystems. This necessitates integration of approaches across government departments confronting rural development, food security, poverty reduction, environment and climate change. To the extent feasible the "**deliver as one**" approach should be adopted, in order to achieve convergence and synergy among different ongoing programmes.

Recommendation 2: Building Partnerships

Effective use of agro-biodiversity is the key to realizing its development impact and its conservation. This requires development of markets for products of diverse agriculture, especially underutilized crops, different animal genetic breeds etc. This can be built on public-private partnerships and development of agribusinesses benefiting rural communities.

Recommendation 3: Strengthen the Role of Farming and Tribal Communities

Farming and tribal communities have a major role in delivering the benefits of agro-biodiversity including:

– **Incorporate community *in situ* and *ex situ* conservation** in the national biodiversity conservation strategy. *In situ* conservation will start from the field. *Ex situ* conservation can take the form of sacred groves and heritage trees, as well as botanical and zoological gardens.

– **Organise field gene banks, seed banks and grain banks** at the local level. This will help to promote *in situ* on farm conservation of land races, enlarge the food basket and thereby strengthen local level crop and food security.

– Establish special Gene Banks for **climate resilient crops**.

– Recognise and reward primary conservers of biodiversity through initiatives

like the **Genome Saviour Award** instituted by the Plant Variety Protection and Farmers Rights Authority of India.

– Pay particular attention to protecting the protected areas through public education and social mobilization, in addition to appropriate regulation. Based on the model of the Biosphere Trust for the conservation of the Gulf of Mannar Biosphere Reserve in India developed by MSSRF. Biosphere Reserves could be jointly managed by local communities and Government departments. Special attention should be paid to biodiversity hotspots.

– Initiatives like the recognition of Globally Important Agricultural Heritage Sites of FAO and the World Heritage Sites of UNESCO are important to generate interest in the conservation and enrichment of unique biodiversity sites.

Recommendation 4: Conservation Science

Refocus the R & D priorities to enhance the productivity of bio-diverse agriculture including the need to optimize genetic diversity (plants and animals). For example, characterize, evaluate and utilize landraces and wild crop relatives in crop improvement programmes to transfer traits relevant to climate change, eg. Drought and Heat Resistance and flood and salinity tolerance. Breeding for per-day yield rather than per-crop productivity should receive priority. These priorities should be reflected in higher education curricula and research agenda.

Recommendation 5: Climate Resilient Farming Systems

Climate change will demand modifications to farming systems (eg., cultivars, land use, water use management, animal selection) and increased environmental risk management. This will require prioritization of the social and agro-ecological zones most at risk. Biodiversity is the feedstock not only for food and health security, but also for the management of climate change. Gene banks for a warming planet have become urgent as an essential element of climate resilient farming systems. The prospects for climate change have added urgency to efforts designed to save every gene and species now existing in our Planet. The initiative of the Government of Norway in establishing a Global Seed Vault at Svalbard, and of the Defence Research and Development Organisation of the Government of India in establishing a similar facility under perma- frost conditions at Chang La in the Himalayas are welcome steps.

Recommendation 6: Land Use Patterns

The role of farmers and farming in the mitigation of climate change has not so far been adequately recognized and appreciated. Since land-use represents a third of global greenhouse gas emissions, this must be reversed. Farmers can help build soil carbon reserves and at the same time improve soil fertility through Fertilizer trees and conservation agriculture. Mangrove forests are very efficient in carbon sequestration.

Recommendation 7: Economic Value of Ecosystem Services

Accord **economic value to ecosystem services** like land, water, biodiversity and climate and put in place mechanisms for payment for such services; this will help to reduce ecological footprint and thereby help to achieve a balance between bio-capacity and natural resources exploitation.

Recommendation 8: Biodiversity Literacy

Launch an extensive and well designed **biodiversity awareness and literacy campaign** starting with school children and extending up to the adult population. Such a biodiversity literacy programme should involve the integrated use of traditional and new media. Village Knowledge Centres could be utilized for sensitizing the local population on the threats to biodiversity and the names and locations of the rare, endangered and threatened (RET) species occurring in that area. University students and civil society organizations can be assisted in saving RET species. The preparation of local level Biodiversity Registers can be promoted.

Recommendation 9: Climate Care Movement

Launch a **Climate Care Movement** at the local, national and global levels with specific attention to the following:

– Gene Care and Conservation
– Climate Literacy
– Community Gene, Seed, Grain and Water Banks
– A Water Harvesting Pond, a few fertilizer trees and a Biogas plant in every small farm
– Community Climate Risk Managers
– Promote appropriate mitigation and adaptation measures

We hope that the plan of action outlined in the Chennai Declaration will help to launch a new era of bio-happiness arising from the conservation and sustainable and equitable use of biodiversity. The greatest casualty of climate change will be food and water security. Biodiversity helps to mitigate the adverse impact of climate change. The declaration of 2010 as the International Year of Biodiversity is therefore a timely global initiative.