NATIONAL ACTION PLAN FOR AGROBIODIVERSITY CONSERVATION AND SUSTAINABLE UTILIZATION IN SRI LANKA

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by

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INTRODUCTION

1. Agrobiodiversity primarily refers to the sustainable and productive use of genetic resource in crops and livestock, and their progenitors and wild relatives, and for agricultural development. It has a wide coverage in terms of genetic resource utilization and provision of ecological services. Apart from crop and livestock genetic resources, its resource base extends to aquatic life, avi-fauna, insects, microbes and soil based microbiological species, as well as to wild species.

2. Agrobiodiversity is a component or a sub set of biodiversity resulting mainly from the interactions of humans and the natural resources and the systems for the purpose of agricultural production to provide food and nutrition, medicine, livelihood and habitat conservation. From the earliest days of domestication of plants for human use about 12,000 years ago, agrobiodiversity has played a pivotal role in sustaining and strengthening food, nutrition, health and livelihood securities all over the world. It is well accepted that endemic hunger caused by protein-energy malnutrition, hidden hunger caused by deficiencies of iron, iodine, zinc vitamin A and other micronutrients in the diet, and transient hunger caused by droughts, floods, and other natural disasters can be overcome only through an integrated strategy for the conservation and sustainable and equitable use of agrobiodiversity. Agrobiodiversity also provides uncommon opportunities for developing decentralized and location specific community food security systems involving field gene banks, seed banks and grain banks developed and managed by local people. Agrobiodiversity further helps to enlarge the food security by including nutrient rich but underutilized crops and animals. Agrobiodiversity also offers the crucial raw material for improving in perpetuity the productivity and quality of crops, livestock and fish. Agrobiodiversity also offers for entrepreneurial initiatives, which will generate employment and income from a range of value added food products, medicines, nutraceuticals and other products. The potential of agobiodiversity for coping with climate change is not well appreciated. The flagship role played by agrobiodiversity in overcoming food security is yet to be widely realized and integrated with national planning. Agrobiodiversity and cultural diversity have feedback relationships. Local farming systems provide the

feedstock for poems, songs, dance and drama. Thus, agrobiodiversity confers multiple benefits-ecological, economic, nutritional and cultural.

3. Although agrobiodiversity is linked to many of the themes presented in the Biodiversity Conservation Framework Action Plan (BDFAP) Addendem (2007), there are issues which are quite specific to agrobiodiversity. These include the positive and negative impacts of agricultural practices on biological diversity in agroecosystems, and their interaction with other ecosystems; the conservation and sustainable utilization of genetic resources including crop wild relatives for their potential value in food and agriculture; and the fair and equitable sharing of benefits arising out of the utilization of such genetic resources.

GAPS AND ISSUES

4. The Biodiversity Conservation Framework Action Plan (BDFAP) (1998), has in general terms taken up issues of conservation of agrobiodiversity under objectives and recommendations in "Agricultural Systems", but has failed to make specific references to on-farm loss of genetic diversity and strategies for conservation. According to BDFAP Addendum (2007), the policy issues and gaps in conservation and utilization of agrobiodiversity, are summarized below.

i. Absence of any references to policies and strategies for on-farm conservation of genetic diversity including indigenous crop and livestock, and lack of policy on effective *sui generis and farmer's rights* to recognize and reward farming communities for their knowledge and innovations.
ii. Inadequate stress on the need for a quarantine policy for the import and export of seeds and breeding material, and other biological materials.
iii. Limited research emphasis and incentives for conservation and sustainable use of native lesser known and underutilized crops, landraces and indigenous faunal species, pollinators and soil microorganisms as well as ethno-biological aspects of agricultural biodiversity (agro-ethno botany, medical-ethno botany).
iv. Absence of a focus on market support and price policy for products from indigenous crops and livestock to encourage conservation of native species.
v. Absence of a concern for informal seed supply of traditional varieties to support livelihood of farming communities. Present legal regime favors certification and quality control of modern varieties at the expense of native lesser known crops and local landraces.
vi. Absence of policy and advocacy to integrate traditional agrobiodiversity conservation methodologies into the formal education system, which is presently geared only towards modern methods.
vii. The importance of credit, crop insurance and other policy incentives for traditional on-farm conservation of agriculture, has not been highlighted.
viii. The need to promote diverse traditional culinary foods as a source of better nutrition and as an incentive to conserve agro-biodiversity has not been emphasized or highlighted.

ix. The indiscriminate introduction of alien genetic material through artificial insemination (AI) and other modern approaches for livestock breeding leading to the erosion of indigenous genetic resources has not been adequately discussed.

x. The need for a specific reference to conservation agriculture in a National Land Use Policy has not been discussed or emphasized.

xi. Genetic erosion in indigenous biota and the risk of extinction is a matter of grave concern, while the narrow range of selected varieties and strains in the National Crop Breeding/Hybridization Programs leading to a reductive erosion of genetic diversity

xii. Great risk of extinction of indigenous crop wild relatives due to habitat fragmentation and over exploitation of indigenous wild terrestrial and aquatic species.

xiii. Development of resistance to chemical pesticides by pests and pathogens; and elimination of natural enemies due to indiscriminate use of chemicals.

xiv. Climate change and increased ambient temperature and CO_2 concentration in the atmosphere causing unprecedented changes in weather patterns, and the possible induction of physico-chemical disabilities in plant and animal physiology, affecting the food production process and the environment.

xv. Introduction of synthetic or hybrid varieties, and their domination over indigenous varieties.

xvi. Introduction of alien species which become invasive, and displace indigenous varieties / species and contribute to decline of pollinator population.

xvii. Promotion of monoculture agricultural production systems, which narrow species diversity, and threaten the traditional systems of sustainable, mixed agricultural cropping.

xviii. Perverse incentives and low farm gate prices for indigenous varieties, which discourage commercial scale production.

xix. Diminishing trend in the use of traditional wisdom in agricultural production, and the depletion of systems such as home gardens, forest gardens, shifting cultivation, kitchen gardens, etc.

xx. Induced consumerism through promotion of processed and artificial food products.

xxi. Introduction and promotion of genetically modified food products, whose long term effects are not known.

xxii. Lack of adequate information on status of agrobiodiversity of Sri Lanka.

RECOMMENDATIONS TO ADDRESS GAPS AND ISSUES

5. In order to address the above policy issues and gaps, BDFAP Addendum and subsequent consultations with national and global partners identified the following recommendations.

1. Recognize the existence of agricultural biodiversity and its importance in conservation, and ensure integration of these in national policies, plans and action programs.

2. Survey, inventory and making estimates of genetic resources for food and agriculture (PGRFA and FAnGR) at all levels in order to identify and designate priority/specific areas for *in situ*/ on-farm conservation including homegardens within or outside the protected ecosystems.
3. Formulate, adopt and enforce appropriate regulatory and other related legal measures to conserve agricultural biodiversity, ensure rights of holders of traditional knowledge, and facilitate access, sustainable use and equitable sharing of benefits in agricultural production systems.
4. Develop institutional and legislative mechanisms to support conservation of agricultural genetic biodiversity under *in situ* and *ex situ* conditions through the establishment of field gene banks and cryo-preservation centers.
5. Conserve, document and ensure the sustainable use of crop wild relatives, traditional agricultural knowledge, and propagate the tenets of conservation through the education system and agro-eco-tourism.
6. Identify and remove any obstacles that hinder or limit genetic conservation of agrobiodiversity, and provide suitable incentives to promote traditional agriculture through facilitating markets and value added products.
7. Establish a mechanism for capacity building, participation and empowerment of farmers through policy, advice, legislative measures and strengthening of farmer societies for conservation and utilization of such genetic resources.
8. Promote and strengthen capacities in relevant institutions in the use of molecular and morphological techniques for enhanced characterization of genetic resources for food and agriculture.
9. Promote research/assessments on traditional agro biodiversity systems, sustainability, target species of genetic resources including wild relatives and establish a public information dissemination system. Popularize R & D findings on the significance of conserving agricultural biodiversity, and enhance the scientific understanding of such conservation efforts.
10. Establish a national information sharing mechanism on genetic resources for food and agriculture including wild relatives.
11. Encourage partnerships (stakeholdership) of the private sector with rural community, to promote and sustain the traditional agro biodiversity for mutual benefits.
12. Establish the Farmers' Rights for fair trading of traditional agricultural products, and ensure sustenance of the traditional technology through mutual benefit shearing.
13. Promote and popularize traditional foods, food products and methods of preparation, and facilitate traditional food habits using formal and informal awareness programs.
14. Promote sustainable agriculture biodiversity with user-friendly technologies, by integrated management (soil, water, plant nutrient pest and gene) and farming (agroforestry, mixed aquaculture/agriculture, agro-silvi-pastoral and homegarden) systems, and diversification of crops and crop production.

Introduce policy changes to support such interventions that promote diversity in agro-ecosystems.

15. Promote, develop and commercialize under-utilized crops and species.
16. Establish mechanisms and funding arrangements for assisting farmers in disaster situations to restore agricultural systems.
17. Identify and designate priority areas for (*in situ*/on farm) conservation of specific genetic resources of plants and animals important for food and agriculture including livestock within or outside the protected ecosystems.

NATIONAL ACTION PLAN FOR AGROBIODIVERSITY CONSERVATION AND UTILIZATION IN SRI LANKA

6. This national action plan (NAP) presents the holistic approach of directives on conservation and utilization of agrobiodiversity. The main objectives of the NAP is to provide a comprehensive long term development framework including necessary guidelines, tasks, strategies and systematic approaches for conservation and utilization of agrobiodiversity in Sri Lanka using an ecosystem approach. It requires participation and collaboration of all relevant stakeholders including public sector agencies, NGOs, private sector and (farming) communities. The principles used in NAP are (i) sustainability; (ii) national commitment; and (iii) integration across sectors and disciplines. During the formulation process of this NAP consideration is given on gaps, issues and recommendations made in Biodiversity Conservation in Sri Lanka: A Framework for Action (BDFA) Addendum identified for integrated solutions in conservation and utilization of agrobiodiversity in Sri Lanka in line with the scope of the Convention on Biological Diversity (CBD). Further, National Policy documents such as draft National Agricultural Policy and 10 year Development Plan for Agriculture Sector and Global Policy documents such as 2010 Biodiversity Targets and Millennium Development Goals (MDGs) were also taken into consideration. The NAP formulation is a broad consultative process, which include stakeholders of government, semi-government, academic, research, private and non governmental sectors and also a joint effort in defining a path to achieve sustainability. The NAP should be a part of the national development plan and compatible with provincial and district development plans and strategies. All stakeholders bear responsibility to implement the measures mutually agreed upon and listed in the NAP by dedicating their efforts and resources according to respective capacities.

7. The actions required are given below.

Current knowledge, knowledge gaps on agrobiodiversity resources base in Sri Lanka and assessment and documentation of agrobiodiversity components

1. Identify, define and classify agroecosystem diversity of Sri Lanka.

2. Critically review the current knowledge on agrobiodiversity (status, trend, threat assessment, goods and services provided, economic values, policy gaps).

3. Conduct a comprehensive agrobiodiversity resource survey to fill gaps (status, trend, threat assessment, goods and services provided, economic values, policy gaps).

4. Compile indigenous knowledge related to crop and animal (including fish) genetic resources.

5. Review all Intellectual Property Right (IPR) issues on agrobiodiversity and strengthen IPR knowledge among stakeholders.

6. Critically review knowledge on alternative crops for bio-fuel and dendro-power generation and assess their impacts on agrobiodiversity.

7. Establish "pollinator initiatives" for Sri Lanka to assess pollinator population and develop a plan of action for plant pollinator conservation and utilization.

8. Establish task force to assess soil microorganism and associated soil agro biodiversity and develop a plan of action for conservation and utilization of soil agrobiodiversity.

9. Assess impact of Genetically Modified Organisms (GMOs), Genetically Modified Foods (GMFs) and any potential harmful technology on agrobiodiversity.

10. Assess impacts of climate change on agro biodiversity and food security and identify remedial measures.

11. Assess impacts of pest/diseases and their management on agrobiodiversity and vice versa.

12. Assess genetic erosion and pollution of agrobiodiversity and identify and establish remedial measures.

13. Assess and document agriculture (including fish) based land, water and soil pollution to minimize environmental degradation.

14. Identify agrobiodiversity monitoring indicators on agroecosystem health.

Enhance benefits sharing from agrobiodiversity

15. Enhance mechanisms to share benefits of agrobiodiversity through ago ecotourism and bioprospecting.

Strengthen national literacy on agrobiodiversity

16. Strengthen public awareness on agrobiodiversity at informal and formal sectors.

17. Strengthen national nutrition literacy and its link to agrobiodiversity through participatory knowledge management.

Strengthen national research capacity and research on agrobiodiversity

18. Develop research priorities and enhance research capacities to increase productivity and profitability of agrobiodiversity.

Promote agrobiodiversity conservation and utilization

19. Identify appropriate options for *in situ*, *ex situ* and on farm conservation of components of agrobiodiversity.

20. Promote establishment of field gene banks of important crops and underutilized species.

21. Develop and introduce methods to enhance utilization of culturally, nutritionally, therapeutically and traditionally important crops, livestock and medicinal pants.

22. Develop and introduce methods to enhance involvement of women and youth in conservation and utilization of agrobiodiversity.

23. Strengthen community based agrobiodiversity conservation and utilization for food and nutritional security and income generation.

24. Develop mechanisms to conserve and utilization Farm Animal Genetic Resources (FAnGR) including genetic diversity in indigenous livestock and their Wild Relatives (WR).

25. Promote conservation and utilization of Crop Wild Relatives (CWR).

26. Promote conservation and utilization of native fodder plants.

27. Promote local processing and utilization options of plant and animal products.

28. Promote agrobiodiversity in appropriate agricultural systems through crop diversification, i.e. homegardening and agroforestry.

29. Promote wider utilization of agrobiodiversity into nutrition instruments and poverty reduction strategies (i.e. national policy and planning, poverty reduction papers, food security projects etc).

30. Recognize and reward those who practice good agricultural practices (GAPs).

31. Encourage integration of agrobiodiversity conservation and utilization in combination with associated indigenous knowledge systems and modern agricultural practices and technology.

32. Encourage speedy and quality production of diverse planting material for distribution.

33. Develop and disseminate technologies to minimize postharvest losses of fruits and vegetables.

34. Promote technology transfer to increase utilization of agrobiodiversity.

35. Promote agrobiodiversity conservation and utilization through "model biovillages".

Enhance market availability

36. Promote public-private sector partnership for agrobiodiversity conservation and utilization.

37. Promote local markets and facilitate access to international markets for products of agrobiodiversity.

Linkages to existing projects

38. Develop implementation modalities and mechanisms for recommendations of current CWR and FAnGR projects.

Policy issues and threats to agrobiodiversity

39. Develop modalities to control agrobiodiversity related invasive species through legal and quarantine measures.

40. Promote economic uses of agricultural waste.
41. Establish National Agrobiodiversity Conservation Advisory Group.