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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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THE GLOBAL PLAN OF ACTION FOR THE CONSERVATION AND SUSTAINABLE UTILIZATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE AND THE ECOSYSTEM APPROACH

Towards Sustainable Agriculture: Collaborative Implementation of the *Global Plan of Action* and the Convention on Biological Diversity

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1. INTRODUCTION

1. This information paper was prepared by the Seed and Plant Genetic Resources Service (AGPS) of the Agriculture Department, as a response to the recognition of emerging issues in agricultural biodiversity[1], and in particular, in light of (i) considerations of FAO's Commission on Genetic Resources for Food and Agriculture, especially at its 10th Regular Session; (ii) the Convention on Biological Diversity (COP Decisions V/6 and VII/11), and; (iii) inputs to the Multi-Year Programme of Work of the CGRFA (currently under development).

2. The Commission on Genetic Resources for Food and Agriculture, at its 10th Regular Session, welcomed the innovative work carried out by FAO on various aspects of biodiversity, and emphasized that FAO should continue collaboration with the Convention on Biological Diversity (CBD). More specifically, areas for possible further work were suggested by some countries, including "*how ecosystem approaches can increase the range of benefits from agricultural biodiversity*"[2].

3. In COP Decision VII/11, Parties to the CBD requested the Executive Secretary, in collaboration with Parties and relevant international and regional organizations, to facilitate *inter alia* the undertaking of an analysis of the range of existing tools and approaches that are consistent with the Convention's ecosystem approach, but operate on different levels and belong to a variety of sectors, in order to learn from their experiences and build upon their approaches, and identify any gaps in the coverage of such tools. Examining opportunities to jointly implement various aspects of the *Global Plan of Action* and the Convention on Biological Diversity at the farm and landscape levels will be extremely helpful in determining the practicality of the ecosystem approach and the need for any adjustments. The Decision encourages work to achieve synergies at the national level between the ecosystem approach and the various programmes of work of the Convention on Biological Diversity, as well as promoting linkages with other international initiatives.

4. Lastly, in preparation of the Multi-Year Programme of Work of the CGRFA, it is brought to the attention of the Intergovernmental Working Group on PGRFA that there are a number of emerging issues that the Commission may need to take into account. Some relate directly to ongoing international activities, particularly those of the Convention on Biological Diversity, and to invitations by its Conference of the Parties that FAO lead international activities in this regard.[3] *One of these merging issues is the ecosystem approach to agrobiodiversity in the area of PGRFA.*

5. The purpose of this information paper is to highlight areas in agriculture where the ecosystem approach can be used in achieving the goals of international instruments related to the conservation and sustainable utilization of agricultural biodiversity. Specifically, the objective of the information paper is to bring to the attention of the reader the synergies between the Ecosystem Approach of the Convention on Biological Diversity, and the *Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture*.

6. Hence, the information paper presents an overview of the Ecosystem Approach and a preliminary analysis of potential synergies between the application and implementation of these. It

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[1] This was undertaken, bearing in mind that FAO was invited by the Executive Secretary of the CBD to support the development of the Programme of Work on Agricultural Biodiversity (COP decision V/5)

[2] CGRFA-10/REP (para. 72-74)

ftp://ext-ftp.fao.org/ag/cgrfa/cgrfa10/r10repe.pdf

[3] CGRFA/WG-PGR-3/05/8

ends with future considerations to achieve an integrative management approach and place biodiversity conservation and sustainable use into a broader development agenda.

2 THE ECOSYSTEM APPROACH

7. The ecosystem[4] approach is described by the CBD Ssecretariat as a strategy for implementing its objectives. To assist understanding and application of the ecosystem approach, the Conference of the Parties to the Convention endorsed a description of the ecosystem approach, 12 principles, and five points of operational guidance (COP Decision V/6, see annex I) [5].

8. The Convention's thematic programmes of work incorporate the ecosystem approach, which is also reflected in the Strategic Plan of the Convention. Guidelines to assist implementation of the ecosystem approach have been developed [6] based on Decision V/6, and describe the ecosystem approach as follows:

- A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.
- Is based on the application of appropriate scientific methodologies focused on levels of biological organization, which encompass the essential structure, processes, functions and interactions among organisms and their environment. It recognizes that humans, with their cultural diversity, are an integral component of most ecosystems.
- Requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of their functioning. Management must be adaptive in order to be able to respond to such uncertainties and contain elements of "learning-by-doing" or research feedback.
- There is no single way to implement the ecosystem approach, as it depends on local, provincial, national, regional or global conditions. There are many ways in which ecosystem approaches may be used as the framework for delivering the objectives of the Convention in practice.

3. SYNERGIES BETWEEN THE IMPLEMENTATION OF THE GLOBAL PLAN OF ACTION AND THE APPLICATION OF THE ECOSYSTEM APPROACH

9. The following paragraphs identify several areas of synergy between the Priority Activities of the *Global Plan of Action* and the principles and operational guidance of the ecosystem approach. They attempt to identify potential benefits of collaboration to enhance implementation of both the *Global Plan of Action* and the Convention on Biological Diversity.

10. **Support to integrated policy development and planning –** Effective implementation of the *Global Plan of Action* requires a sound policy and planning framework at national and international levels. This is reflected in Priority Activity 15, which calls for the building of strong national programmes.

11. Integration of economic, social, cultural and environmental objectives and policies is widely accepted as essential to achieve sustainable development. However, mechanisms for achieving

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[4] Article 2 of the Convention on Biological Diversity defines “ecosystem” as a dynamic complex of plant, animal and microorganism communities and their non-living environment interacting as a functional unit. This definition does not specify any particular spatial unit or scale. The term "ecosystem" can refer to any functioning unit at any scale. Indeed, the scale of analysis and action should be determined in relation to the problem being addressed. It could, for example, be a grain of soil, a pond, a forest, a biome or the entire biosphere

[5] COP Decision V/6: http://www.biodiv.org/decisions/?lg=0&dec=V/6

[6] CBD GUIDELINES: The Ecosystem Approach - Secretariat for the Convention on Biological Diversity http://www.biodiv.org/decisions/default.aspx?m=COP-07&id=7748&lg=0)

integration are still in the early phases of development, and integration of agriculture and environmental policy development is yet to be achieved in many countries. Strongly linking implementation of the *Global Plan of Action* with efforts to implement the Convention on Biological Diversity through the application of the ecosystem approach would assist countries to integrate their biodiversity policies and plans. Linkages between these mutually supportive agreements could result in both stronger national programmes for plant genetic resources, and broader national biodiversity strategies for conservation and sustainable use objectives.

12. **Enhance integrated ecosystem management for ecological and economic sustainability –** While not explicitly addressed with the *Global Plan of Action*, sustainable use of plant genetic resources, as a contribution to reducing poverty and hunger, requires ecological sustainability of farm systems over the long-term. Implementation of a number of the Priority Activities of the *Global Plan of Action* will contribute to efforts to ensure ecological sustainability at the farm level and to some degree the landscape level.

13. Successful implementation of the *Global Plan of Action* will require understanding ecological and economic sustainability, with growing demands to increase food production while achieving environment protection goals. Farming practices affect both on-farm sustainability and ecological sustainability of adjacent ecosystems and landscapes, and thus, to achieve environmental or ecological sustainability, farmers must consider both long-term on-farm sustainability needs as well as wider environmental considerations as land managers and stewards of biodiversity.

14. Farmers are the custodians of biological diversity in agricultural ecosystems, providing ecological sustainability. A multi-disciplinary approach will promote interactions among farmers, environment scientists, ecologists, and others, which are essential to take into account both on-farm management and the resulting sustainability of adjacent ecosystems and landscapes. Building synergies between efforts to implement the *Global Plan of Action* and efforts to implement the Convention on Biological Diversity through the application of the ecosystem approach should be beneficial in bringing together all available relevant expertise to design and implement farm practices within a long-term ecological sustainability framework.

15. **Develop meaningful participation and developing strong conservation coalitions –** Participatory mechanisms that empower and promote involvement of all stakeholders to build support for biodiversity conservation are required in all countries. *The Global Plan of Action* recognizes the importance developing participatory mechanisms, and establishing partnerships and networks to achieve the conservation and sustainable use of plant genetic resources. Implementation of the Convention on Biological Diversity through the ecosystem approach also promotes partnerships and the full participation of stakeholders in decision-making.

16. Given the common recognition of the need to ensure meaningful participation of stakeholders in the implementation of the *Global Plan of Action* and the Convention on Biological Diversity through the application of the ecosystem approach, there would appear to be an excellent opportunity to promote the establishment of coalitions and partnerships among all those concerned with the conservation and sustainable use of plant genetic resources and those focussed on other components of biodiversity.

4. FUTURE CONSIDERATIONS

17. The Convention on Biological Diversity and the *Global Plan of Action* are important international instruments with common objectives or aims. Collaboration at all levels, among diverse stakeholders concerned with achieving the objectives of both the *Global Plan of Action* and the Convention on Biological Diversity should lead to improved advocacy, sharing of expertise and resources, and formulation of partnerships at the early stages of decision-making. Also, stronger national programmes for plant genetic resources and national biodiversity strategies and action plans have great potential to link two very important global agreements at the national

level, and thereby, build and enhance synergies among the various authorities, institutions and organizations devoted to ensuring implementation of both agreements.

18. Collaborative implementation of the Priority Activity Areas of the *Global Plan of Action* and the Convention on Biological Diversity, through application of the ecosystem approach, should also have the added benefit of enhancing efforts to understand the requirement for achieving long-term sustainable agricultural development and sustainability at the landscape level.

19. A new approach to monitor the implementation of the *Global Plan of Action* through a country-driven and flexible system is being used in countries. Feedback to the new monitoring questionnaires will provide a basis to further explore how countries are implementing the *Global Plan of Action* in appreciation of the application of the Ecosystem Approach. Hence, the new monitoring approach for the implementation of the *Global Plan of Action* could provide an opportunity for analysing how countries are implementing the *Global Plan of Action*, in light of synergies with the Ecosystem Approach.

20. Consideration of the application of the ecosystem approach may also be useful in the preparation of the second *Report on the State of the World's Plant Genetic Resources*. It could result in better understanding of the ecological interactions between plant genetic resources for food and agriculture and crop associated biodiversity (pests, diseases, natural enemies, pollinators), and awareness of ecosystem services provided by plant genetic resources for food and agriculture.

21. Members Countries may wish to take note of how to explore synergies between the *Global Plan of Action* and the Ecosystem Approach from an agricultural perspective, and prepare case studies on the application of the ecosystem approach to the *Global Plan of Action* as a means to further test the concept. Member Countries may wish to determine any possible adjustments to the principles and operational guidance, and provide inputs to a possible future of the GPA.

22. The *Global Plan of Action* is a comprehensive and ambitious plan that requires mobilization of significant expertise and financial resources. Recognition of the *Plan's* contribution to global efforts to achieve the objectives on the conservation and sustainable utilization of biological diversity, such as the Programme of Work on Agricultural Biodiversity, should be re-emphasized, and valorized.

ANNEX I THE ECOSYSTEM APPROACH – PRINCIPLES AND OPERATIONAL GUIDANCE[7]

Principles

Principle 1: *The objectives of management of land, water and living resources are a matter of societal choices***.**

Different sectors of society view ecosystems in terms of their own economic, cultural and society needs. Indigenous peoples and other local communities living on the land are important stakeholders and their rights and interests should be recognized. Both cultural and biological diversity are central components of the ecosystem approach, and management should take this into account. Societal choices should be expressed as clearly as possible. Ecosystems should be managed for their intrinsic values and for the tangible or intangible benefits for humans, in a fair and equitable way.

Principle 2: *Management should be decentralized to the lowest appropriate level.*

Decentralized systems may lead to greater efficiency, effectiveness and equity. Management should involve all stakeholders and balance local interests with the wider public interest. The closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge.

Principle 3: *Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.*

Management interventions in ecosystems often have unknown or unpredictable effects on other ecosystems; therefore, possible impacts need careful consideration and analysis. This may require new arrangements or ways of organization for institutions involved in decision-making to make, if necessary, appropriate compromises.

Principle 4: *Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Any such ecosystem-management programme should:*

a) Reduce those market distortions that adversely affect biological diversity;
b) Align incentives to promote biodiversity conservation and sustainable use;
c) Internalize costs and benefits in the given ecosystem to the extent feasible.

The greatest threat to biological diversity lies in its replacement by alternative systems of land use. This often arises through market distortions, which undervalue natural systems and populations and provide perverse incentives and subsidies to favour the conversion of land to less diverse systems.

Often those who benefit from conservation do not pay the costs associated with conservation and, similarly, those who generate environmental costs (e.g. pollution) escape responsibility. Alignment of incentives allows those who control the resource to benefit and ensures that those who generate environmental costs will pay.

[7] ENDORSED BY THE CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY (COP DECISION V/6)
HTTP://WWW.BIODIV.ORG/DECISIONS/DEFAULT.ASPX?M=COP-05&ID=7148&LG=0

Principle 5: *Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.*

Ecosystem functioning and resilience depends on a dynamic relationship within species, among species and between species and their abiotic environment, as well as the physical and chemical interactions within the environment. The conservation and, where appropriate, restoration of these interactions and processes is of greater significance for the long-term maintained conditions and, accordingly, management should be appropriately cautious.

Principle 6*: Ecosystem must be managed within the limits of their functioning.*

In considering the likelihood or ease of attaining the management objectives, attention should be given to the environmental conditions that limit natural productivity, ecosystem structure, functioning and diversity. The limits to ecosystem functioning may be affected to different degrees by temporary, unpredictable of artificially maintained conditions and, accordingly, management should be appropriately cautious.

Principle 7: *The ecosystem approach should be undertaken at the appropriate spatial and temporal scales.*

The approach should be bounded by spatial and temporal scales that are appropriate to the objectives. Boundaries for management will be defined operationally by users, managers, scientists and indigenous and local peoples. Connectivity between areas should be promoted where necessary. The ecosystem approach is based upon the hierarchical nature of biological diversity characterized by the interaction and integration of genes, species and ecosystems.

Principle 8: *Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.*

Ecosystem processes are characterized by varying temporal scales and lag-effects. This inherently conflicts with the tendency of humans to favour short-term gains and immediate benefits over future ones.

Principle 9: *Management must recognize the change is inevitable.*

Ecosystems change, including species composition and population abundance. Hence, management should adapt to the changes. Apart from their inherent dynamics of change, ecosystems are beset by a complex of uncertainties and potential "surprises" in the human, biological and environmental realms. Traditional disturbance regimes may be important for ecosystem structure and functioning, and may need to be maintained or restored. The ecosystem approach must utilize adaptive management in order to anticipate and cater for such changes and events and should be cautious in making any decision that may foreclose options, but, at the same time, consider mitigating actions to cope with long-term changes such as climate change.

Principle 10: *The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.*

Biological diversity is critical both for its intrinsic value and because of the key role it plays in providing the ecosystem and other services upon which we all ultimately depend. There has been a tendency in the past to manage components of biological diversity either as protected or non-protected. There is a need for a shift to more flexible situations, where conservation and use are seen in context and the full range of measures is applied in a continuum from strictly protected to human-made ecosystems

Principle 11: *The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices.*

Information from all sources is critical to arriving at effective ecosystem management strategies. A much better knowledge of ecosystem functions and the impact of human use is desirable. All relevant information from any concerned area should be shared with all stakeholders and actors, taking into account, inter *alia*, any decision to be taken under Article 8(j) of the Convention on Biological Diversity. Assumptions behind proposed management decisions should be made explicit and checked against available knowledge and views of stakeholders.

Principle 12: *The ecosystem approach should involve all relevant sectors of society and scientific disciplines.*

Most problems of biological-diversity management are complex, with many interactions, side-effects and implications, and therefore should involve the necessary expertise and stakeholders at the local, national, regional and international level, as appropriate.

OPERATIONAL GUIDANCE

1. Focus on the relationships and processes within ecosystem.

The many components of biodiversity control the stores and flows of energy, water and nutrients within ecosystems, and provide resistance to major perturbations. A much better knowledge of ecosystem functions and structure, and the roles of the components of biological diversity in ecosystems, is required, especially to understand: (i) ecosystem resilience and the effects to biodiversity loss (species and genetic levels) and habitat fragmentation; and (ii) underlying causes of biodiversity loss; and iii) determinants of local biological diversity in management decisions. Functional biodiversity in ecosystems provides many goods and services of economic and social importance. While there is a need to accelerate efforts to gain new knowledge about functional biodiversity, ecosystem management has to be carried out even in the absence of such knowledge. The ecosystem approach can facilitate practical management by ecosystem managers (whether local communities or national policy makers).

2. Enhance benefit-sharing.

Benefits that flow from the array of functions provided by biological diversity at the ecosystem level provide the basis of human environmental security and sustainability. The ecosystem approach seeks that the benefits derived from these functions are maintained or restored. In particular, these functions should benefit the stakeholders responsible for their production and management. This requires, inter alia: capacity building, especially at the level of local communities managing biological diversity in ecosystems; the proper valuation of ecosystem goods and services; the removal of perverse incentives that devalue ecosystem goods and services; and, consistent with the provisions of the Convention on Biological Diversity, where appropriate, their replacement with local incentives for good management practices.

3. Use adaptive management practices.

Ecosystem processes and functions are complex and variable. Their level of uncertainty is increased by the interaction with social constructs, which need to be better understood. Therefore, ecosystem management must involve a learning process, which helps to adapt methodologies and practices to the ways in which these systems are being managed and monitored. Implementation programmes should be designed to adjust to the unexpected, rather than to act on the basis of a belief in certainties. Ecosystem management needs to recognize the diversity of social and cultural factors affecting natural-resource use. Similarly, there is a need for flexibility in policy-making and implementation.

Long-term, inflexible decisions are likely to be inadequate or even destructive. Ecosystem management should be envisaged as a long-term experiment that builds on its results as it progresses. This "learning-by-doing" will also serve as an important source of information to gain knowledge of how best to monitor the results of management and evaluate whether established goals are being attained. In this respect, it would be desirable to establish or strengthen capacities of Parties for monitoring.

4. Carry out management actions at the scale appropriate for the issue being addressed, with decentralization to lowest level, as appropriate.

As noted in the description of the ecosystem approach, an ecosystem is a functioning unit that can operate at any scale, depending upon the problem or issue being addressed. This understanding should define the appropriate level for management decisions and actions. Often, this approach will imply decentralization to the level of local communities. Effective decentralization requires proper empowerment, which implies that the stakeholder both has the opportunity to assume responsibility and the capacity to carry out the appropriate action, and needs to be supported by enabling policy and legislative frameworks. Where common property resources are involved, the most appropriate scale for management decisions and actions would necessarily be large enough to encompass the effects of practices by all relevant stakeholders. Appropriate institutions would be required for such decision-making and, where necessary, for conflict resolution. Some problems and issues may require action at still higher levels, through, for example, transboundary cooperation, or even cooperation at global levels.

5. Ensure intersectoral cooperation.

As the primary framework of action to be taken under the Convention, the ecosystem approach should be fully taken into account in developing and reviewing national biodiversity strategies and action plans. There is also a need to integrate the ecosystem approach into agriculture, fisheries, forestry and other production systems that have an effect on biodiversity. Management of natural resources, according to the ecosystem approach, calls for increased intersectoral communication and cooperation at a range of levels (government ministries, management agencies, etc.). This might be promoted through, for example, the formation of inter-ministerial bodies within the Government or the creation of networks for sharing information and experience.