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COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Item 3 of the Provisional Agenda

INTERGOVERNMENTAL TECHNICAL WORKING GROUP ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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GLOBAL NETWORKING ON *IN SITU* CONSERVATION OF PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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I. INTRODUCTION

Plant Genetic Resources for Food and Agriculture

1. "Plant genetic resources for food and agriculture" (PGRFA) means "any genetic material of plant origin of actual or potential value for food and agriculture". "Genetic material" means "any material of plant origin, including reproductive and vegetative propagating material, containing functional units of heredity."[1] PGRFA thus include wild ancestors or related species of modern crops, i.e. crop wild relatives (CWR); wild plants harvested for food; farmers' varieties/landraces and modern varieties developed by breeders.

2. These include farmers' varieties/landraces; modern varieties developed by breeders; wild ancestors or related species of modern crops, i.e. crop wild relatives; and wild plants harvested for food.

Recent Steps Taken Towards Establishing a Global Network on* In Situ *Conservation of PGRFA

3. The Commission on Genetic Resources for Food and Agriculture (Commission), at its Fifteenth Regular Session held in January 2015, requested FAO to convene, before the Eighth Session of the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture (Working Group) and, subject to availability of extrabudgetary funds, an informal multistakeholder dialogue to discuss options for networking for *in situ* conservation and on-farm management, its functions, governance and budgetary requirements, in particular to ensure its long-term funding. The informal multistakeholder dialogue was held on 6 and 7 June 2016.

4. Following this, FAO presented a concept note on *Global networking on* in situ *conservation and on-farm management of plant genetic resources for food and agriculture* to the Commission, at its Sixteenth Regular Session, held from 30 January to 3 February 2017. The concept note reflected the outcomes of the informal multistakeholder dialogue and the reccommendations provided by the Working Group. The Commission took note of the informal multistakeholder dialogue, reviewed the concept note on *Global networking on* in situ *conservation and on-farm management of plant genetic resources for food and agriculture*[2] and referred it to the Working Group for further consultations.

5. There are substantive differences between the themes, *in situ* conservation and on-farm management of PGRFA, in terms of stakeholders and their respective applicable legal and policy instruments. In view of these and in accord with the opinion of the Bureau of the Seventeenth Regular Session of the Commission in May 2017, two separate concept notes have been prepared proposing the establishment of a global network for each of the themes.

6. This document, prepared for the consideration the Working Group, underscores the need for, and analyses the feasibility of, a global networking mechanism for *in situ* conservation of PGRFA. The document further provides an overview of the financial implications of the global network and also suggests steps and means necessary to establish the network.

II. THE IMPORTANCE OF *IN SITU* CONSERVATION OF PGRFA

7. Globally, significant progress has been made with the *ex situ* conservation (i.e. the safeguarding in genebanks) of CWR and wild food plants. However, a significant proportion of these resources are still at risk as collections may be lost in times of civil strife and natural disasters or simply due to sub-standard management. Conserving PGRFA *in situ* is of critical importance for wild crop genepools in their centres of origin and diversity.

8. It is estimated that between 50 000 and 60 000 CWR species exist worldwide. Of these, approximately 700 are considered high priority as they constitute parts of the primary and secondary genepools of the world's most important food crops, many of which are included in Annex 1 of the International Treaty on Plant Genetic Resources for Food and Agriculture (International Treaty). Plant

[1] International Treaty on Plant Genetic Resources for Food and Agriculture, Article 2.
[2] CGRFA-16/17/Inf.20.

breeders and other scientists have sourced the heritable diversity used in developing progressively better crop varieties from CWR since the early 20th century. Through these improved crop varieties, the gene variants that are carried by CWR are therefore contributing to increased crop productivity and food quality and hence to food security, nutrition, improved human health and poverty alleviation. Genes for pest and disease resistance contribute directly to increased crop yields and to reduced use of pesticides and fungicides. Genes for abiotic stress tolerance reduce the need for non-renewable inputs, especially in marginal environments. The optimal conservation and sustainable use of CWR are essential for increasing food security, eliminating poverty, and protecting the environment, therefore.

9. Wild food plants are critical sources of nutrients such as important vitamins, minerals and other nutrients that complement those of staple crops. They also serve cultural purposes and are of special relevance for livelihoods, especially in the seasonal periods of scarcity of food - prior to harvesting and during times of crop failures. They encompass a wide range of species, including roots and tubers, leafy vegetables and fruits.

10. The natural populations of many CWR are increasingly at risk. They are threatened by habitat loss through the destruction and degradation of natural environments and/or their conversion to other uses. Deforestation is leading to the loss of many populations of important wild relatives of fruits, nuts, and industrial crops (e.g. mango, rubber, coffee). Populations of wild relatives of cereal crops that occur in arid or semi-arid lands are being severely reduced by over-grazing and desertification. Mountain areas in particular are vulnerable to CWR losses, as their fragile ecosystems are easily degraded through overuse by humans. A systematic and coordinated effort to conserve CWR and wild food plants is required to address the negative effects of genetic erosion. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change stressed that plant species cannot naturally shift their geographical ranges sufficiently quickly enough to keep up with current and the projected rapid rates of climate change in most landscapes[3].

11. To prevent the loss of these genetic resources and maximize availability for future crop improvement efforts, there is an urgent need to ensure appropriate conservation and sustainable use at global, regional, national and local levels. This need has been recognized by international conventions and agreements, including the *Convention on Biological Diversity* (CBD)[4], the International Treaty[5] and the *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture* (Second GPA)[6]. Most recently, the international community highlighted the importance of the sustainable use of biodiversity and genetic resources for the achievement of Sustainable Development Goal 2 of the 2030 Agenda for Sustainable Development (i.e. End hunger, achieve food security and improved nutrition and promote sustainable agriculture)[7].

12. Like CWR, habitat loss threatens the continued existence of wild food plants. Additionally, various drivers of genetic erosion, including changes in agricultural practices, the introduction of modern crop varieties, changes to land use, climate change and other factors, are increasingly threatening the continued existence, and hence availability, of these resources. Consequently, *in situ* conservation and *ex situ* conservation should be considered as complementary practices for the management of this PGRFA diversity; one does not negate the other.

13. The first *Report* of the *State of the World's Plant Genetic Resources for Food and Agriculture* recommended the establishment of a system of *in situ* conservation areas[8]. Subsequently, a study undertaken in 2009 under the aegis of the Commission[9] provided an overview of the status and needs

[3] IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.
[4] https://www.cbd.int/
[5] http://www.fao.org/plant-treaty/en/
[6] http://www.fao.org/docrep/015/i2624e/i2624e00.htm
[7] https://sustainabledevelopment.un.org/sdg2
[8] FAO. 1996. The State of the World's Plant Genetic Resources for Food and Agriculture. FAO, Rome
[9] Maxted, N. & Kell, S.P. 2009. Establishment of a global network for the in situ conservation of crop wild relatives: status and needs. FAO Commission on Genetic Resources for Food and Agriculture, Rome. 266 pp.

for the establishment of a global network for the conservation of CWR. The study recommended a strategic and coordinated approach to the conservation of CWR through: building consensus between biodiversity and agrobiodiversity communities; enhancing the availability of CWR for breeders' use; addressing the sustainability of CWR conservation; improving information dissemination; and, conducting priority CWR research activities.

14. The designation of a protected area, for instance, can serve several purposes simultaneously since different gene pools (e.g. for crop breeding, forestry, forage production, wildlife) often co-exist, and thus can be maintained in the same area. Furthermore, links between practitioners concerned with *in situ* conservation of biodiversity in general and those concerned with *in situ* conservation of PGRFA exclusively, which are extremely weak in almost all countries, could be strengthened.

III. CURRENT STATUS OF *IN SITU* CONSERVATION OF PGRFA

15. While many countries have reported an increase in the number of *in situ* conservation activities, they have not always been well coordinated. The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture highlighted that here has been little progress on the development of sustainable management techniques for PGRFA harvested from the wild, which are still largely managed following traditional practices. Overall, initiatives addressing the management of PGRFA outside genebanks, including *in situ* conservation of PGRFA,[10] appear scattered, not aligned to national conservation strategies and lack the coordination required for them to coalesce into national, regional and global mechanisms. Furthermore, many countries still lack national strategies and/or action plans for the management of this diversity or, if they have them, do not fully implement them.

IV. THE NEED FOR, AND FEASIBILITY OF, A GLOBAL NETWORK ON *IN SITU* CONSERVATION OF PGRFA

16. The centres of diversity of plants (including crops), i.e. Vavilov Centres, which contain large numbers of important crop relatives, are located largely within different developing countries[11]. Although most of these countries have listed the conservation of CWR within their national biodiversity and agricultural development strategies, they generally possess limited resources thus constraining investment in programmes that can support the effective conservation and optimum use of CWR. Actively conserving this genetic diversity in networks of protected areas will significantly improve the understanding of their value in ecosystem services, which in turn will underpin the long-term security of the protected area itself.

17. The need for conserving PGRFA *in situ* is specifically referred to in international frameworks. The Second GPA[12] directly addresses the conservation and sustainable use of PGRFA. In particular, its Priority Activity 4 focuses on "Promoting *in situ* conservation and management of crop wild relatives and wild food plants" and Priority Activity 14 focuses on "Promoting and strengthening networks for plant genetic resources for food and agriculture". The International Treaty also encourages the participation of all relevant institutions, including governmental, private, non-governmental, research, breeding and other institutions, in international networks (Article 16.2). The objective of these frameworks is to benefit countries and provide a means for countries with similar challenges to pool efforts and resources and share benefits.

18. Currently, there is no overarching global platform or network that provides coordination, sets, monitors and/or enforces standards and/or protocols, aligns efforts or advocates on this theme. A global networking mechanism will address these shortcomings and ensure a greater impact of the efforts made at national and regional levels. The confidence built through the implementation of mutually beneficial

[10] Please refer to the Second Report on the State of the World's PGRFA
[11] FAO 2010. The Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture. Rome. Available at: http://www.fao.org/docrep/013/i1500e/i1500e.pdf
[12] http://www.fao.org/docrep/015/i2624e/i2624e00.htm

joint activities will ultimately enhance the exchange of germplasm of CWR and the associated information, including indigenous knowledge.

19. The establishment of a global network for *in situ* conservation is feasible as it can easily build on existing networks and partnerships such as regional and global networks relating to wild crop genetic resources, e.g. CGIAR[13], Crop Trust[14], International Union for the Conservation of Nature (IUCN)[15], Botanic Gardens Conservation International (BGCI)[16], European Cooperative Programme for Plant Genetic Resources (ECPGR)[17], MusaNet[18], amongst others.

20. A global network could leverage FAO's *Voluntary Guidelines for the Conservation and Sustainable Use of Crop Wild Relatives and Wild Food Plants*[19], which guide the development of national plans for the conservation and sustainable use of CWR and wild food plants. Areas of work that are most effectively implemented through a global community of practice, such as is being proposed, include setting priorities, enhancing national and international cooperation, the further development of information systems and identifying gaps in the conservation of CWR and wild food plants.

V. GOAL OF GLOBAL NETWORK ON *IN SITU* CONSERVATION OF PGRFA

21. A global network on on-farm management of PGRFA would provide a platform for scientific discussion, information sharing, policy development, technology transfer and collaboration on research and development. The Multistakeholder Dialogue, held in July 2016, identified as a possible goal of the network to:

> *Contribute to the implementation of the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture and the achievement of Sustainable Development Goal Target 2.5 by strengthening on-farm management and sustainable use of plant genetic resources for food and agriculture, taking into account the complementarity of different* in situ *and* ex situ *conservation approaches and the need to balance them*[20].

22. Upon inception, the network could decide to base discussions of its goal on the above text. For the moment, no existing global network addresses this goal and there seems to be agreement among stakeholders that a global network could indeed help strengthen *in situ* conservation without losing sight of the important role of *ex situ* conservation and the need to balance and wisely coordinate different conservation approaches.

VI. FUNCTIONS AND ACTIVITIES OF A GLOBAL NETWORK ON *IN SITU* CONSERVATION OF PGRFA

23. To ensure efficiencies and avoid the duplication of efforts, the global network should build on existing networks, have functions currently not covered by any other entity and which are best attributed to a network. It should also enable the conglomeration of intra- and inter-country collaborations into regional and, ultimately, global initiatives that are based on shared objectives and driven by common goals. Possible specific functions of the network include:

- Increasing capacity, collaboration, coordination and the exchange of information and experience between existing national and regional networks, organizations, projects and stakeholders, especially by serving as a platform through which stakeholders of the environmental and

[13] https://www.cgiar.org/
[14] https://www.croptrust.org/
[15] https://www.iucn.org/
[16] http://www.bgci.org/
[17] http://www.ecpgr.cgiar.org/
[18] http://www.musanet.org/
[19] http://www.fao.org/3/a-i7788e.pdf
[20] CGRFA-16/17/Inf.21, *Annex II*.

agricultural sectors might find synergistic ways for delivering at scale, in particular in order to reflect the multi-functional aspects of *in situ* conservation of PGRFA;

- Raising awareness of *in situ* conservation of PGRFA, influencing policy development, and facilitating participation of stakeholders in policy development and decision-making at national, regional and international levels;
- Enabling the optimization of the conservation and sustainable use of the diversity of CWR and wild food plants as complementary approaches in parks and protected areas by, *inter alia*, facilitating the increased participation of indigenous and local communities;
- Enhancing communication and synergies among the various bodies, especially between the agriculture and environment sectors, engaged in *in situ* conservation and land use management at national and regional levels;
- Coordinating and communicating global assessments of the threats to, and the status of conservation of, priority CWR and wild food plants;
- Fostering the development of collaborative global plans and practices for the protection of PGRFA *in situ;*
- Facilitating the generation and dissemination of the evidence base and tools for the sustainable uses of wild plants as sources of income and food, food security, nutrition and environmental health, especially in support of the benefits to local economies, women and minority groups;
- Enabling the definition of areas of work, work programme and clusters of work; and
- Facilitating the mobilization of resources, in streamlined and coherent initiatives that avoid the fragmentation of efforts, for the above-mentioned functions and activities.

VII. GOVERNANCE, STRUCTURE AND MANAGEMENT OF A GLOBAL NETWORK ON *IN SITU* CONSERVATION OF PGRFA

24. In considering the establishment of a network, numerous governance options may be evaluated. To ensure the coordination and support of the network in its initial phase, it may be useful to establish a Facilitation Committee consisting of selected members of the "community of practice", as well as a few key resource persons from international organizations or research institutes. The mandate of this committee would be to prepare for meetings of the network. Subject to the availability of the necessary financial resources, FAO could facilitate the preparation of meetings, including an inaugural meeting.

25. The network would consist of a number of interrelated organizations bound by a common set of goals that address *in situ* conservation of CWR and wild food plants. It would serve to build bridges and partnerships with other communities of practice. It should be open to all stakeholder groups. It should be transparent. Moreover, its meetings should be held, where possible, back-to-back with other relevant meetings, such as sessions of the Commission's Working Group.

VIII. FINANCIAL IMPLICATIONS OF A GLOBAL NETWORK ON ON-FARM MANAGEMENT OF PGRFA

26. Costs for the establishment and running of the global network will depend on agreed functions and structure, as well as the scope of its interventions and activities, the number of meetings foreseen and the staff required to deliver on agreed functions and to perform agreed activities. However, initial funds, estimated at USD **238 750** (Table 1), at the minimum, would be required for organizing and hosting the inaugural meeting.

Table 1: Preparation of the inaugural meeting of a network on on-farm management of PGRFA

Items of Expenditure		**Cost (USD)**	**Total (USD)**
Meeting logistics	Direct Costs of the Meeting (interpretation, messengers)	45 000	
	Document preparation	15 000	
	Documentation (translation/printing)	25 000	85 000
Participants' travel	60 participants	60 000	60 000
Human resources (HR) [as FAO in-kind contribution]	P4 (25%) for 12 months	55 250	
	G4 (25%) for 12 months	23 500	78 750
Staff travel		15 000	15 000
Grand total			**238 750**

Table 1 contains, as an example, the draft budget for an inaugural meeting of the network. The draft budget is based on the assumption that FAO would facilitate the preparation of the 2-day inaugural meeting.

IX. MEANS AND STEPS NECESSARY TO ESTABLISH A GLOBAL NETWORK ON *IN SITU* CONSERVATION OF PGRFA

27. It is important to consider concrete immediate steps that will engender the desired 'ownership' by the stakeholder base. One important step that has been taken is the multistakeholder dialogue on *in situ* conservation and on-farm management of PGRFA held in June 2016. It brought together a very diverse range of different stakeholders involved in *in situ* conservation and/or on-farm management of PGRFA such as Bioversity International, *Movimiento de los Pequeños Agricultores* (MPA) of Brazil, the National Gene Bank of Egypt, the Chinese Academy of Sciences, Globally Important Agricultural Heritage Systems (GIAHS), and the Centre for Sustainable Development and Environment (CENESTA) of Iran. These stakeholders, buttressing the repeated requests by the Commission, have all expressed the desire to collaborate in a globally coordinated mechanism as a means to strengthen *in situ* conservation and/or on-farm management of PGRFA.

28. Having demonstrated that there is a desire amongst critical stakeholders for an impactful global community of practice on *in situ* conservation of PGRFA, a logical next step must entail the formalization of the relationship. The subject matter is highly relevant to the mandate of FAO, an international organization. With several intergovernmental processes, FAO is well-placed to facilitate the establishment of a formal network and could serve as the secretariat of the network.

29. As an immediate next step towards the establishment and operationalization of the Global Network on *in situ* conservation of PGRFA, it is proposed that an inaugural meeting be held immediately prior to the Tenth Session of the Working Group in 2020 (see indicative budget in Table 1). The objective of this inaugural meeting would be to decide on the goals and functions, governance, structure, management, partnerships, funding and a first programme of work of the global network. These decisions ought to be taken jointly by those who decide to contribute to, and to be part of, the network.

30. An important outcome of the inaugural meeting could be the setting up of a 'convening committee' that could translate the discussions at the meeting into concrete outputs, such as goals, structure, governance and funding mechanisms.

31. An initial "community of practice" could be set up as a common platform where information, lessons, tools and methodologies can be disseminated. A "community of practice" may also be convened around one or several multistakeholder projects. As a managed coalition of interrelated entities, network members would cooperate and collaborate on the basis of common objectives and agreed functions and activities of the network. Resources and capacity should be available for activities such as planning, communications, travel, meetings, network publications – such as newsletters and meeting reports – and resource mobilization, including through the preparation of successful funding proposals for suitable donors.

32. Ultimately, the desired structure of the global network would be shaped, *inter alia*, by its formal status as agreed by its constituents. However, at this stage, it is assumed that the network would, at least initially, not have any formal legal status. It would be essential to involve the widest spectrum of relevant stakeholders from the outset in devising the modalities for the global network. Stakeholders should include governmental as well as non-governmental organizations, indigenous and local communities, civil society organizations, international organizations, the private sector and members of existing national and regional networks involved in on-farm conservation of CWR and wild food plants. In this regard, FAO should, through its usual mechanisms, advertise the call for the establishment of the network and invite all interested stakeholders to participate.