CPGR-6/95/10

April 1995

منظمة الأغذية والزراعة للأمم المتحدة | 联合国粮食及农业组织 | Food and Agriculture Organization of the United Nations | Organisation des Nations Unies pour l'alimentation et l'agriculture | Organización de las Naciones Unidas para la Agricultura y la Alimentación

Item 7 of the Provisional Agenda

COMMISSION ON PLANT GENETIC RESOURCES

Sixth Session

Rome, 19 - 30 June 1995

OUTLINE OF THE REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES

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OUTLINE OF THE REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES

I. INTRODUCTION

1. The FAO Conference, at its Twenty-sixth session, agreed that a first Report on the State of the World's Plant Genetic Resources for Food and Agriculture should be developed. At its Twenty-seventh session, the Conference agreed that this should be done through a country-driven process in preparation for the Fourth International Technical Conference on Plant Genetic Resources, which will be held in Leipzig, Germany in June 1996. The Commission on Plant Genetic Resources provides guidance on the preparatory process. At its first extraordinary session in November 1994, the Commission requested that an outline of the Report be prepared for its consideration at its sixth regular session. This discussion paper has been prepared by the Secretariat in response to that request.

2. The outline presented here provides a framework for the preparation of the Report on the State of the World's Plant Genetic Resources, and provides indicative examples of its possible contents. It is not intended that this outline prejudge the outcome of the country-driven preparatory process. The final form and content of the State of the World on Plant Genetic Resources will depend on *inter alia*: the content of Country Reports on Plant Genetic Resources; sub-regional synthesis reports and the outcome of sub-regional and regional meetings; commissioned studies and scientific consultations; and deliberations of the Commission on Plant Genetic Resources and its Working Group. The Commission is invited to consider this Outline and provide guidance on the approach proposed for the preparation of the Report.

II. BACKGROUND

3. In line with the aims and strategy of the Fourth International Technical Conference for Plant Genetic Resources and its preparatory process, as endorsed by the FAO Conference at its twenty-seventh session in 1993, the Report on the State of the World's Plant Genetic Resources will describe the current situation of plant genetic resources for food and agriculture, at the global level, and identify the gaps and needs for their conservation and sustainable utilization, as well as for emergency situations. The Report will encompass plants of social and economic interest, especially for agriculture and forestry, concentrating on domesticated crop species and their wild relatives, forest species of current or potential economic value, and promising species of plants which could be developed into new crops[1]. In particular, the Report will:

i) assess the present state of genetic diversity, the degree of genetic erosion, and the current coverage and status of *in situ* and *ex situ* conservation, and utilization of plant genetic

resources for food and agriculture. The Report will build upon assessments by country and by sub-region, and, to the extent feasible, by crop group;

ii) identify major constraints to plant genetic resources conservation, utilization and exchange;

iii) evaluate the extent to which collections are used and developed, and identify problems which hinder their full utilization for plant breeding;

iv) assess national and regional capabilities for the conservation and utilization of plant genetic resources for food and agriculture, in terms of human resources, institutional structures and legal mechanisms, and the methodologies employed;

v) examine areas of special interest for the conservation and utilization of plant genetic resources for food and agriculture, such as informatics, new biotechnologies, local technologies, and issues such as on-farm conservation, and the scope for new approaches to plant breeding which would maintain diversity in production systems; and

vi) identify technologies appropriate for meeting the special needs of the developing countries, and assess the current state and pattern of technology transfer in plant genetic resources.

III. NATURE OF THE REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES

4. The Report on the State of the World's Plant Genetic Resources for Food and Agriculture provides the basis for drawing up the Global Plan of Action. It must therefore, as far as possible and feasible, include a full assessment of the state of conservation and utilization of plant genetic resources. This should include an assessment of the value of plant genetic resources for development, an analysis of the causes of loss of plant genetic resources; a survey of the methods and resources available for their conservation and use; and an assessment of capacities to employ such methods and resources.

5. The report should be synthetic, providing a global view of the state of genetic resources at all levels. A static "inventory" approach will be avoided by emphasizing existing problems and emergencies at national, regional and global levels. The report will treat conservation and utilization aspects, as well as the various methods of conservation, in an integrated manner, as far as this is possible and appropriate. This will permit an analysis of the inter-relations between conservation and utilization, including the issues of improving incentives for conservation, overcoming obstacles to using conserved germplasm, and examining the relationship between plant breeding and diversity.

6. It is difficult, at this stage of the preparatory process to put a precise figure on the length of the document. This will depend, in part, on the quality and quantity of information made available during the preparatory process. The size of the document should be guided by two principles: it should be as concise as possible, in order to facilitate wide readership, including by policy makers, whilst being as detailed as necessary to provide a sound factual basis for the Global Plan of Action. Information gathered during the preparatory process, particularly from Country Reports, will also determine the extent to which the Report will be able to cover the whole scope of issues, technologies and activities proposed here. Likewise, the final structure of the Report will, at least to some extent, also depend on the information made available during the preparatory process. Thus the structure and content of the report proposed in this document should be regarded as provisional.

7. The report might be illustrated by text boxes of specific examples and case studies, maps, tables and charts. Additionally, the main synthetic document might be supplemented by annexes, or companion volumes which treat particular regions, sectors, crops and topics in more detail. As well as being issued as a conventional bound report, the document will be made available in computer-readable formats.

8. The Report on the State of the World's Plant Genetic Resources will be a periodical publication. Whilst the first report will provide a general synthesis of the state of plant genetic resources, technological methodologies and capacities, subsequent editions might provide an update on these issues accompanied by a more in-depth study on a thematic or sectoral basis. The periodicity of the report should be assessed.

IV. STRUCTURE OF THE REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES

9. It is proposed to organize the report into four main parts:

- Part I: "State of Diversity" - providing an assessment of the state of conservation, erosion and utilization of plant genetic resources; and an analysis of the underlying processes;
- Part II: "State of the Art" - providing a survey of the state of scientific, technical, legal and other methodologies and tools for the conservation and utilization of plant genetic resources;
- Part III: "State of Capacity" - providing a review of the state of human resources, institutional structures, and capacity to use relevant methodologies and tools, for the conservation and utilization of plant genetic resources, at the (sub-) regional, and global levels;
- Part IV: "Summary and Conclusions" - summarizing and drawing together the main findings of the Report.

10. Each of the three main parts will include an assessment of the gaps and needs for improving the conservation and sustainable utilization of plant genetic resources including an identification of the major constraints to conservation, utilization and exchange, and an evaluation of the extent to which plant genetic resources are used and developed, identifying in particular problems which hinder their full utilization for plant breeding.

11. An executive summary will also be provided.

V. CONTENT OF THE REPORT ON THE STATE OF THE WORLD'S PLANT GENETIC RESOURCES

Part I: "State of Diversity"

12. This first part will describe plant genetic resources and their use, assess the value of genetic resources and of genetic diversity *per se*, the present state of genetic diversity *in situ*, conservation of genetic resources *ex situ*, the degree of genetic erosion, and the effectiveness of utilization including through plant breeding. These assessments will be made by crop group, and for the main centres of diversity, as feasible. They will be illustrated by text boxes on case studies or specific examples, maps and tables.

13. The main sources of information for this section will be existing background information, including data in the World Information System on Plant Genetic Resources, assessments by specialists drawing in particular upon expertise in the International Agricultural Research Centres (IARCs) as well as in other inter-governmental and non-governmental organizations, complemented by commissioned thematic studies, Country Reports and Sub-regional Synthesis reports.

14. Possible section headings or elements for this part are, *inter alia*:

- introduction to PGRFA and to plant genetic diversity;
- where PGRFA are located;
- uses of PGRFA;
- value of PGRFA;
- the state of conservation *in situ* and *ex situ*;
- genetic erosion *in situ* and *ex situ* and its implications (for farmers, breeders, food security);
- analysis of the forces promoting conservation and those promoting loss of PGRFA (technical, socio-economic and policy reasons, as well as natural and human-induced disasters);
- costs and benefits of PGRFA conservation and use; appropriation of the benefits derived from PGRFA.

15. In summary, this section will provide a "Description of The Problem" of PGRFA conservation and use and help to identify both the tools (methodologies, policies, resources) needed to address the problem, and gaps in knowledge and understanding which need to be addressed through research. These issues will be taken up in Part IV.

Part II: "State of the Art"

16. This part will briefly survey scientific, technical and other methodologies and tools for the conservation and utilization of plant genetic resources with particular emphasis on technologies appropriate for meeting the special needs of the developing countries. It will examine areas of special interest to the conservation and utilization of plant genetic resources for food and agriculture, such as informatics, new biotechnologies, local technologies, seed production, distribution and regulation, and approaches to plant breeding which maintain diversity in production systems. Given that much information on methodologies is available in other publications, this part will aim to provide a succinct overview rather than a comprehensive review.

17. The main sources of information for this part will be assessments by specialists drawing in particular upon expertise in the International Agricultural Research Centres (IARCs) as well as other inter-governmental and non-governmental organizations, complemented by commissioned thematic studies.

18. Possible section headings or elements for this part are, *inter alia:* assessments of:

- methods for assessing genetic diversity, genetic erosion and crop vulnerability, including biotechnological, taxonomic and ethno-botanical approaches;
- the state of the art of *in situ* conservation, including on-farm approaches;
- technologies for *ex situ* conservation including cryopreservation, ultra-drying, traditional technologies, low-cost methods;
- technologies for characterization and evaluation of germplasm;
- documentation systems and informatics; geographical information systems (GIS);
- approaches to plant breeding, with particular emphasis on approaches which allow the greater use and maintenance of genetic diversity;
- mechanisms for economic valuation of genetic resources/diversity ;
- legal and other mechanisms for rewarding innovation, rewarding conservation and sharing or appropriating benefits.

19. In summary, this section will provide an overview of tools (methodologies, policies, resources) available to address the problem and thereby identify gaps which need to be addressed through research and development. These issues will be taken up in Part IV.

Part III: "State of Capacity"

20. This part will survey the state of human resources, institutional structures, and capacity to use relevant methodologies and tools for the conservation and utilization of plant genetic resources, at the community, national, sub-regional, and global levels. It will include identification of the actors involved in PGR conservation and utilization and an analysis of present funding of these activities, including, where feasible, identification of sources (national governments, private, NGOs and community organizations, bilateral aid, multilateral aid).

21. The main sources of information for this part will be the Country Reports, complemented by the sub-regional synthesis reports and existing information, including that held within the World Information System on Plant Genetic Resources, together with reports from the CGIAR centres, development agencies, funds and banks, and bilateral aid programmes[2].

22. Possible section headings or elements for this part are, *inter alia:*

a) Assessments of national capacities, on a regional or sub-regional basis, illustrated with particular examples by text boxes etc, including:

- human resources, including trained personnel for identifying, collecting, conserving, developing and utilizing PGR;
- institutional structures, including for policy formulation and implementation, research, extension and training;
- support to farmers; farmers organizations, and NGOs;
- germplasm availability; access to collections;
- availability and appropriateness of existing technologies; technology transfer;
- financial resources: quantity and dependability;
- incentive structures;
- national capacities for conservation;
- national capacities for plant breeding (including public, private and voluntary enterprises); and
- national capacities for seed distribution (including public, private and voluntary enterprises).

b) Description of sub-regional, regional and inter-regional cooperation mechanisms, with particular focus on PGR networks.

c) Survey of international programmes for genetic resource conservation and use including specific PGR programmes:

- CGIAR system-wide genetic resources programme and other relevant activities of the IARCs;
- activities of FAO and other UN agencies on PGR conservation;
- Global Environment Facility (GEF) projects on PGR conservation;
- seed production and distribution programmes (as far as they are relevant).

23. In summary, this section will: assess current capacity for plant genetic resources conservation and utilization and thereby identify the need, particularly in developing countries, for capacity building, including training, institution building, policy formulation and technology transfer; identify the need for sub-regional, regional and international cooperation; and identify constraints which should be recognized in the design of methodologies. These issues will be taken up in Part IV.

Part IV: "Summary and Conclusions"

24. Based on the conclusions of each of the three main parts of the Report on the State of the World's Plant Genetic Resources, the following information would be available:

. an assessment of the present state of plant genetic resources/diversity conservation and utilization	from Part I (global perspective), and Part III
. an assessment of the "means" (technological and other methodologies, financial, human/institutional capacities) currently available to address the above	from Part II (methodologies which are which are actually employed)
. an identification of research needs	from Part I (concepts, knowledge and
. capacity building required including training and technology transfer	from Part III

25. The latter two items would be costed through the Global Plan of Action and compared with actual expenditures as far as this information is available and can be provided in the Report. The recommendations in the Global Plan of Action would be developed from the information in the Report on the State of the World's Plant Genetic Resources.

[1] However, at the First Extraordinary Session of the Commission on Plant Genetic Resources, in 1994, some countries felt that the report should not include forest species.

[2] The Commission on Plant Genetic Resources has requested that relevant development agencies, funds and banks provide reports on their activities related to the conservation and use of PGR. At its first extraordinary session in 1994, the Commission also suggested that developed countries be asked to provide information on the impact of their aid programmes on genetic resource conservation and use, with particular emphasis on agricultural development projects and programmes.