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REPORT OF THE JOINT CBD SECRETARIAT - FAO WORKSHOP ON FARMING SYSTEMS APPROACHES FOR THE CONSERVATION AND SUSTAINABLE USE OF AGRICULTURAL BIOLOGICAL DIVERSITY AND AGRO-ECOSYSTEMS

19-20 June 1997, Rome, Italy

SBSTTA is herewith provided with the report of the technical workshop organised jointly by the CBD Secretariat and FAO and supported by the Government of the Netherlands.

Attention is drawn to this information document under Item 6 of the Provisional Agenda of the Third Meeting of the Subsidiary Body of Scientific, Technical and Technological Advice (SBSTTA).

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FARMING SYSTEMS APPROACHES FOR THE SUSTAINABLE USE AND CONSERVATION OF AGRICULTURAL BIODIVERSITY AND AGRO-ECOSYSTEMS

A Technical Workshop organized jointly by
The Food and Agriculture Organization of the United Nations and
The Secretariat to the Convention on Biological Diversity
with the support of the Government of the Netherlands
19-20 June 1997
Queen Juliana Room, FAO – Rome

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In addition, the Editor would like to thank the many participants at the Workshop who contributed written submissions, took notes, summarized sessions and commented on the various drafts of this report. While the Editor has attempted to incorporate all points made and every suggested change to the report, there will be some omissions or misinterpretations, for which he apologises.

31 July 1997

TABLE OF CONTENTS

Technical Workshop on Farming Systems Approaches for the Sustainable Use and Conservation of Agricultural Biodiversity and Agro-Ecosystems, Queen Juliana Room, FAO Headquarters, Rome, 19-20 June 1997

Final Report July 1997

EXECUTIVE SUMMARY AND CONCLUSIONS

EXECUTIVE SUMMARY

1. This Technical Workshop provided the opportunity for the CBD Secretariat, FAO and IPGRI, together with representatives of the Government of the Netherlands, to consider how to address agricultural biodiversity[1] in an integrated and holistic manner. This involved consideration of different levels of agricultural biodiversity (ecosystems, species and genetic levels), and different sectors and sub-sectors (crop and wild plants, domestic and wild animals, insects, forestry and fisheries genetic resources and microbial organisms). The Workshop also considered cross-cutting issues, such as information exchange (the Clearing-house Mechanism - CHM), incentive measures, benefit sharing, access to genetic resources, financial mechanisms, as well as concerns of indigenous peoples, etc. These discussions were held in the context of, and with reference to, the Convention on Biological Diversity's (CBD) Conference of the Parties (COP) Decision III/11 on the Conservation and Sustainable Use of Agricultural Biological Diversity, and other relevant decisions of the COP, the Rome Declaration and the commitments of the World Food Summit (WFS, PoA), the recommendations of the Commission on Genetic Resources for Food and Agriculture (CGRFA) and the Leipzig Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (GPA).

2. Ideas were shared on the impacts (positive and negative) of trends in agriculture on agricultural biodiversity, and constraints and opportunities for the conservation and sustainable use of agricultural biodiversity, and the equitable sharing of benefits, at different levels. Examples were exchanged of integrated multi-dimensional and multi-disciplinary approaches, in terms of policies, programmes and actions. This led to discussions on appropriate mechanisms and actions at national and international levels including information and public awareness, as well as, legal, economic and policy

[1] *NB Agricultural Biodiversity or agricultural biological diversity, in the terminology of FAO, includes activities in the fields of agriculture, animal husbandry, fisheries and forestry (incl. the management of wildlife and Protected Areas).*

measures to address the farming systems and ecosystems dimensions of agricultural biodiversity, both within FAO and with other partners, at all levels.

3. In addition to sharing of ideas, experiences and lessons learnt, the Technical Workshop further developed recommendations for actions addressing the above issues, in three areas: i) Increasing information and awareness; ii) Support to Governments; and iii) International level coordination. These actions take into consideration the broadened mandate and recent recommendations of the CGRFA, and the scope of activities described in COP Decision III/11. They also build on the priority activity areas of the GPA. An important conclusion was that the CBD, particularly through its emphasis on the ecosystem level of agricultural biodiversity, offers a challenge for developing sustainable agricultural systems at the national and local level. In this context, it was recognized that more attention should be given to understanding and enhancing the genetic variety, within and between harvested and non-harvested plant, animal and microbial species. Also, more attention should be given to enhancing the complementary and synergetic relationships between species, and the sustainability, as well as the productivity (which has hitherto received more attention), of agro-ecosystems. This implies that a range of best practices should be identified and made available, with a view to their further development in an integrated manner in specific local situations. It was stressed, however, that an integrated approach must build on and complement sectoral activities. An integrated approach can promote better understanding of how the different disciplines perceive agricultural biodiversity and how they could contribute to sustainable agriculture, and needs to lead to improved collaboration between the disciplines.

Recommendations For Actions

i) It was proposed that increased information and awareness could be achieved through the dissemination of case studies; documenting and setting up a data retrieval system of existing knowledge and literature; surveying ongoing (field) work (identification, testing and appraisal of results) and making an analysis and objective comparison of systems of production with regard to agricultural biodiversity conservation and sustainable use. Policy and technical issue papers and training could be developed on the basis of these findings.

ii) At the national level, the conclusions focused on the mechanisms and processes needed to support countries. For example, a) the provision of guidance for conducting and harmonizing assessments of resources and of relevant sectoral and cross-sectoral capacities and priorities; b) the identification and enhancement of relevant legal instruments and mechanisms; and c) the identification of areas of focus in order to determine priorities for programmes and action plans for the conservation and sustainable use of agricultural biodiversity at all levels and across all sectors. The need to set up mechanism for improved coordination between different national focal points for the range of international Conventions, Commissions and agreements (for example: the CGRFA, FAO, COP-CBD, GEF, WTO-CTE, and so on) was emphasized. There was consensus that an initial objective must be to encourage different sectors to meet and agree on the need to collaborate and establish mechanisms to ensure that agricultural biodiversity is properly incorporated into national instruments, for example, National Environmental Action Plans (NEAPs),

National Biodiversity Strategies, National Agricultural Strategies and Plans and National Forestry Action Plans.

iii) At the international level, the meeting concluded that support to countries, in the identification, assessment and development of strategies and programmes, should be coordinated. In particular, that the COP should be asked to contribute ideas to the CGRFA on the scope of the next country-driven global assessment of genetic resources as a follow-up to the first report on the State of the World's Plant Genetic Resources for Food and Agriculture. This will require the development of agreed criteria and indicators and will need coordinated inputs by many different actors, including all relevant government departments, research institutes, farmers' groups and NGOs. FAO and CBD agreed to strengthen cooperation on the conservation and sustainable use of agricultural biodiversity, and will take various initiatives, through consultation and information exchange among others, in order to develop a joint work programme. In this process other relevant international organizations, such as the World Bank, UNEP, UNESCO, IPGRI, etc. will be invited to make their contribution. It was also recommended that there should be international cooperation on, and coordination of, approaches to funding agencies including the GEF to ensure adequate resourcing for the development and implementation of the multi-year programme of activities on agricultural biological diversity and the mechanisms needed for its development.

CONCLUSIONS OF THE WORKSHOP

4. The outcome of the Technical Workshop was a set of conclusions about actions needed in three areas in order to achieve integrated work on agricultural biodiversity: Increasing information and awareness; Support to Governments; and International level coordination. These actions took into account the three objectives of the Convention and the need for activities in relation to agricultural biodiversity on: i) assessment and monitoring, ii) conservation and sustainable use, and iii) economic and legal aspects. It also built on the priority activity areas of the GPA, in the context of the broadened mandate and recent recommendations of the CGRFA, as well as the scope of COP Decision III/11.

Increased information and awareness (see Table I)

5. Appropriate information should be prepared and directed to policy decision makers, technical staff, relevant institutions and local users of agricultural biodiversity including producers and consumers and, in particular, should identify opportunities for relevant work. The information could be in the form of:

- **Case studies**, documenting existing literature, developing inventories, surveying ongoing (field) work and making an analysis and objective comparison of systems of production with regard to agricultural biodiversity conservation and sustainable use and relevant economic and legal aspects.

- **Policy position papers**, derived from this information and from other relevant research, should be directed to the COP and CGRFA.

- **Technical issue papers and training** could also be developed by FAO, CBD, CGIAR, among others, and provided to Governments, Parties to the CBD and Member Nations of FAO. These could include information about the importance of, and methods for, developing appropriate indicators to measure, *inter alia*, contributions and threats to agricultural biodiversity as well as performance of activities and measures implemented under COP Decision III/11.

6. **Electronic and conventional media** should be used to share information, including e-mail conferences, where appropriate, and through conferences and workshops at all levels.

   Increased public awareness raising could focus around, for example, importance and specificities of agricultural biodiversity, marketing plans for the use of a wider range of agricultural biodiversity, and campaigns to highlight nutritional, cultural and aesthetic food qualities.

Support to Governments - Guidance at National Level (see Table II)

7. **Supporting systems approaches to the conservation and sustainable use of agricultural biodiversity**, and the process for achieving this, were considered by participants in the context of how to address national and sectoral interests and local needs; the phasing of work identified in Decision III/11 para. 1, the thematic areas listed in Annex 2 and the Case Studies in Annex 3 of that Decision. These approaches should include **explicitly incorporating agricultural biodiversity conservation and sustainable use** in, for example, National Biodiversity Strategies (at agro-ecosystem levels), National Environmental Action Plans, national agricultural development plans and National Forest Action Programmes.

8. **The mechanisms and processes needed to determine priorities** for programmes and plans and to support countries in this process were discussed and the following conclusions were arrived at.

- **Guidelines for assessments should be developed** for, for example:
  - Agricultural biodiversity at all levels (agro-ecosystem, species and genetic) and the positive and negative impact of agricultural practices on this;
  - Relevant sectoral and cross-sectoral capacities and priorities;
  - The identification of relevant legal instruments and mechanisms; and
  - The areas of focus required for the implementation of activities.
- **An outline framework and process for providing guidance to governments**, for addressing agricultural biodiversity at a national level, and within this, at agro-ecosystems levels needs to be developed. This could be carried out as part of the CBD and FAO collaboration**,** with the assistance of other organizations such as IPGRI. It could provide ideas regarding locally-relevant definitions and scope of agricultural biodiversity and agro-ecosystems, and further recommend a process for moving forward in an integrated way, ensuring collaboration between environment and agricultural sectors and sub-sectors, taking into account ongoing processes and responding as well to action plans such as the GPA, and so on.
- **Improved coordination between different national focal points** could also be achieved through this mechanism. There was consensus that an initial requirement is to encourage different sectors and focal points to meet and agree, not only on the need to collaborate and but also on the development and implementation of integrated programmes of activities. An appropriate mechanism could be through meetings of formal and informal sector organizations at regional, sub-regional or national levels.
- **National level platforms are required** to enhance effective coordination between all relevant focal points in all the relevant ministries and agencies, as well as with other actors. The CSD/Agenda 21 mechanisms could also be utilized as a possible entry point to enhance collaboration between sectors, although this should not dilute the attention to agricultural biodiversity as a key entity in its own right. It was also agreed that National Biodiversity Strategies and Programmes need to take account of the specific and distinctive nature of agricultural biological diversity, not only at agro-ecosystems levels but also at species and genetic levels.

International Coordination (see Table III)

9. **FAO and CBD**, as leading partners in agricultural biodiversity conservation through sustainable utilization, are taking the initiative for **further cooperation** and are inviting other relevant organizations to join in this process. This was fully supported by all participants.

10. **Mutual reporting between the governing bodies of the COP and the CGRFA** should continue at all relevant meetings as well as the development of **general mechanisms for cooperation** between CBD and FAO Secretariats. These should continue to be discussed and monitored through meetings twice each year. Other exchanges of relevant information on ongoing projects and programmes and the systematization of documentation and experiences between the two bodies, should be formalized. Such exchanges of information should lead to greater harmonization of programming and the involvement of other relevant organizations, wherever possible.

11. **Support to Governments by FAO and CBD should be coordinated**. Among many potential activities it was noted that there is a particular opportunity in the development of the next country-driven global assessment of genetic resources. The COP should contribute ideas to the CGRFA on the scope of this assessment. It was also noted that such an activity would contribute to the implementation of Decision III/21[2].

12. **Country-driven global assessment,** as described above, could be widened eventually to become the State of the World's Genetic Resources for Food and Agriculture, including all agricultural biodiversity, in so far as this is possible, and based on agreed indicators, mechanisms for the development of which are urgently needed. It was felt that this process might also assist in **the development and coordination of national Focal Points** as well as in the development of agreed national policies, plans and programmes, and the development of regional resource networks, within a globally agreed framework. This will need the coordinated input of many different actors, including all relevant government departments, farmers' groups and NGOs. The development of regional resource networks might be assisted through the **participation of all relevant actors in regional and sub-regional meetings.**

13. In the evolution of the CBD **Clearing-house Mechanism** (CHM) with respect to agricultural biodiversity, it was concluded that care should be taken to ensure **cooperation and complementarity** especially with existing information systems, particularly those maintained by FAO, a lead agency for agricultural information. Among others, these include:

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[2] *Decision III/21: The Conference of the Parties requests the Executive Secretary to continue to coordinate with the secretariats of relevant biological diversity-related conventions, institutions, and processes, with a view to: facilitating the exchange of information and experience; exploring the possibility of recommending procedures for harmonizing, to the extent desirable and practicable, the reporting requirements of Parties under those instruments and conventions; exploring the possibility of coordinating their respective programmes of work; and consulting on how such conventions and other international legal instruments can contribute to the implementation of the provisions of the Convention on Biological Diversity.*

- **WIEWS** on plant genetic resources developed and maintained by FAO;
- **CROPINFO**, now under development, is an integrated crop information and management support system built upon FAO and other databases and including WIEWS, SIS (Seed Information System), FAOSTAT, CHD (Crop Husbandry Database), ECOCROP (Crop Environmental Requirements Database), Digital Soil Map of the World, and so on;
- **REFORGEN** global forest genetic resources information system, housed in and maintained by the Forestry Department;
- **DAD-IS** Domestic Animal Diversity Information System maintained by the Agriculture Department;
- **FishBase** a collaboration between the Fisheries Department and ICLARM.

In this regard, it was recommended that the CBD Secretariat should be invited to participate in the **planned review of the WIEWS**. It was noted that the CBD Secretariat would be organizing a **series of regional workshops** on the Clearing-house Mechanism in the second half of 1997. Likewise, **regional consultations** organized by different sectors, for example on the Global Strategy for the Management of Farm Animal Genetic Resources, could be utilized to further consider **mechanisms for interlinking information and assessment and reporting**.

14. **International cooperation on, and coordination of, approaches to funding agencies** including the GEF should be enhanced. This should ensure adequate resourcing for the multi-year programme of work on agricultural biological diversity and the mechanisms needed to develop it. Recognizing the decisions of the COP - Decision III/5: Additional Guidance to the Financial Mechanism, and Decision III/6: Additional Financial Resources which, *inter alia*, urges all funding institutions, including bilateral and multilateral donors as well as regional funding institutions and non-governmental organizations, to strive to make their activities more supportive of the Convention, it was also concluded that stakeholder meetings should be organized between CBD, FAO and donors in order to increase awareness and develop ideas between the various partners. In these discussions, existing financial resources, as well as the existing programmes of various international organizations, should also be taken into account.

SUMMING-UP

15. The Workshop participants agreed that:

- Humankind is going to have to utilize sustainably every type of agricultural biodiversity at all levels, genetic, species and agro-ecosystem, if, as is required for universal food security, sustainable food production is to be achieved across the whole range of production environments.

- To achieve this will require the implementation of existing and new intergovernmental processes in order to stimulate national level activities for enhancing the conservation of agricultural biodiversity through its sustainable use within agro-ecosystems as well as at species and genetic levels.

- All relevant organizations, institutions and individuals, from policy makers to producers, will need to be actively involved, through the provision of knowledge, expertise and resources. This should ensure implementation of activities under Decision III/11 (and other relevant decisions of the COP) as well as other relevant mechanisms such as the World Food Summit Plan of Action, the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture and other sectoral strategies, plans, programmes, codes of conduct and so on, covering farm animals, forestry, fisheries, and so on.

- The development of the joint FAO-CBD programme of work is an important and positive development and should give a powerful signal to the international community and to national level institutions.

- This programme of work will need to build on and complement established sectoral activities, promoting a better understanding of how different disciplines can work together.

- Through the agreed activities of this joint programme, participants at the Workshop agreed that significant progress will be made in the development of mechanisms and processes to operationalize the multi-year programme of activities on the conservation and sustainable use of agricultural biological diversity, at local, national and international levels.

Table I: Increasing Information and Awareness

PROPOSED ACTIONS	TIMING	PARTNERS	CONSIDERATIONS, RISKS AND CONSTRAINTS
Developing case studies on appropriate integrated systems approaches Documenting existing literature Survey ongoing field work (Fair comparison of systems) New action/research field programmes	Now, as possible within resource constraints	FAO/CGIAR/ NGO/GBF/ NAR	Availability of scarce resources Benefits/costs?
Developing policy/position papers/guidelines on key issues, approaches and methods		COP/CGRFA	Resources
Technical papers/training		SBSTTA/FAO/CGIAR	Identification of local 'champions'
Developing other media e.g., Internet		CHM	Access
Conferences/workshops all levels to involve all actors		FAO and others	Ability to raise awareness
Marketing plan/campaign highlight nutrition and aesthetic qualities		Industry/Min Ag/ Consumer groups/ NGOs	Consumer disinterest Growers marginalized

Table II: Support to Governments - Guidance at National Level

PROPOSED ACTIONS	TIMING	PARTNERS	CONSIDERATIONS, RISKS AND CONSTRAINTS
REVIEW BY COUNTRIES - Agree on scope - Inventory relevant sectoral and cross-sectoral activities (e.g. IPM) -Assess status/stage in each sector e.g. assessment, capacities, priorities - Identify relevant legal instruments & mechanisms - Identify areas of focus and determine priorities	COP-IV May 1998	FAO/CBD with UNEP	Institutional/bureaucratic boundaries Timing/phasing
PREPARE PRELIMINARY GUIDANCE or OUTLINE FRAMEWORK AND PROCESS (3-5 pages + annexes) - Definitions (levels and scope) - Initial steps and process for developing national strategies. Programmes and plans on agricultural biodiversity (phasing?)	1st draft As soon as possible	Joint FAO-CBD Lead role FAO in collaboration with IPGRI - an individual to be identified to prepare 1st draft	Time
NATIONAL COORDINATION - Meeting to initiate consultation and coordination between sectoral focal points for each activity (biodiversity, agricultural biodiversity subsectors - Where useful draw on CSD - Agenda 21 mechanisms	as soon as possible	Ministries and governmental bodies: Agriculture, Natural Resources/ Environment, Planning etc.	- wider definition of sectors in biodiversity sense i.e. including land resources -phased or staggered process
REGIONAL MEETINGS - Develop ideas and build consensus building on required process to incorporate agricultural biodiversity in national biodiversity strategies (meetings, linkages etc.)	1 year	Joint FAO-CBD with Regional organizations or mechanisms.	- Preparation process - Funds - Participants - if all sectors and all countries too many
DEVELOPING GUIDELINES - obtain agreement of need for a supplement to existing guidelines or the development of new guidelines - revise or prepare a supplement on agricultural biological diversity	1-2 years	- Use SBSTTA to obtain consensus - FAO lead role for preparation with key agricultural biodiversity partners	Inter-Agency collaboration Political will
ELECTRONIC MEDIA (CHM and E-MAIL CONFERENCES) -to raise awareness and understanding of importance and scope of agricultural biodiversity - to strengthen national focal points and networks in the management of genetic resources	2 years	FAO/CBD	Time
GUIDELINES FOR ASSESSMENT - Including indicators for adapted genetic resources	1 year	FAO/UNEP/IUCN/ WMCM etc	Involvement of actors. Cost/time of surveys/ assessments Agreed terms/ units
NATIONAL PLATFORM	To be set up on a permanent basis	GOs, NGOs Producers and farmers Private sector Academic and research institutes etc.	Depends on results of regional meetings and preliminary national meetings

Table III: International Level Coordination

PROPOSED ACTIONS	TIMING	PARTNERS	CONSIDERATIONS RISKS AND CONSTRAINTS
Mutual reporting between CGRFA and COP governing bodies	Ongoing	FAO/CGRFA/COP/ SBSTTA	Permanent agenda item required
Develop general mechanisms for cooperation between Secretariats (for specific and technical consultations) Exchange information ongoing projects /programmes and systematize documentation and experiences	Twice a year Immediate; step wise implement-ation	CBD, FAO & other relevant organizations	Timing
Harmonize programming wherever possible		FAO and CBD in close cooperation with other relevant institutions	
Assessments (reporting of countries, international organizations) One concrete proposal: exploring SOW II on agricultural biodiversity in general? (country-driven assessment)	next few months	FAO and CBD in close cooperation with other relevant institutions	Governments agree on scope and timing
Information systems/CHM - aim to ensure cooperation/ complementarity - review WIEWS on PGR	immediate Oct/Nov '97	CBD/FAO FAO, CBD, WB, IPGRI and others e.g. NGOs	FAO is lead agency for agricultural information links of WIEWS with CHM
Development of agreed indicators: agriculture, livestock, fisheries, forestry		FAO, CBD	Governments decide
Focal point coordination may result from SoW on agricultural biodiversity (country-driven process)		CBD, FAO	Agreement to coordinate within Governments, Member Nations and Parties to the CBD
Cooperation on funding - follow-up discussions FAO/CBD - FAO communication to Member Nations on Decision III/11	in next few months	CBD, FAO FAO	Availability of resources for Agricultural Biodiversity

Farming Systems Approaches for the Sustainable Use and Conservation of Agricultural Biodiversity and Agro-Ecosystems

A Technical Workshop organized jointly by the Food and Agriculture Organization of the United Nations (FAO) and the Secretariat to the Convention on Biological Diversity (CBD Secretariat), with the support of the Government of the Netherlands

19-20 June 1997, Queen Juliana Room, FAO Headquarters, Rome

Introduction

16. The Technical Workshop, initiated by the Government of the Netherlands, was held at the end of a series of consultations between the CBD Secretariat and FAO Technical Departments and Legal Office, coordinated by FAO's Sustainable Development Department. The purpose of the week was to discuss possible contributions to, and to initiate the development of a joint programme of work between FAO and the CBD Secretariat, in particular, to develop joint plans for the operationalization of the multi-year programme of activities on agricultural biological diversity agreed to by the Third Meeting of the Conference of the Parties to the Convention on Biological Diversity COP-III (UNEP/CBD/COP/3/38; Decision III/11, para. 1). Considerations were based on this Decision III/11 and drew upon other relevant decisions of the COP and recommendations of the SBSTTA, as appropriate[3]. They also took into account the upcoming discussions at SBSTTA-III and COP-IV on Inland Waters, as well as the cross-cutting issues, such as information exchange (the Clearing-house Mechanism - CHM), incentive measures, benefit sharing, access to genetic resources, financial mechanisms, as well as concerns of indigenous peoples, etc.

17. The outcomes of the week's discussions included a draft Memorandum of Cooperation between FAO and the CBD Secretariat (UNEP/CBD/SBSTTA/3/Inf.20) and an *Aide Memoire* signed by FAO, the CBD Secretariat and the Government of the Netherlands (see Annex 1) **Towards a framework for integrated action on agro-biodiversity**, which states, *inter alia*:

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[3] *especially those that relate to marine coastal biological diversity (Decision II/10: Conservation and Sustainable Use of Marine and Coastal Biological Diversity, and its Annexes), forest biological diversity (Decision III/12: Programme of Work for Terrestrial Biological Diversity: Forest Biological Diversity) and future work programmes on terrestrial biological diversity (Decision III/13. Future Programme of Work for Terrestrial Biological Diversity: Dryland, Mountain and Inland Water Ecosystems).*

Agree that one of their main priorities [of FAO and the CBD] will be the development and implementation of an integrated Work Programme on Agro-biodiversity, plans for the development of which will be made available for information during the FAO Conference in 1997 and during the Fourth Conference of the Parties to the Convention on Biological Diversity in 1998 (COP-IV); Underline the importance for FAO and the CBD-Secretariat to initiate the development of the appropriate institutional mechanism for implementation of this work programme, taking into account existing systems and networks; Will promote active participation in the implementation of the Work Programme on Agro-biodiversity of governments, intergovernmental institutions, non-governmental organizations and the private sector.

18. The Technical Workshop developed one particular aspect of these discussions, namely, to look at the contribution of holistic and integrated approaches, such as farming systems approaches, to the conservation and sustainable use of agricultural biological diversity and agro-ecosystems, particularly by rural communities and the smallholder-farming sector. It was designed as a 'brainstorming session' in which many ideas could be openly explored and discussed. Through presentations of ongoing activities, group and plenary discussions, participants came to a series of conclusions about a **programme development process,** including the approaches, processes and components of an integrated programme of activities, which would further the agricultural biodiversity Decision (COP III/11). These conclusions were considered by participants to be worthy of further attention in the process of the further development of programmes of activities by FAO and CBD Secretariat, and may help inform the thinking of Governments - both Parties to the Convention and Member Nations of FAO. The proposals put forward, as conclusions of the Workshop, require further consideration and discussion and decisions will need to be made, as appropriate by the participating bodies in consultation with Governments, Parties to the CBD and Member Nations of FAO.

Aim of the Workshop

19. The aim of the joint CBD Secretariat - FAO Workshop was to explore the development of integrated, holistic farming systems approaches for promoting the conservation and sustainable use of agricultural biological diversity with particular attention to rural communities and the smallholder-farming sector. The results of the Workshop were expected to contribute to the further development by the CBD Secretariat and FAO of a joint work programme on agricultural biodiversity for food and agriculture, which will strengthen policy and technical support to Governments, Member Nations of FAO and Parties to the CBD.

20. **Objectives**

a) To review the agricultural biodiversity programmes and priorities of FAO and the CBD Secretariat;

b) To identify areas and approaches requiring further attention and support with a view to assisting Governments in implementing the Convention on Biological Diversity (CBD) in the context of:

- the FAO Plan of Action of the World Food Summit (WFS-PoA)
- the expanded mandate of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) and in response to
- the decisions adopted by the Third Meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-III), as these relate to food and agriculture (especially Decision III/11); and thereby;

c) To develop a framework for an integrated agricultural biodiversity programme aimed at promoting sustainable farm livelihood systems and sustainable agro-ecosystems that respond to the three objectives of the Convention on Biological Diversity, namely:

- the conservation of [agricultural] biological diversity
- the sustainable use of its components and the
- fair and equitable sharing of benefits arising out of the use of genetic resources [of actual or potential value for food and agriculture].

Particular emphasis was placed on the needs of rural communities and the smallholder-farming sector and the use of farming (production) systems and agro-ecosystems approaches.

(The Workshop Timetable is attached as Annex 2.)

Context

21. The focus of discussions during the Technical Workshop was COP-III Decision III/11 "Conservation and Sustainable Use of Agricultural Biological Diversity" and its annexes. Other relevant Articles and decisions of the COP, relating to, for example, terrestrial biodiversity which addresses forestry[4], mountain, dryland and inland waters biodiversity, the Clearing-house Mechanism, identification and monitoring, incentive measures, access to genetic resources and technology, the implementation of Article 8(j), as well as financial mechanism (noting that the Global Environment Facility is the interim financial mechanism), were also considered.

22. Furthermore, the Workshop discussions were placed in the context of the Rome Declaration, the commitments of the World Food Summit Plan of Action (WFS, PoA, especially Commitment 3 on sustainable food production), and the recommendations of the 112th FAO Council and its adoption of the report of the 7th Session of the Commission of Genetic Resources for Food and Agriculture (CGRFA) in May 1997. The latter included the agreement to establish two intergovernmental technical working groups on plant and on animal genetic resources for food and agriculture, respectively. Discussion also took account of the Leipzig Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (GPA), and other sectoral strategies, plans, programmes, codes of conduct covering farm animals, forestry, fisheries, and so on. In this respect, the Workshop recognised this established sectoral work supported by FAO and therefore considered it important to focus on complementary system-level and cross-sectoral approaches to agricultural biodiversity conservation through sustainable use, as this is less well developed conceptually. The Workshop drew on examples of FAO work such as farming systems, integrated pest management and aquaculture, among others, to illustrate the benefits of systems approaches.

23. The outcomes of the Workshop were intended to make a particular contribution in terms of development of processes and mechanisms for implementing the multi-year programme of activities on agricultural biological diversity (COP III/11 para. 1), which aims to promote:

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[4] *A meeting of a liaison group on forest biological diversity under the CBD was hosted by the Goverment of Finland from 25 to 28 May 1997 in Helsinki. Particpants were selected from a roster of experts nominated by Governments, and FAO was among other UN and non-governmental organisations and bodies represented. The meeting discussed issues related to the conservation and use of forest genetic resources in considerable detail, with special reference to the recommendations in this sector by the SBSTTA; and recommendations related to Terrestrial Ecosystems of the COP (in the case of COP-III, notably recommendation III/12. Specific recommendations were made for priority action, collaboration and coordination of activities between the CBD and other international agencies and institutes, including FAO. The recommendations passed by the Forestry Liaison Group will be drawn to the attention of the forthcoming meeting of the SBSTTA, and to the attention of COP-IV.*

i) the positive effects and mitigate the negative impacts of agricultural practices on biological diversity in agro-ecosystems and their interface with other ecosystems;
ii) the conservation and sustainable use of genetic resources of actual or potential value to food and agriculture;
iii) the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

24. The initiative for the organization of this Workshop was taken by the Government of the Netherlands whose starting point was to try and find ways of effectively linking goals, activities and players involved in national and international policy on agricultural biodiversity, bearing in mind the need for complementarity and synergy. This is considered to be crucial for the implementation of COP Decision III/11. Furthermore the Netherlands think it is essential to develop a coordinated integrated policy at the international level involving FAO, CBD and other relevant international and regional organizations and institutions concerned with the conservation and sustainable use of agricultural biodiversity and sustainable development. It was felt there should be a search for an efficient and selective harmonization of efforts within existing frameworks.

25. The meeting recognized agricultural biological diversity includes primarily all the biological resources needed and utilized for food and agricultural production, comprising plants including 'wild foods', animals including wildlife, insects, fisheries including aquaculture, forestry, microbiota, and so on, at genetic, species and agro-ecosystem levels, taking into account the importance of related, non-harvested, agricultural biodiversity as well as that of harvested species. In addition, it was recognized that agricultural biodiversity encompasses two other components: i) the physical or abiotic environment (soil, water, climate, etc.) as well as ii) the activities and decision of resource users (farmers who may be dependent on, *inter alia*, agricultural crops, forest resources, livestock, as well as herders, and fishers) which are characterized by management practices as well as social, political and economic variables.

26. It was also recognized that genetic resources of actual or potential value to food and agriculture are being lost at an alarming rate, due to habitat destruction and land degradation, over-exploitation of water resources, modern industrial agricultural and forestry practices, urban expansion and as a result of pressures on resources exerted by the rapidly increasing world population. Traditional smallholder agriculture, livestock and fisheries production, where the main objective may not be maximizing yields but rather ensuring yield security, was recognised as a main provider of genetic diversity of crops, which allows, moreover, for continued adaptation to changing environments and needs. In contrast, it was noted that industrial agriculture, based on high inputs and responding to market forces, applies a fundamentally different strategy, adapting the environment to the requirements of certain high-yielding agricultural species, varieties and breeds with a view to providing specific products. It was further noted that the trend from traditional subsistence agriculture to market-driven agriculture often leads to the reduction and minimization of products. However, it was also noted that once the market economy becomes more developed, it may then encourage diversification of products but aimed at specific qualities and market niches.

SHARING INFORMATION AND VIEWS ON AGRICULTURAL BIODIVERSITY (Session 1)

27. The opening presentations noted the positive progress made by FAO and the CBD Secretariat during the earlier part of the week in identifying and developing areas of, and modalities for, collaboration (see UNEP/CBD/SBSTTA/3/20) and also summarized the position of the participants' institutions (FAO, CBD, IPGRI and the Government of the Netherlands). Focus was placed on describing the scope and importance of agricultural biodiversity as a major theme within the CBD (through Decision III/11), its governance and the contributions it makes to sustainable food production and to food security. Issues raised, *inter alia*, included conservation through sustainable use, legal issues, including systems to control the use of the intellectual property or knowledge contained within it, Farmers' Rights and benefit sharing.

28. Given FAO's role and mandate of its substantial involvement in this area, it was recognized that FAO is a lead partner in the implementation of Decision III/11. *Inter alia*, relevant roles and responsibilities include the implementation of existing instruments such as the Leipzig Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. FAO supported a much acclaimed country-driven process for supporting the preparation of national reports by Member Nations of FAO, which were reviewed through sub-regional meetings and presented in the first global report on the State of the World's Plant Genetic Resources for Food and Agriculture. FAO also supports the formulation of medium-term programmes and framework programmes by Member Nations of FAO (most are also the Parties to the CBD). It was highlighted that the existing mechanisms of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA), with its widened mandate, and its, recently agreed, Intergovernmental Technical Working Groups on Plant and Animal Genetic Resources, can make important contributions to the implementation of Decision III/11. Also recognized as a major contribution is the interpretative role of FAO through the CGRFA in, for example, negotiating the revision of the International Undertaking in harmony with the CBD, to be provided, if agreed, by the FAO Conference in 1999 as a possible Protocol to the Convention, as well as FAO's normative and operational roles in the area of agricultural biodiversity.

29. The contributions of other players were also referred to, including the CGIAR, UNESCO, NGOs and the private sector, and the mechanisms for achieving effective collaboration and cooperation. An example was cited of the MoU between the International Plant Genetic Resources Institute (IPGRI) one of the 16 CGIAR centres, and the FAO on programme cooperation. IPGRI also has responsibility for the System-Wide Genetic Resource Programme and the complementary SINGER database, a clearing-house mechanism on genetic resources, as well as programmes for developing *in situ* conservation of genetic resources for food an agriculture through utilization.

30. It was recognized that such initiatives should support the development of an international system for the conservation of agricultural biodiversity through sustainable utilization, to meet needs for improving information exchange and to support countries in developing their own approaches.

SCOPE OF AGRICULTURAL BIOLOGICAL DIVERSITY AND SOME AVAILABLE STRATEGIES AND APPROACHES TO ASSIST GOVERNMENTS IN IMPLEMENTING DECISION III/11 AND OTHER RELEVANT COP DECISIONS (Session 2)

31. Under its Decision III/11 on the "Conservation and Sustainable Use of Agricultural Biological Diversity", the Third Meeting of the COP (Buenos Aires, November 1996), decided to develop **a multi-year programme of activities on agricultural biological diversity** aiming to promote: the positive effects and mitigate the negative impacts of agricultural practices on biological diversity in agro-ecosystems and their interface with other ecosystems; the conservation and sustainable use of genetic resources of actual or potential value for food and agriculture; and the fair and equitable sharing of benefits arising out of the utilization of genetic resources.

32. It is recognized that different agricultural practices lead to diverse impacts upon natural and domestic biodiversity at the ecosystem, species and genetic levels (Decision III/11 Annex 1), notably, that:

    a) unsustainable agricultural practices have caused negative impacts on biological diversity, world-wide and at all levels, including, *inter alia*, degradation of agro-biodiversity and habitats, threats and destruction to the natural resource base and related socio-economic problems through for instance, inappropriate agricultural practices, expansion of agriculture, over-exploitation of natural resources, inappropriate use of chemicals, as well as the loss of the cultural diversity of traditional communities.

    b) agricultural practices have also facilitated enhanced biodiversity as a result of both traditional and modern sustainable farming practices including the provision of habitats in agro-ecosystems, efforts to preserve biological diversity important to agriculture, both *in situ* and *ex situ*, the use of biological diversity-friendly agricultural practices such as land management, use of chemicals, soil and water conservation, crop breeding.

33. Agricultural biological diversity comprises all living organisms that contribute to food and agricultural production. In the terminology of FAO it includes activities in the field of agriculture, animal husbandry, fisheries and forestry including the management of wildlife and protected areas. Some descriptions of "agricultural biological diversity" and "agro-ecosystems" were offered to help Workshop participants understand the scope and dimensions of the subject area and to facilitate the discussions.

    Agricultural biological diversity (or agricultural biodiversity), refers to the variety and variability of animals, plants, and micro-organisms on earth that are important to food and agriculture. It is an important sub-set of biodiversity as it is the basis of food security. It includes all the species used directly or indirectly for food and agriculture, both human nutrition and feed for domestic animals, including non-domesticated or "wild" resources. Thus it covers, *inter alia:* crop and fodder varieties, including trees, domestic animal breeds and wildlife, including fish, mollusc and bird species, insects, fungi, yeasts and micro-organisms such as algae and diverse bacteria. As with biodiversity as a whole, agricultural biodiversity is considered at three levels: genetic

diversity (i.e. variability within species), species diversity (between species) and habitat or ecosystems diversity. The variation results from the interaction between the environment, genetic resources and management (see the definition of agro-ecosystems given below). The different ways land is used for agricultural production is a form of agricultural diversity. Cultural diversity also influences human interactions at all levels.

Agricultural biodiversity has been further described as including[5]:

- harvested crop varieties, livestock breeds, fish species and non-domesticated ('wild') resources within field, forest, rangeland and aquatic ecosystems;
- non-harvested species within production ecosystems that support food provision, including soil micro-organisms, pollinators, and so on; and
- non-harvested species in the wider environment that support food production ecosystems (agricultural, pastoral, forest and aquatic ecosystems).

Agricultural ecosystems (or agro-ecosystems) are those "ecosystems that are used for agriculture" in similar ways, with similar components, similar interactions and functions. Agro-ecosystems are determined by three sets of factors, which exhibit genetic, spatial and temporal variation, and by their interactions:

- **The abiotic or physical/ecological environment** is described by the climate and weather (rainfall, light, temperature, humidity and wind), altitude and topography (slope and orientation); soil quality and fertility (pH, structure, texture, water, nutrient and mineral content); water supply/irrigation; vegetation or land use; and location/access.
- **The agricultural biological/genetic resources** important for food and agriculture which can include the genotypes, cultivars and species of crops, trees, grassland, semi-domesticated and "wild" plants; genotypes, races and breeds of domesticated and wild animals and fish; as well as insects, arthropods, fungi, and micro-organisms, including those that may be beneficial (Rhizobium bacteria, mycorrhiza, earthworms, ants, etc.) and harmful (weeds, nematodes, pests, diseases).
- The agricultural activities and decisions of farmers (including activities related to herding, forestry and fisheries), which are characterized by management practices and socio-cultural variables. **The management practices** include type of cultivation, size of farm, technology and agronomic specifications (cultural practices, inputs and outputs) and economic factors (marketing system, capital and labour intensity, costs and values of inputs and outputs, etc.). The **socio-cultural variables** include population density/pressure, land tenure, knowledge systems and education, government services and policies. The activities and decisions of farmers, foresters, fishers and herders at field, farm and community levels, which modify and use the available resources to achieve certain production and management goals, are taken in an agro-ecological and socio-economic context and are influenced by the decisions of policy makers and governments.

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[5] *Using, inter alia, Biodiversity, its Conservation and Use for Sustainable Agricultural, Forestry and Fisheries Development, FAO, 1990; The den Bosch Declaration and Agenda for Action on SARD, FAO, 1991; Biodiversity for Sustainable Agriculture and Rural Development, FAO, 1994; Global Biodiversity Forum, Buenos Aires, 1996, etc.*

Agro-ecosystems may be identified at different levels or scales, i.e. a field/plot/crop/herd, a farming system, a land-use system, a watershed or an agro-ecological zone. These can be aggregated to form a hierarchy of agro-ecosystems. Valuable ecological processes, that result from the interactions between species and between species and the environment include, *inter alia*: biochemical recycling, the maintenance of soil fertility and water quality, climate regulation i.e. micro-climates caused by different types and density of vegetation. Moreover, the interaction between the environment, genetic resources and management practices determines the evolutionary process which may involve, for instance, introgression from wild relatives, hybridization between cultivars, mutations, and natural and human selections. These result in genetic material (landraces or animal breeds) that is well adapted to the local abiotic and biotic environmental variation.

34. The conservation and sustainable use of agricultural biological diversity is key to improving agricultural productivity and sustainability and it can also contribute to socio-economic development, food security and poverty alleviation. Its sustainable use requires an understanding and careful management of the inter-relationships of all relevant species, varieties and breeds at all scales of ecosystems as well as their inter-relationships with the physical environment and ecological processes. However, the conservation and sustainable use of agricultural biological diversity, as described above, is extremely complex as it addresses many sectors and sub-sectors, requires attention to many scales of ecosystems and levels of biological diversity and involves many levels of intervention and interactions.

35. In this context attention was drawn to the complexity and implications of Decision III/11, and other relevant decisions, regarding actions to be conducted by Parties at national level.

As a major objective, in line with paragraph 1, Decision III/11, Parties are encouraged (para. 17) with the support of international/regional organizations, to:

- Promote the transformation of unsustainable agricultural practices into sustainable production practices adapted to local biotic and abiotic conditions, in conformity with the ecosystem or integrated land-use approach;
- Promote the use of farming practices that not only increase productivity, but also arrest degradation as well as reclaim, rehabilitate, restore and enhance biological diversity;
- Promote the mobilization of farming communities including indigenous and local communities for the development, maintenance and use of their knowledge and practices in the conservation and sustainable use of biological diversity in the agricultural sector with specific reference to gender roles.

Parties are further encouraged (para. 16) to develop national strategies, programmes and plans which focus on certain aspects of plant, animal and microbial genetic resources, notably:

- The key elements of the Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture;

- The development of inventories which consider the status of Farm Animal Genetic Resources and measures for their conservation and sustainable utilization;
- Microbial Genetic Resources (i.e. micro-organisms of interest for agriculture including mycorrhizal fungi; symbiotic soil micro-organisms i.e. nitrogen fixing).

36. Attention is also drawn to natural resources management, in paragraph 14 of Decision III/11, which recognizes the need for an integrated and multi-disciplinary approach to the planning, development and management of land resources, and to ensure a holistic systems approach, which goes beyond an agricultural focus, to address the multiple objectives related to sustainable agriculture and rural development. It is generally agreed that one cannot focus on biodiversity *per se* without addressing the wider issue of degradation of biological resources and the need for improving the management of biodiversity and other natural resources. In this context a number of resources/sub-themes are identified for attention in Annex 3 of the Decision:

    - Land resources considerations including soil erosion control, sustainable tillage, other sustainable farming or cropping; the status and pressures on agricultural land including marginal land use, pressures of urbanization; integrated land and resources management and the restoration of degraded landscapes;
    - Water Resources including precipitation and temperature variability, water quality and sustainable use through for instance irrigation management and water use;
    - Wildlife Ecology and habitats including border habitats for natural organisms beneficial to agriculture, populations such as pollinators, nematodes, soil micro-organisms, and biocontrol organisms. In line with the two initial gaps identified by the SBSTTA (recommendation II/7), Parties are encouraged to conduct case studies on pollinators and soil micro-organisms.

37. In their national strategies, programmes and plans, Parties are further encouraged to address 14 action areas which are outlined in Decision III/11, paragraph 15, and can be grouped into three categories: a) identification, monitoring and assessment actions[6]; b) actions to promote the conservation and sustainable use of agricultural biodiversity[7]; and c) actions addressing economic and legal aspects[8] (Bunning, 1997).

38. It was suggested that some guidance may be needed to assist Parties in responding to such a complex and comprehensive decision in a phased and systematic manner without duplication efforts already ongoing under the FAO system, for instance, the work of the Commission on Genetic Resources for Food and Agriculture. In this regard a number of integrated, systemic approaches based on agro-ecosystems and farming systems are available that may assist in the identification, assessing and monitoring, planning and implementation of Decision III/11.

39. Most ecosystems have been to some extent modified/cultivated by human activity for the production of food and income and for livelihood security. For example, wetlands and

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[6] *Paragraphs 15a, d, g, m and n and para. 9 and Article 14*

[7] *Paragraphs 15 a, e, f, h, i, j, and k and in line with Article 6b*

[8] *Paragraph b, c, d, l, and paras. 13 and 21*

floodplains are highly productive ecosystems which are widely used for agriculture and fisheries however they are being rapidly destroyed throughout the world by habitat destruction, siltation, salinization, pollution and urbanization. In fact, there are virtually no ecosystems in the world that are "natural" in the sense of having escaped human influence, although "protected areas" are dedicated primarily to the protection and enjoyment of natural endowment or cultural heritage, to maintenance of biodiversity and/or life-support systems/ecological processes. The impact of human activities on biodiversity may be considered at genetic, species and ecosystems levels and the ecosystem itself may be considered at different levels: the field, farm, watershed or region.

40. In analogy to ecology, agriculture can be described as a hierarchy of nested systems of increasing complexity. At the lower levels for instance, we may consider the plant (individual), the crop (population) and the field (community) and the farm level. Thus a farm is an ecosystem composed of interacting human, animal and plant populations which can be described in different ways, i.e. from biophysical and socio-economic perspectives, according to the purpose of the investigation. For instance, we may consider the livestock and cropping systems, the household or farm-livelihood system, the farm system[9] and in turn sub-regional and regional systems (Fresco, et al 1986; 1990). Such a systematic analysis can be used to understand and analyse agricultural production systems and farming systems[10].

41. Variations between farm systems at the same level may be considerable as the physical and biological environment set limits/constraints to potential production, however, they do not fix the way the farmer deals with the environment. Thus within one agro-ecological and economic environment there may be very different farm systems operating, such as hoe and ox cultivation or different crop and livestock interactions. Which farm system prevails depends on household resources, access to inputs, division of labour and cultural factors.

42. **Farming system zones** are either synonymous with agro-ecological zones (AEZ)[11] or more often than not they are sub-divisions of AEZ. Agro-ecological zoning provides a framework for FAO's integrated approach to the assessment, planning and management and monitoring of land resources. Such systems which are based on a systematic mapping and analysis of different resources features, in some cases incorporating certain socio-economic and management parameters, have been refined and used in computerized land resources appraisals and suitability analysis for certain crops and input/management levels, for example, in Bangladesh, Ethiopia and Kenya. In some cases, geographic information systems (GIS) software and databases are utilized. More recently FAO has been

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[9] *Here "farm system" refers to a specific system level in the hierarchy where a specific farm is studied as a system whereas a "Farming system" is referred for a class of similarly structured systems.*

[10] *Which are defined by the resource base, resource utilization, household and community variables and institutional factors*

[11] *An **agro-ecological zone (AEZ)** is a land resources mapping unit, defeined in terms of climate, landform and soils, and/or land cover, and having a specific range of potentials and constraints for land use (FAO, 1996). Essential variables used in defining an agro-ecological zone are climatic (growing period, temperature regime) and soil-based land qualities.*

expanding such tools into multi-purpose land resources information systems (LRIS) which are being used as an integral component of institutionalized integrated resources planning, management and conservation programmes in many countries. Some programmes combine satellite and ground-based information, i.e. the Africover programme.

43. Frameworks built on AEZ/GES and LRIS systems enable a range of considerations and the various constraints and opportunities to be addressed at the different scales and levels of analysis or intervention. For example, the agricultural calendar, watershed management, inter-household collaboration and social organization may be addressed at the local level; while extension systems and the market situation may be considered at national and provincial levels; and environmental treaties and economic agreements at international and national levels. Such frameworks combined with farming systems zoning and analysis, may provide a very useful basis on which to build for conducting a systematic analysis and assessment of the impacts of agriculture on biodiversity and, *vice versa (*Antoine and Koohafkan, 1997).

44. In recent years more participatory planning processes are being developed to enhance the involvement of all stakeholders, planners and policy makers from household and community levels to national and international in order to optimize resource allocation, identify sustainable and cost-effective land use and management options, and build a sense of ownership and responsibilization (Antoine and Koohafkan, 1997). It should be explored to what extent biodiversity issues can be systematically incorporated into such planning strategies and techniques.

45. **Farming systems analysis** (FSA) and **farming systems research** (FSR) are dynamic approaches that focus on the development of agricultural technology in order to increase long-term stability of yields and reduced risks for farmers. (Maurer and Dixon, 1997). Through understanding that farmers have multiple objectives and use their natural resources on and around the farm to satisfy many diverse needs (food, feed, fuel, fibre, pharmaceutical products, cash income, and so forth), it identifies and analyses ecological and socio-economic constraints and potentials in existing farming systems, in particular, those resulting from specific farm practices and the use of micro-variations in the environment.

46. An integrated strategy is called for to assess the impact of trends in agriculture on biodiversity and to determine strategies and mechanisms to promote the conservation and sustainable use of genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use and, thereby, to enhance the diversity, productivity and sustainability of farming systems. A greater focus should be placed on developing diverse, integrated farming systems (production systems) that enhance the conservation of biological resources as well as the land and water resources on which they rely. The approaches and mechanisms outlined above may be extremely valuable in this process.

IMPACTS OF AGRICULTURE AND INTEGRATED APPROACHES (Working Groups)

Perceptions on the impact of trends in agriculture on, and the need for integrated approaches for, the conservation and sustainable use of agricultural biodiversity

47. Participants addressed two key questions:
What need is there for an integrated approach to the conservation and sustainable use of genetic resources for food and agriculture – and what mechanisms would help?

Following this, Working Groups were asked to answer:
What are the positive and negative impacts of the trends in agriculture and the transformation of agricultural systems on all types of agricultural biodiversity?

48. While there were a broad range of views, it was generally agreed that in order to enhance the conservation and sustainable use of agricultural biodiversity, integrated approaches were considered essential, as a complement to existing sectoral approaches. It was also agreed that there was a need to develop a comprehensive understanding, and commonly understood definitions, of agricultural biodiversity and agro-ecosystems.

Summary Of Trends Influencing Agriculture

***Macro economic, policy, globalization trade, market systems*:**

49. Reference was made to trade liberalization, commercial/market forces, increasing product uniformity, privatization, the increased role of multinationals and structural adjustments of subsidies for inputs.

***Demographic, urbanization, migration*:**

50. Examples were given concerning changes in rural infrastructure, roads, access to markets, population increase, loss of traditional knowledge, increase social unrest. Population pressure promotes the need for an increased food production, but the distribution of population is also an important factor and there is significant rural out-migration, especially of young males.

***Environmental, climatic*:**

51. Mention was made of climate change, desertification, ozone depletion, and habitat degradation, changing locally-defined agro-ecosystems, as well as the effect of deforestation on agriculture and on the forest genetic resources themselves.

***Public awareness, lifestyle changes*:**

52. For example: increase in income which may lead to changes in types of food demanded (for example, higher meat consumption); organic farming, increased public awareness in the environment and the extent of human impact on this; ecotourism; polarization between agriculture and environment protection; shift in gender roles, feminization of agriculture.

***Changes in technology, farm management*:**

53. Trends included: focus on production only, developments in biotechnology, increasing modernization, organic farming, increased use of external inputs, focus on new species, farmers wanting less diversity, risk management, industrialized agriculture using

monocultures, concentration on fewer breed varieties, reduced recognition of the value of traditional practices, increased resistance to insecticides and veterinary drugs, breakdown of plant genetic resistance to disease, increase in monogastric animals, reduction in ruminants, and other impacts on grain use.

***Paradigm changes*:**

54. Substantial changes to, or the development of new, (scientific) paradigms are needed to e.g. sustainable development, and (eco)-systems management.

55. **The impact of trends in agriculture on agricultural biodiversity**

- It was noted that trends within agriculture are influenced by other trends not exclusively related to agriculture such as macro-economic forces, demographic trends as well as changes in lifestyles and public awareness. In other words, there is interdependence between factors which have an impact on agriculture and agricultural biodiversity.
- Some trends can have both positive and negative impacts on agriculture and likewise on agricultural biodiversity depending on other influencing factors or management decisions. New trends in agriculture, despite negative externalities, have positive aspects, such as increased food production.
- It was recognized as being important to develop a consumer-driven demand for agricultural biodiversity, in particular, to develop consumer awareness of intra-species diversity

56. **Benefits of integrated approaches**

- There was a general understanding about the interdependency between food production and biophysical, social, political and economic factors. The use and conservation of biological diversity is also related to these interacting factors in an increasingly complex world, among others, because of the increasing human pressure on the resource base, which is increasingly threatened due to unwise use and over-exploitation.
- The agricultural ecosystem itself as well as the existing farming systems is multi-dimensional, consisting of a hierarchy of integrated systems and sectoral components that are use or managed by humans in a variety of ways. Agriculture is an integrated activity involving the land water and climatic resources, the biological resources and their inter-relationships and the decisions and activities of farming populations.

57. **Need for integrated approaches**

- Integrated approaches are needed because long-term food security depends on the ability to conserve (*in situ*) as much agricultural biodiversity as possible. An integrated approach can improve food security, as the wide agricultural biodiversity tends to enhance sustainability, reduce risks and increase opportunities. The aim should be the sustainable production of food, rather than short-term intensive production goals. It was considered that sustainability, efficiency or effectiveness and productivity could only be realized through integrated approaches, which have the best chance of promoting the rational use and wise management and thereby promoting the sustainability of the components of biological diversity. Inter-relations between different components of agricultural biodiversity (plant, animal,

biocontrol agents, etc.) at different levels, should be considered in the context of production systems.

- Integrated approaches reduce risks, expand the resource base, and support resource conservation. They incorporate some externalities that affect biodiversity.
- An integrated approach can be valuable if it builds on and complements sectoral activities. It promotes better understanding of how the different disciplines perceive biodiversity and how they could together contribute to developing sustainable agricultural systems. Improved collaboration between various disciplines should be promoted.

58. **Mechanisms for integrated approaches**

- At the national and international level there should be agreed integrated policies on the conservation and sustainable use of agricultural biodiversity especially of assessing resources in a wider context in which *in situ* and *ex situ* conservation strategies and activities are integrated.
- At local level, farmer-to-farmer exchange and technical cooperation could prove a valuable mechanism. The Farming System Approach should be used in order to identify and understand interactions within and between sectors and at all levels.
- Better collaboration between actors should be stimulated between the different levels. The participation of all relevant actors/institutions should be guaranteed by using a participatory approach at all stages of the assessment and planning cycle. On the international level cross sectoral bodies such as the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) can facilitate the development and implementation by Member Nations of policies on agricultural biodiversity.
- Institutionally, capacity building should take place through interdisciplinary consultations and training, as necessary, and appropriate reforms in the institutional and social infrastructure should be realized. Intersectoral consultations and meetings are a useful mechanism as well as multidisciplinary information systems and extension services.
- Coordination was recognized as being a key and vital mechanism at all levels, especially of national focal points having specific thematic responsibilities. National coordinating mechanisms should involve local NGOs and farmers' and community organizations. Consultation is an important element in any development or implementation of strategies, policies, programmes, plans and activities. Information flows should be in two directions and implementation should be in the hands of decision-makers at all levels.
- Monitoring was considered an important mechanism especially when it incorporates farmer assessment. Participatory monitoring and evaluation can be used to assess policy results and effect changes in policy.
- There is a need for a bottom-up, country-driven integrated approaches. In this respect "shared responsibility" is important. There is also a need to involve all stakeholders in each sector, and between sectors.
- As an example, instead of conducting separate States of the World assessments on, for example, plant, animal and fish genetic resources a more strategic and more responsive mechanism should be developed, which might integrate these and other categories of agricultural biodiversity. It could also include the review of the entire agro-ecosystem *vis-à-vis* agricultural biodiversity conservation and sustainable use

per se. This could facilitate the identification of key constraints that need to be addressed as a priority, in different agricultural production systems (pastoral, arable, mixed, and so on) in different agro-ecosystems. Such an integrated approach could lead to the optimal use of resources and funds. Sectoral approaches may duplicate demands for resources and costs.

59. **Actions needed at a practical level to establish Integrated Approaches**

- An approach for the conservation of agricultural biodiversity within production systems should be developed. An operational strategy is needed to increase agricultural biodiversity and productivity. Medium- to long-term programmes composed of integrated, holistic, system-oriented approaches should be established. An organizational strategy should be developed to improve locally-retained profits from the use and management of a wide range of genetic resources. National and community-level action plans in line with (inter)national policies and strategies should be designed. Development projects should be cross-sectoral and use interdisciplinary teams, including local expertise. *In situ* and *ex situ* conservation should be integrated and complementary wherever possible.
- An institutional, political, and social infrastructure is required to facilitate the implementation of activities and access to needed services, including access to financial resources. Farmer support and training is essential. Facilitation of existing networks is required.
- In the short term there is a need to identify opportunities and initiate and/or strengthen work in experimental approaches, building on participatory research and learning.
- In general an approach to agriculture is needed where all initiatives are screened for their impact on the conservation and sustainable use of genetic resources of actual or potential value to food and agriculture: these could be termed **agricultural biodiversity impact assessments,** a specific development of Environmental Impact Assessments. More knowledge and understanding of environmental interactions will facilitate such assessments.
- More on a conceptual level a broadly shared understanding, and agreed definitions are needed for agro-ecosystems, sustainable agriculture and agricultural biodiversity. It is important to clarify a system and mechanisms for Access, Benefit sharing and Farmers' Rights. Indicators are required (to measure impact/follow-up). Public investment should be optimized. Optimal use of funds should be a principal goal and countries should increase support and regulations in favour of *in situ* and on-farm conservation, in view of its cost-effectiveness and the inherent continuous adaptation of genetic resources to meet changes in the physical, economic and social environment.
- Conservation should become economically attractive either through improved direct or indirect income, or other incentives, or through taxes on non-conserving farm practices, designed to internalize the external costs.

Conclusions of the Working Groups

60. From all the different aspects and views brought forward the following conclusions were drawn:

- Conservation and sustainable use of agricultural biodiversity require methodologies, strategies and activities at all levels involving all relevant organizations and institutions.
- Conservation is only possible through the sustainable use: agricultural productivity on one hand, and sustainable use of genetic resources of actual or potential value to food and agriculture, on the other hand, are essential for meeting the objectives of CBD and world food security. Food production/provision is traditionally an integrated process and efforts are required to enhance the complementarity and synergies between different biological resources and ecological processes with a vie to developing more sustainable production systems.
- Integrated agro-ecosystem approaches to planning and natural resource utilization will provide the future framework for agricultural production.
- A holistic cross sectoral approach including biological, social and economic issues is needed to assist policy makers to weigh up the different impacts of different production systems and make effective decisions. Mechanisms for implementing these cross-sectoral approaches are needed at national and international level. While sectoral constraints and opportunities exhibit more similarity than expected, differences within a sector may be more significant. There is a need, however, to build on sectoral activities, and to seek complementarities and synergies within and between sectors.
- A particular trend or development/conservation activity may affect biological diversity, and the human community in various ways. For example, the introduction of an alien (introduced) organism may provide increased economic benefits, but may in the long term endanger some local species. Strategies are required to reduce risks to the absolute minimum. A holistic cross-sectoral approach including biological, social, economic issues will be needed for policy makers to weigh up the different effects, to introduce protection and control measures and to make responsible decisions. Mechanisms for such cross-sectoral approaches and consultation between environmental and agriculture, forestry and fisheries forums are needed at national and international level.
- The importance of bearing in mind that any approach developed can only be implemented effectively if it is supported by farmers, was emphasized. As many farmers and local communities may not anticipate direct profits from implementing conservation activities, incentives may be required.

PRESENTATION OF FARMING SYSTEMS DEVELOPMENT APPROACHES (Session 3)

61. The purpose of this session was to achieve an improved understanding of the contribution of farming systems development and other integrated approaches to, and their relevance for certain aspects of the multi-year programme of activities on the conservation and sustainable use of agricultural biodiversity (COP Decision III/11). Presentations were made of the principles underlying integrated/farming systems development approaches. Also presentations of a number of case studies of current FAO programmes, highlighted participatory, technical and ecological perspectives being applied to integrated commodity approaches - viz. the FARM and FARMESA, Integrated Pest Management; Integrated Soil, Water and Plant Nutrition Management; and Aquaculture. In considering these, participants took into account sectoral approaches especially with regard to plant (food and forage crops, trees and horticultural plants) and farm animal genetic resource management and the extent to which these strengthened and complemented holistic, integrated approaches. The participants also drew on their discussions of the first day of the Technical Workshop as well as recommendations of SBSTTA-II and the decisions of COP-III and the working documents of this Workshop. These included the report of the Sweden Workshop and the paper by the Government of Brazil, which were made available to SBSTTA-II and COP-III, and the papers provided by IPGRI on farmers' contribution to maintaining the genetic diversity in crops, and its role within the total genetic resources system (see Annex 3 for a full list of these documents).

62. The potential of the Farming Systems Approach to Development (FSD) for the characterization and improvement of agricultural biodiversity, through the use of the integrated application of a set of systems and participatory methods, was demonstrated. It can be applied to different levels in the systems hierarchy where specific decisions are made, which can impact upon agricultural biodiversity, including: plot/flock/pond level, farm-household level, community level, national/sectoral policy level and global level. In particular it focuses on specific farm-household systems or on groups of similar units, (e.g. small, integrated irrigated farms, or steppe pastoralists), for the purposes of analysing constraints and opportunities and finding solutions for their sustainable improvement. The approach is well established and documented and is widely applied to agricultural development.

63. The overall objective of FSD is to improve the livelihood security of farm-households and rural communities on a sustainable basis. It has a particular advantage over more traditional single crop/species or component approaches in complex and risky farm-household systems. It complements other disciplines by adding systematic, holistic, interdisciplinary, farmer-focused elements in developing sustainable solutions. Thus, FSD is built on the development principles of improving productivity, increasing profitability, ensuring sustainability, and attaining equitability in terms of distribution of the fruits of production. It addresses the complex situations of farm-households where decisions are multivariate and gender differentiated.

64. The farm-household is the principal system and focus of FSD and consists of three basic sub-systems, which are closely interlinked through the decisions and activities of the family members. These elements are the household, the farm, and off-farm activities. The household sub-system is complex and comprises the production and consumption

activities managed by a single household, including fish, trees, annual crops, home-gardens, livestock and other household income earning opportunities. The complexity of these systems can be analyzed under 5 sets of characteristics: ecological; economic, ethical, evolutionary; and equity. They include the resource base and the patterns of utilization of these resources, the acquisition of inputs for production and consumption, and storage, processing and disposal of production and consumption. In this context, agricultural biodiversity is one set of resources that is available to farm families.

65. In order to analyse the contributions to, and the impacts of, farm-household systems to their farm-/ resource management, constraints, goals and the dynamics of development, comprehensive knowledge of the targeted farm-household systems is necessary. The methodology of FSD can provide the tools and key indicators suited to the successful implementation of a programme to achieve agricultural biodiversity conservation through sustainable use. For example, analysis of biophysical and socio-economic/cultural environment; on-farm/participatory testing, monitoring and evaluation; income, risk and impact analysis. Indicators that could be used include agro-ecological status, degree of resource access or activity restrictions; status of infrastructure; degree of resource scarcity. Examples of the application of these tools that were mentioned include the use of FSD in stable and biodiverse urban farm-household systems and, in contrast, in the analysis of certain agro-forestry systems, which can no longer compete with crop-based agricultural systems that may be more risky but are more profitable in the short term.

66. The inter-relationships that need to be considered when analyzing the impacts of agricultural production systems on agricultural biodiversity are complex. For example, economic analyses, which exclude the value of productivity changes of natural resources, can over-estimate the value of resource-degrading farming practices. If the sustainability of the ecological processes underlying economic activity is recognized to have value, then sustainability must be explicitly included as one of the objectives to be pursued by economic policy makers and planners.

67. FSD provides tools to analyse the value, productivity and sustainability of agricultural biodiversity resources, as well as the other inter-relationships exhibited in the complex of farm-household systems decision making and resource management. It is thus a potentially powerful tool for providing better information and analysis on the management of agricultural biodiversity, of use for decision making and planning at many different levels from the farm-household to policy making.

68. It was pointed out that when carrying out analysis of farm-households as production systems, and as units of consumption, this must include consideration of intra-household dynamics and an analysis of gender roles and relations. This should also include analysis disaggregated by gender, age and ethnic groups, etc. of: access to and control of resources; decision-making patterns (power relations); as well as identification of the ‘ownership’ or ‘custodians’ of agricultural biodiversity knowledge at the household and community level.

69. There was also concern that assumptions about knowledge values are gender and power-based and it is more effective to first establish the knowledge base and information requirements of the farmers/resource users who are the object of interventions. This might also help to underscore the diversity of these producers such as: large scale/small scale;

food/cash crop production; men/women; full/part time; more diverse/mono-cropping system; single-family/community-level system, and so on.

70. Therefore when thinking of how to support farm-household level systems it is important to recognize these diverse characteristics of 'farmers', who will interpret and implement actions related to agricultural biodiversity conservation and use in very different ways. The use of participative, interactive approaches allow more effective understanding and analysis of differences and their implication. They would also be more effective in helping understanding of how farm level incentive systems, that would encourage farmers to adopt agricultural biodiversity conservation practices, particularly practices that are sustainable and profitable, could be introduced, and how consumers could be encouraged to demand intra-species food diversity.

71. Finally, participants recognized that in holistic, integrated farming systems approaches, production and productivity are different, but are both intrinsically important to food security. Using such approaches for the better the management of agricultural biodiversity requires a balance between different sectors and how these are linked across sectors. Sectoral approaches are not mono-disciplinary and therefore are not alternatives to system approaches: they are multi-disciplinary designed to respond to specific issues and concerns which have also to be addressed through systematic approaches. These need to consider the interactions and linkages between the sectoral components at all levels (i.e. agro-silvo-pastoral and agro-forestry approaches address some of these relationships). Participants also noted that farming system approaches are also applicable to large-scale farming systems and industrial agriculture and are also relevant to the implementation of sustainable agricultural systems used in developed countries.

CASE STUDIES

FARM and FARMESA

72. The FARM programme of eight Asian countries targets the resource degradation-poverty complex, which is prevalent in the rainfed areas of Asia. The beneficiaries are the farming communities in the uplands and rainfed lowlands of Asia. In line with population growth and economic development, the pressure on agricultural resources of land, water, pastures, forests and biodiversity continues to increase. Farm households manage these resources. As a consequence the resulting farm-household systems - crop, livestock and tree practices, off-farm employment, and consumption patterns determine ultimately the status of farm and their communal resources. FARM commenced operations in August 1994, as a composite programme of seven sub-programmes covering key components related to sustainable agricultural resource management: people's participation, farming systems, watershed management, agro-forestry, integrated pest management, biotechnology and biodiversity and pesticide information. These incorporate several key features of farming systems development approaches, including participation, gender-sensitivity and organizational partnerships.

73. The FARMESA programme has only recently commenced. It is an integrated farming systems development programme, which covers three countries in southern and eastern Africa. It has intermediate objectives concerned with the development of field methodologies for the identification, prioritization and adoption of appropriate

smallholder technologies, documentation, training, and collaboration with a range of institutions. It has activities on research, the development of decision-support systems and the use of video in appropriate communications. It has links with ALCOM a multi-country aquaculture development programme in SADC countries and other relevant regional programmes.

Integrated Soil, Water and Plant Nutrient Management

74. The case study on the conservation of agricultural biodiversity through integrated soil, water and plant nutrient management in Central America, highlighted the alarming land degradation through soil and water erosion, and the resulting loss of soil fertility, increased water pollution and siltation in the valley bottoms. This results directly in loss of agricultural biodiversity, productivity, and food security. High agricultural biodiversity through providing a good vegetative cover, rooting system, and contributing to the organic matter of the soil assists in the restoration of degraded soils as well as its intrinsic conservation. To achieve this requires holistic approaches to land management and participative appraisal, planning, technology selection and implementation at farm, community and micro-catchment levels. It involves, *inter alia*, increasing soil cover including the use of green manures and mulches as well as organic manures from the use of mixed crop-livestock systems, improving water infiltration and controlling run-off, and reducing tillage. Its effective development requires the involvement of multi-disciplinary teams, inter-institutional agreements and integrated programmes, to improve research, extension, education and infrastructure. Above all, it requires support to informed decision making by farmer and community level organizations.

Integrated Pest Management

75. Plant Protection has a number of direct links with biodiversity and AGPP's programmes. While Article 8 of the Convention on Biodiversity states "Prevent the introduction of control or eradicate those alien species which threaten ecosystems, habitats and species", the International Plant Protection Convention with its Secretariat in AGPP seeks to limit the spread and introduction of pests by setting standards for international phytosanitary measures as called for in the Agreement on Sanitary and Phytosanitary Measures concluded in the Uruguay Round of Trade Negotiations. Phytosanitary measures should have an economic justification; environmental considerations like protection of natural fauna and flora are considered to be included in such justifications. The Code of Conduct on the Import and Release of Exotic Biological Control Agents developed by AGPP promotes the safe use of biological control species against introduced pests.

76. As clearly recognized in Decision III/11 of the CBD, pesticide has a direct effect on biodiversity. Through the propagation of appropriate pesticide management and Integrated Pest Management (IPM) the negative impact of pesticides on biodiversity is reduced as much as possible. The promotion of the implementation of the International Code of Conduct on the Distribution and Use of Pesticides is the corner stone for appropriate pest management. IPM is the careful integration of a number of available pest control techniques that discourage the development of pest populations and keep pesticide use and other interventions to levels that are economically justified and safe for human health and the environment. IPM, however, addresses more than pest management; it also offers an entry point to improve the farming system as a whole.

Successful implementation has three components: applicable research results, a policy change away from pesticide subsidies, and a farmer participatory training programme, especially through Farmer's Field Schools. IPM is a very participatory system: to succeed IPM has to be a farmer-driven process.

77. IPM has very broad implications for crop genetic resilience because it makes farmers the direct managers of their agro-ecosystem. It is an example of an agricultural application of conservation and use of biological diversity. It focuses on the importance of natural enemies in keeping pest populations under control. It also helps to maintain pest-resistance bred into plants, enabling farmers to continue to grow a wide range of varieties. IPM can also help farmers select for allelopathy of some crop varieties to control unwanted weed species. Substantial global IPM implementation programmes are conducted by FAO in particular in South East Asia and Africa. Additionally, FAO is the host organization in collaboration with World Bank, UNDP, and UNEP of the Global IPM Facility which works with local, national and international expertise, knowledge and resources to facilitate the processes of IPM project identification, design and implementation.

Aquaculture

78. Aquatic genetic resources are the basis of fisheries, aquaculture and the health of the aquatic environments and they contribute to the food security and livelihood of millions. There is a diversity of aquaculture systems ranging from highly industrialized high input systems to very low input systems that resemble natural water bodies which produce aquatic organisms for direct harvesting or for the restocking of 'wild' populations. The systems are dependent on water quality and the health and composition of their surrounding biodiversity, and *vice versa*. Work on aquaculture and fisheries contributes to, and is influenced by, various COP decisions including the Jakarta Mandate (COP Decision II/10 and its Annexes), as well as Decision III/11 and, among others, Articles 7, 8(h), and so on, are directly relevant. The outcomes of the expert consultation meeting in early 1997 in Jakarta, arising as a result of Decision II/10, is also of relevance. Discussions by SBSTTA-III and the COP-IV on Inland Waters ecosystems will be especially relevant, as well.

79. A relevant case study of the use of aquaculture in integrated production systems is a programme on the integrated snail management in rice in Viet Nam, to control an introduced aquatic snail pest. This involves the collection of data, the incorporation specific training modules in IPM Farmer Field Schools and the promotion of the use of carps for the biological control of snail pest. In addition, other organisms such as ducks are part of the integrated system to control the pest. Several other examples were provided, such as polyculture of Chinese carps and rice cum fish culture in Indonesia using tilapia.

80. The implementation of the FAO Code of Conduct for Responsible Fisheries will address the importance of genetic diversity in aquaculture and will require the development of guidelines for the responsible movement of exotic species and genetically modified organisms, of relevance to Article 8(h) of the CBD. Also required is the documentation of the diversity of aquaculture species and the collection of information of the kind and amount of aquatic species harvested or produced, an activity fundamental to the

implementation of Article 7 of the CBD. This information may also serve as an indicator of threat to genetic diversity, as required by Decision III/11. In aquaculture the number of species under culture is currently increasing, but the sector is still challenged, however, to continue to diversify in order to meet market demands and increase food security and at the same time protect natural aquatic biodiversity.

PRIORITIES FOR PROMOTING FARMING SYSTEMS/AGRO-ECOSYSTEMS APPROACHES (Working Groups)

81. The purpose of the working group discussions in this session was to identify the main issues and to move towards agreement on the priority areas of focus and the linkages and mechanisms needed, at all levels, in order to promote the conservation and sustainable use of agricultural biodiversity. The subsequent plenary discussion further developed the understanding of the rationale, scope and mechanisms for developing holistic, farming systems and/or ecosystems approaches to promote the sustainable use of agricultural biodiversity by rural communities and smallholder farmers, was developed.

82. In particular, the participants considered how, through integrated ecosystems/farming systems approaches, and within the scope of the Decision III/11 and all three objectives of the Convention, it would be possible to strengthen farmers' capacities and improve necessary support systems to farmers and farmers' associations. Also, the ways of achieving improved instruments at National and Regional/International levels, were considered. Participants were asked to prioritize issues and components, identifying mechanisms to be addressed as part of an integrated programme to promote a farming systems/agro-ecosystems approach in response to the COP-III Decision on agricultural biodiversity.

83. Taking into account ongoing work, participants were asked to identify issues (strengths, weaknesses, opportunities and threats) for the conservation and sustainable utilization of agricultural biodiversity, keeping sight of: i) ecological, ii) human and iii) economic dimensions and the linkages between these and between all levels, from the farm-household to international and *vice versa.* On the basis of this assessment, participants then prioritized issues, activities and processes, and identified linkages and mechanisms needed at all levels (farm-household to international), to promote a farming systems/agro-ecosystems approaches, in particular in response to the agricultural biodiversity Decision COP III/11 (as well as other decisions of the COP), and with reference to all three objectives of the Convention.

84. Two of the Working Groups focused on the mechanisms, processes and techniques needed to strengthen farmers' capacities and provide support to farmers and farmers associations, in order to improve conservation and sustainable use of agricultural biodiversity. They discussed the actors that needed to be involved in this process and how to build on farmers' views, knowledge and decision making, whilst respecting Farmers Rights; how to develop networks and partnerships; and the types of cooperation required e.g. government-community; farmer-researcher, etc. The other two Working Groups considered how to address policy issues more effectively and build better interfaces between institutional and policy mechanisms at national, regional and inter-governmental levels to promote farming systems/agro-ecosystems approaches, and improved linkages

between environmental and agricultural institutions and other partners, in order to improve conservation and sustainable use of agricultural biodiversity.

85. A number of key issues were identified and two key areas were highlighted that require further work:

i) identification of the relationship between agricultural biodiversity, yield and quality of produce, and food security; in different production systems;
ii) investigation of the sustainability of different types of production systems in the context of the multiple requirements of local communities.

In this context a number of issues were identified that need addressing. There is a need for:

Economic issues

- The internalization of the external costs of agriculture;
- The use of incentives to encourage farmers to adopt conservation-friendly management practices;
- Increased choice and diversification in production, processing and consumption, building on local knowledge, including a greater focus on minor species, maintaining species and intra-species diversity, and how farmers can benefit from the changes in technology;
- Building on sectoral approaches; ensuring adequate incentives, including profits for farmers;
- Influencing and assessing the impact of markets and assessment of the need for incentive policies that value agricultural biodiversity and its components;
- Comparing monetary benefits and costs of agricultural biodiversity conservation;
- Additional funding for the development and implementation of the work programme on agricultural biodiversity, especially in the initial stages.

Support

- Provision of effective support systems for agricultural biodiversity conservation and infrastructure development;
- Developing the role of governments and the role of national focal points and their coordination mechanisms;
- Appropriate institutional arrangements at all levels in order to improve farmers' active involvement in decision making and planning and their political strength;
- Effective linkages at all levels;
- Training, and mechanisms, for understanding and renewing knowledge systems.

Assessment

- Assessing loss of traditional cultivars and the limitations and strengths of *in situ* conservation and *ex situ* gene banks and their complementarities;
- Common indicators and agreed definitions of, and terminologies about, agro-ecosystems, agricultural biodiversity, and so on.

Approaches

- Identifying entry points and good examples of existing work and 'product champions';
- Participatory approaches in programme development and implementation and full participation in policy formulation;
- Research into how to change paradigms, in order to enable local-level sustainable production to compete with the dominant market-driven paradigm.

86. This last issue regarding changing the paradigm was considered a main goal of new work, not to change within the existing paradigm but to change the paradigm itself, making it robust enough to withstand market pressures. Questions were raised about the key sector that could act as a trigger for the paradigm change, the external factors that should be taken into account and the time horizon over which the changes could be introduced. A possible starting point could be through participatory land-use planning at national and local levels and the development of integrated strategies for agricultural biodiversity conservation and the planning of biodiversity conservation as a whole.

87. It was recognized that there are considerable dynamic developments already occurring, for example, mechanisms developed by the CBD and FAO and numerous programmes of relevance and interest in different sectors. A challenge is how to build on these and introduce and/or strengthen cross-sectoral approaches, including the integration of crop and livestock systems. Position papers reflecting all policies affecting agricultural biodiversity, identifying required linkages and identifying how to coordinate and increase the value and use of ongoing assessments, could be a useful tool. The CBD and FAO could advise, through frameworks, guidelines and workshops, on the strategy for the development of such tools.

88. Change has to take place at a local level: farmers' and consumer organizations need to be convinced of the need and opportunity for change. Change cannot be directed from above, but an adequate policy framework reflecting society's goals, is needed, to be implemented by farming communities, properly supported by appropriately trained civil servants, scientists and other actors. National strategies should reflect national interests.

89. There is a need for coordination mechanisms at national levels, for instance between policy makers in decision-making positions, who attend the COP and CGRFA, respectively, and between technical officials from:

- Ministries of agriculture, environment, tourism, foreign affairs, trade, planning; universities and research institutes. This should reduce report duplication of efforts and enhance coordination and effectiveness in assessment and reporting;

- NGOs and the private sector; as well as
- Strengthened representation by farmers from all sectors of production.

90. In the different international governing bodies and the relevant financial mechanisms (WTO, World Bank, IMF, CBD/COP, FAO) different ministries at national level are usually involved. The liaison between national focal points should be strengthened and the flow of information should be broadened.

91. The information required includes the need for adequate feedback/communication to stakeholders nationally, including the public and NGOs, about international discussions and agreements, in order to increase awareness and support. There are identifiable gaps in the mechanism between the national governmental level, on the one hand, and farmers' organizations, consumers, NGOs, press and media, on the other.

92. It is important that agricultural biodiversity rises up the political agenda. To assist with this, there is a need for national Public Relations campaigns: the lack of political commitment prevents the right policies from being developed and resources mobilized. One such political hurdle is negotiating the revised International Undertaking, in harmony with the CBD, which includes articles on scope, access and Farmers' Rights.

93. There is also a need for international cooperation between relevant bodies to improve information sharing and understanding, and effectiveness and efficiency. Effective cooperation between WTO, CBD and FAO and GEF should be intensified strongly, both at the institutional level and through thematic cooperation. This should be strengthened through a country driven process to improve international cooperation.

Working Groups Feedback

94. The outcome of the Working Group discussions and the plenary feedback indicated the priority that needs to be given to long-term sustainable agriculture development, in order to achieve improved agricultural biodiversity conservation. It was recognized that there is a paradigm shift occurring, which is leading to the need to identify and support different, sustainable methods of production. This will require changes in policy, new farmer-led research, the development of viable alternative production technologies, as well as improved understanding at all levels, better information and greater awareness of the need to conserve agricultural biodiversity through sustainable utilization.

95. These changes will need to build on existing sectoral approaches as well as develop cross-sectoral, integrated and holistic approaches, building on farmer's' priorities, within agreed national policies and strategies. In order to achieve the necessary changes in policy and to implement required activities, there will be a need for improved coordination among national focal points and good linkages and coordination with all relevant actors.

96. There is an identified need to define the primary production systems and agro-ecosystems nationally, and to assess, plan and report not only the agricultural biodiversity contained in these but also on the potential for sustainable utilization in each area, emphasising the

advantages of using a wider range of agricultural biodiversity. There needs to be improved understanding of, and collection of relevant data to identify, the cost of loss, and the value, of agricultural biodiversity at farm and other levels. It was felt that there needs to be a coincidence of economic and ecological priorities, which may require the development of appropriate incentives, in order for there to be a shift towards enhanced conservation.

97. A renewal of knowledge systems is required, to the extent possible building on the existing and differentiated local knowledge of men and women farmers who may be dependent on, *inter alia*, agricultural crops, forest resources, livestock, as well as herders, and fishers. To achieve these changes will require the provision of appropriate research, especially on *in situ* conservation approaches, case studies highlighting sectoral and cross-sectoral experiences and lessons and the development of policy position papers. It will also need 'champions' who can make the most of new opportunities for work in this area, finding appropriate 'entry points' for this, within an agreed framework.

98. Such transformation, as well as the need to review existing programmes, projects and activities of relevant agencies, including the FAO, with a view to modifying those that are contributing to genetic erosion, was stressed.

99. Lastly, the identification of appropriate and complementary roles for FAO, CBD and other organizations was emphasised.

ACTIONS NEEDED TO PROMOTE AND ACHIEVE INTEGRATED WORK ON AGRICULTURAL BIODIVERSITY (Working Groups)

100. The final session was modified to accommodate developments in the Workshop and the views of participants. It was decided that the final session should focus on actions and activities required for assessment as well as economic and legal aspects of the conservation and sustainable use of agricultural biodiversity. The proposals were grouped under the headings of information and awareness raising; support to Governments; and international level coordination.

101. Participants commented that it was important to identify examples, case studies, position papers, policies, etc., which need to be prepared, as well as the mechanisms needed to identify examples of win-win situations (biodiversity conservation with sustainable profit for farmers), which can be developed further and which may attract GEF and other appropriate funding. The need to provide incentives for the diffusion of sustainable agriculture practices may also need to be considered.

102. Mechanisms need to be identified for improving public awareness and educational systems, as well as research and development in sustainable agriculture and agricultural biodiversity conservation, possibly involving the private sector. There is also a need to find ways of identifying product champions (countries, institutions and individuals) that can promote the sustainable agriculture and agricultural biodiversity conservation worldwide.

103. Support for the development of national plans, programmes and strategies (relevant coordination mechanisms) at all levels is required, through FAO, CBD and others. This also requires better reporting, assessments and coordination and the development of appropriate indicators. These national programmes and strategies on agricultural biodiversity need to be coordinated and incorporated into National Biodiversity Strategies and, equally important, these biodiversity strategies need to be incorporated into agricultural strategies and plans and National Forest Action Programmes.

104. There is a need to look at concrete and operational programmes and project activities in the context of CBD-FAO cooperation. A major requirement is to define tasks, priorities of FAO (and CBD), with targets and deadlines, defining responsibilities, leading to the formulation of decisions. The key actions required for the short and the longer term need to be identified as well as identifying how these relate to cross-sectoral and existing sectoral activities and programmes, in operational terms. There is a need for coordination mechanisms between FAO and CBD, especially *vis-à-vis* reporting and assessment on different components of agricultural biodiversity. The meeting of the liaison forest biological diversity provides an example of collaborative work between the CBD and FAO. The approach being proposed by DIVERSITAS, which involves actors from many sectors, was cited as a valuable example of collaboration. Existing agreements, such as between FAO and IPGRI on a wide range of work on genetic resources, and FAO and IAEA on the development of new cultivars through mutation breeding, are other examples of inter-institutional collaboration.

105. In the light of these comments, participants were asked to identify appropriate actions in each of the areas to be considered. These actions could include the identification of mechanisms for: developing appropriate partnerships; consultations through meetings workshops, e-mail conferences, and so on; the use of working groups or expert groups; the development of papers reports and case studies; determining coordinated funding strategies; and developing required legal aspects of the conservation and sustainable use of agricultural biodiversity. These were discussed in the time available and a series of conclusions were arrived at, focusing on increasing information and awareness, support to governments and international coordination.

(***NB The conclusions of the Workshop and summary Tables are presented at the start of this document (page v and following) and are not repeated here***)

SUMMING-UP

106. The Workshop participants agreed that humankind is going to have to utilize sustainably every type of agricultural biodiversity at all levels, genetic, species and agro-ecosystem, if, as is required for universal food security, sustainable food production is to be achieved across the whole range of production environments.

107. To achieve this will require the implementation of existing and new intergovernmental processes in order to stimulate national level activities for enhancing the conservation of agricultural biodiversity through its sustainable use within agro-ecosystems as well as at species and genetic levels.

108. All relevant organizations, institutions and individuals, from policy makers to producers, will need to be actively involved, through the provision of knowledge, expertise and resources. This should ensure implementation of activities under Decision III/11 (and other relevant decisions of the COP) as well as other relevant mechanisms such as the World Food Summit Plan of Action, the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture and other sectoral strategies, plans, programmes, codes of conduct and so on, covering farm animals, forestry, fisheries, and so on.

109. The development of the joint FAO-CBD programme of work is an important and positive development and should give a powerful signal to the international community and to national level institutions. This programme of work will need to build on and complement established sectoral activities, promoting a better understanding of how different disciplines can work together.

110. Through the agreed activities of this joint programme, participants at the Workshop agreed that significant progress will be made in the development of mechanisms and processes to operationalize the multi-year programme of activities on the conservation and sustainable use of agricultural biological diversity, at local, national and international levels.

ANNEXES

ANNEX 1

AIDE MEMOIRE

Towards a framework for integrated action on agro-biodiversity

Recalling the decision of the Third Conference of the Parties to the Convention on Biological Diversity (CBD) on agricultural biological diversity, the decisions of FAO Governing Bodies with respect to the implementation of the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture and the progress achieved to date in the revision of the International Undertaking on Plant Genetic Resources;

Recognizing the important progress made at the Technical Workshop on Agro-biodiversity organized jointly by FAO and the CBD Secretariat, with support of the Government of the Netherlands, in the Queen Juliana Room, at the FAO Headquarters, Rome, 19-20 June 1997;

Considering that the conservation and sustainable use of agricultural biological diversity is a key issue for sustainable agriculture;

Noting the call of the FAO Council and of the Conference of the Parties to the Convention on Biological Diversity for the timely conclusion of the negotiations on the revision of the International Undertaking on Plant Genetic Resources;

The undersigned

Are committed to ensuring that agro-biodiversity constitutes an integral part of their respective policies, plans and programmes in the field of agriculture and natural resources;

Agree that one of their main priorities will be the development and implementation of an integrated Work Programme on Agro-biodiversity, plans for the development of which will be made available for information during the FAO Conference in 1997 and during the Fourth Conference of the Parties to the Convention on Biological Diversity in 1998 (COP-IV);

Underline the importance for FAO and the CBD-Secretariat to initiate the development of the appropriate institutional mechanism for implementation of this work programme, taking into account existing systems and networks;

Will promote active participation in the implementation of the Work Programme on Agro-biodiversity of Governments, intergovernmental institutions, non-governmental organizations and the private sector;

Intend to organize a parallel informal workshop at COP-IV on the Work Programme, with the financial support of the Government of the Netherlands;

Note the offer of the Government of the Netherlands to provide support to FAO's initiative to organize regional workshops in order to promote the implementation of the Global Plan of Action;

Recognize the importance of making operational the Global Plan of Action at the regional and sub-regional levels and the need to make available appropriate means for that purpose as well as the implementation of Decision III/11 of the Third Conference of the Parties to the Convention on Biological Diversity;

Decide to organize a Second "Queen Juliana Room Technical Workshop" on agricultural biological diversity in the second half of 1998 at FAO Headquarters.

Signed in threefold, Rome, 20 June 1997

The Assistant Director-General Sustainable Development Department of the Food and Agricultural Organization

Henri Carsalade

The Executive Secretary of the Convention on Biological Diversity

Calestous Juma

The Director-General for Agriculture, Nature Management and Fisheries, The Netherlands

Johan F. de Leeuw

ANNEX 2

FARMING SYSTEMS APPROACHES FOR THE SUSTAINABLE USE AND CONSERVATION OF AGRICULTURAL BIODIVERSITY AND AGRO-ECOSYSTEMS
A technical workshop organized jointly by FAO and the CBD Secretariat, with the support of the Government of the Netherlands
19-20 June 1997, Queen Juliana Room, FAO - Rome
WORKSHOP TIMETABLE

Session	**Activity**	**Expected Output**
Thursday, 19 June 14:00-15:30 Session 1a: Information Sharing **Chair:** J.B.Pieters Permanent Representative of the Kingdom of the Netherlands to FAO	• Opening of the Workshop: The context, the aims of the Technical Workshop and practical information. (J.B. Pieters, Permanent Representative of the Netherlands to FAO) **PRESENTATIONS:** • The position and interest of the Government of the Netherlands with regard to agricultural biodiversity. (P.A. Vermeij, Ministry of Agriculture, Nature Management and Fisheries) • The evolution of the CBD and its implications for agricultural biodiversity. (Calestous Juma, Executive Secretary CBD) • The understanding and focus in FAO of agricultural biodiversity. (Henri Carsalade, Assistant Director-General, Sustainable Development Department, FAO) • The mandate of the Commission on Genetic Resources for Food and Agriculture (CGRFA) and mechanisms in place . (José Esquinas, Secretary CGRFA) • The work of the CGIAR, with reference to agricultural biodiversity, and in particular the work of IPGRI and the System-wide Genetic Resources Programme (SGRP). (Dr Geoff Hawtin, Director IPGRI)	(a) Clarification of areas of common concern of the programmes and priorities of FAO and the CBD Secretariat, and (b) Identification linkages between programmes in FAO (the Organization and its Member Nations), CBD and other development partners.
15:30-15:45	***Coffee/tea***	

Session	Activity	Expected Output
Thursday, 19 June 15:45-17:30 Session 2: Existing work, opportunities and threats **Chair:** C. Juma Executive Secretary, Convention on Biological Diversity	• Exercise - Need for Integrated Approaches • Presentation of a Framework illustrating key areas of FAO's ongoing programme on agricultural biological diversity with reference to relevant COP-III decisions. (Sally Bunning, supported by brief interventions from Technical Divisions) • Plenary discussion, with reference to certain trends in the agricultural and environmental sectors that need to be addressed. (Facilitator) • Group Discussions (4 groups) to discuss the positive and negative impacts of trends in agriculture and transformations of agricultural production systems on agricultural biodiversity 30 mins *(I-India Room; II-Philippines Room; III-Ethiopia Room; IV- Queen Juliana Room)* • Plenary Feedback and close of session	Participants obtain an overview of : i) ongoing work at ecosystem, variety/breed and gene levels, ii) existing linkages and mechanisms at different levels, and, iii) potential areas of focus/linkages. To begin to identify weaknesses. To identify potential areas of focus with regard to the degree of impact of different production systems and recent trends in agriculture on agricultural biological diversity. To summarize geographic, genetic and socio-economic factors
Friday, 20 June 08:45-10:30 Session 2: Case studies and identification of mechanisms, resources and processes **Chair:** T. Aldington, Senior Technical Adviser, Agriculture Dept., and Sec. to the Committee on Agriculture, FAO	• Link to previous afternoon's session • Presentation of farming systems development approaches (J. Dixon) and examples of other integrated approaches being used in FAO programmes (IPM, Soils, Aquaculture) • Plenary discussion to increase understanding of the rationale, scope and mechanisms for developing holistic, farming systems and/or ecosystems approaches to promote the sustainable use of agricultural biodiversity by rural communities and smallholder farmers • Summarize Plenary - assign Working Group tasks	Improved understanding of the contribution of farming systems development and other integrated approaches to the conservation and sustainable utilization of agricultural biodiversity
10:30-10:45	***Coffee/tea***	

Session	Activity	Expected Output
Session 2: (Continued) 10:45-12:45	Group discussions (4 groups) (A) Taking into account ongoing work, identify issues (strengths, weaknesses, opportunities and threats) for the conservation and sustainable utilization of agricultural biodiversity, keeping sight of : i) ecological, ii) human and iii) economic dimensions and the linkages between these - and between all levels (farm <---> international) (B) Prioritize issues, activities and processes, and identify linkages and mechanisms needed at all levels (household to international), to promote a farming systems/agro-ecosystems approach in response to the agricultural biodiversity decision, with reference to all three objectives of the Convention. **<u>(Groups I / II) Farmer/Producer-centred</u>** *(I - India Room; II - Philippines Room)* How to strengthen farmers' capacities and provide support to farmers and farmers associations, in order to improve conservation and sustainable use of agricultural biodiversity. **<u>(Groups III / IV) Policy/Institutional Mechanisms</u>** *(III - Ethiopia Room; IV - Queen Juliana Room)* How to address policy issues more effectively and build better interfaces between institutional and policy mechanisms at national, regional and inter-governmental levels to promote farming systems/agro-ecosystems approaches, in order to improve conservation and sustainable use of agricultural biodiversity.	Better understanding of what considerations need to be taken into account, the priority areas of focus and what linkages and mechanisms are needed, at all levels, to promote the conservation and sustainable use of agricultural biodiversity, in particular through integrated ecosystems/farming systems approaches, in order to: • strengthen farmers' capacities • improve necessary support systems to farmers and farmers' associations? • achieve improved instruments at National and Regional/International levels for the conservation and sustainable use of agricultural biodiversity
12:00	• Plenary feedback from groups (Queen Juliana Room)	Agreement on key components, priorities, linkages and mechanisms needed at different levels, taking into account cross-sectoral issues.
12:45-14:00	***Lunch***	

Session	Activity	Expected Output
Friday, 20 June 14:00-15:45 Session 3a: Identification of priority components of, and processes, mechanisms and resources for achieving, an integrated programme, and follow up. **Chair:** H. Carsalade, Assistant Director-General, Sustainable Development Dept., FAO	• Sum up of consensus achieved, decisions to be made, and suggesting a proposed working process for the final discussions, to identify key activities needed to support rural communities and smallholder farmers, in the context of the 3 objectives of the CBD. • Group Discussions (4 Groups) on activities which could enhance the conservation and sustainable use of agricultural biodiversity, in particular through using integrated / agro-ecosystems approaches, and identifying priorities for: 1. Assessment and monitoring 2. Conservation and Sustainable Use 3. Economic and Legal aspects *(W - India Room; X - Philippines Room; Y - Ethiopia Room; Z - Queen Juliana Room)* • Feedback from Working Groups	On the basis of priority requirements for enhancing the conservation and sustainable use of agricultural biodiversity through using integrated, holistic approaches: • **Propose processes for developing** appropriate mechanisms, instruments, activities, partnerships, linkages (including resources) • **Identify gaps** and proposals of how to develop other processes to fill these.
15:30-16:20	***Coffee/tea***	
16:20-17:00 Session 3b: Presentations of conclusions and decisions on follow-up **Chair:** Johan de Leeuw, Director-General, Ministry of Agriculture, Nature Management and Fisheries, The Netherlands	• Presentation of conclusions and decisions for follow-up • Closing of the Workshop (H. Carsalade, ADG/Sustainable Development Department, FAO; Calestous Juma, Executive Secretary, CBD Secretariat; and Johan de Leeuw, Director-General, Ministry of Agriculture, Nature Management and Fisheries, Netherlands)	A summary of the outcome of the different sessions of the workshop and Resume of a **programme development process -** strategy; objectives/activities; mechanisms and instruments; partners; resources required etc.

ANNEX 3

Working Documents, Papers and Presentations

I. Convention on Biological Diversity

II. COP-III papers on agricultural biological diversity:

A. UNEP/CBD/COP/3/14: Consideration of agricultural biological diversity under the Convention on Biological Diversity (Note by Executive Secretary)

B. UNEP/CBD/COP/3/38 Annex 2: Decisions adopted at the third Conference of the Parties (COP-III) to the Convention on Biological Diversity, 4-15 November 1996, Buenos Aires

C. Extract UNEP/CBD/COP/3/38: Decision III/11 Conservation and Sustainable Use of Agricultural Biological Diversity

D. UNEP/CBD/COP/3/15: Progress under the FAO Global System for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (report by FAO)

E. UNEP/CBD/COP/3/Inf.7: Integrating Biological Diversity into Agricultural Development (Note by the Executive Secretary)

F. UNEP/CBD/COP/3/Inf.16: The Global Strategy for the Management of Farm Animal Genetic Resources: Links to the Convention on Biological Diversity (report by FAO, 1996)

G. UNEP/CBD/COP/3/Inf. 17: Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (adopted at FAO International Technical Conference on Plant Genetic Resources, Leipzig, 23 June 1996)

H. UNEP/CBD/COP/3/Inf.18: Report on the State of the World's Plant Genetic Resources for Food and Agriculture (First Report, FAO, 1996)

I. UNEP/CBD/SBSTTA/Inf.18: Agricultural Biological Diversity: A proposal of the Brazilian Government to SBSTTA-II

III. CGRFA papers

A. CGRFA/7/97/3 Progress report on the FAO Global System for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture

B. CGRFA/7/97/8.1 Report of the FAO on its policies, programmes and activities on agricultural biological diversity: (1) Plant Genetic Resources

C. CGRFA/7/97/8.2 Report of the FAO on its policies, programmes and activities on agricultural biological diversity: (1) Other sectors of agricultural biological diversity

D. CGRFA/7/97/REP Report of the 7th Session of the CGRFA

IV. Other papers circulated or otherwise made available to participants

A. Biodiversity and Sustainable Agriculture: report of a workshop organized by the Swedish Scientific Council on Biological Diversity, 14-17 August 1996, Ekenas, Sweden

B. Mainstreaming Biological Diversity in Agricultural development: Towards Good Practice, World Bank Environmentally Sustainable Development paper (August 1996)

C. World Food Summit: Rome Declaration on World Food Security and World Food Summit Plan of Action (1996)

D. A Farming Systems Approach to Development and Appropriate Technology Generation, FAO Farm Systems Management Series, Bulletin No. 10. (1995)

F. Coche and Pedini (1997) Establishment of the Aquatic Farming Systems Information Network for Africa, and Expert Consultation on Small-scale Rural Aquaculturre, FAO Aquaculture Newsletter April 1997 No. 15

V. Papers presented or circulated during the workshop

A. Maurer, M. and J. Dixon (1997) Conservation and sustainable use of agro-biodiversity through a holistic farming systems approach: relevance of the farming systems approach to an agro-biodiversity programme. FAO, Rome

B. Bartley, D.M. (1997) Agricultural biological diversity in aquaculture, FAO, Rome

C. Antoine, J. and A.P. Koohafkan (1997) Application of agro-ecological zoning and GIS tools for the assessment, valuation and conservation of biological diversity, FAO, Rome

D. Benites J.R. (1997) Agricultural biodiversity conservation and sustainable utilization through integrated soil, water and plant nutrient management, FAO, Rome

E. FAO (1997) Plant protection and biodiversity, FAO, Rome

F. Cooper, H.D., C. Spillane, I. Kermali, N.M. Anishetty (1996) Harnessing Plant Genetic Resources for Sustainable Agriculture, ICPPGR, FAO, Rome

G. IPGRI (1997) CGIAR System-wide and Ecoregional Programmes relevant to genetic resources, and, Genetic resources activities of the international agricultural research centres of the Consultative Group on International Agricultural Research (CGIAR)

H. Eyzaguirre, P. and M. Iwanaga (1996) Farmers' contribution to maintaining the genetic diversity in crops, and its role within the total genetic resources system, IPGRI, Rome

VI. Presentations by the Government of the Netherlands

A. Vermeij, P.A., Ministry of Agriculture, Nature Management and Fisheries, The Netherlands

B. De Leeuw, J.F., Director-General, Ministry of Agriculture, Nature Management and Fisheries, The Netherlands

Presentations by the Government of the Netherlands

Opening Speech by P.J. Vermeij of the Ministry of Agriculture, Nature Management and Fisheries of the Netherlands

"The position and interest of the Government of the Netherlands with regard to agricultural biodiversity"

I would like to present you the points of interest and concern from the Netherlands Government with regard to biodiversity and in particular agro-biodiversity.

The Netherlands Government signed the Convention on Biological Diversity during the UN Conference on Environment and Development (Rio de Janeiro, 1992) in order to reinforce international and national efforts for the conservation and sustainable use of biodiversity, taking into account the principles of complementarity and synergy.

We try to find ways to effectively link the goals, activities and players involved in national and international policy; because this is crucial for implementing the Convention. Therefore this meeting is very important to us.

Our aim is to continue an active contribution to relevant conventions and international fora (including the European Union, the Council of Europe, and the United Nations) concerned with nature conservation, specific ecosystems, biological and genetic resources, the environment, agriculture, etc.

The two elements I would like to mention today are:

- our concerns about agro-biodiversity
- and our international approach

The importance of agro-biodiversity

The Netherlands Government considers the conservation and sustainable use of agro-biodiversity to be an integral part of the policy for sustainable agriculture and rural development. It also contributes to integrated land-use planning as mentioned in UNCED – Agenda 21. In relation to the genetic resources within the agro-industrial system itself, we are aiming for the *in situ* and *ex situ* conservation and sustainable use of varieties of plants, animals and micro-organisms with an actual or potential value for agriculture.

So, for national and international policy-makers following two issues are crucial in coming decades:

- the food security issue: how to secure enough food for the growing world population? But also
- the sustainability issue: how to develop a sustainable agriculture for the long term ?

Agricultural biodiversity (= agro-biodiversity) might be the answer, only if we can solve the technical, juridical, economical, political aspects of this complex challenge.

Let me concentrate on the substance.

Let me recall only a few elements showing the importance of agro-biodiversity. Agro-biodiversity is the total of plant genetic resources of crops and related wild species that are of actual or potential value for food and agriculture. It represents the basic raw material for the improvement of crops now and in the future. In the past thirty years concern has been increasing over the loss of biodiversity in general and plant genetic resources in particular. Plant genetic resources are being lost in an alarming rate, due to habitat destruction and land degradation, over-exploitation of water resources, modern agricultural practices, urban expansion and because of a rapidly increasing world population.

Traditional agriculture is a main provider of genetic diversity of crops. Traditional farming systems are a direct extension of natural ecosystems. Natural ecosystems achieve sustainability primarily through balances based on genetic diversity between and within species, allowing continued adaptation to changing environments. The same strategy of adaptation to environments is employed in traditional farming systems. The main objective is not maximizing yields but rather to insure yield security. Hence traditional farming systems still harbour important genetic diversity of crops in the form of landraces of great importance to the institutional system of genebanks.

Modern agriculture based on high inputs applies a fundamentally different strategy. Instead of adaptation to the environment, the environment is adapted to the requirements of the crops by controlling soil fertility with fertilizers, water availability where needed by irrigation, removing competition by other organisms for the crops by chemical control, and so on.

The need to increase food production for a growing world population is evident. Traditional cropping systems are often less productive in purely quantitative terms and are breaking down because of a multitude of external socio-economic influences. At the same time it is clear that modern agriculture does not hold all the answers. In variable environments the economic risk of employing costly external inputs such as fertilizer may be too high. In addition, modern plant breeding is limited in its ability to address the enormous diversity of crops and environments because of institutional, technical, economic and conceptual constraints. The obvious conclusion is that while traditional farming systems, specifically in centres of diversity of crops, are a major source of genetic diversity for modern agricultural systems, they have so far received little attention and benefits in return. This unbalance is forcefully illustrated by the fact that while ownership of the products of institutional plant breeding - modern varieties - are in many countries protected by *sui generis* legal systems and in the case of biotechnology even by industrial patents, landraces produced by generations of farmers are conveniently considered a free resource.

Looking from another angle - not from the agricultural production side, but from a more holistic approach - agro-biodiversity could be considered in the spirit of the CBD as an ecosystem used for agriculture and food production. As such, the theme of agro-biodiversity is similar to the ecosystem themes marine/coastal biodiversity or forests.

This way of considering agro-biodiversity implies that for agro-biodiversity three levels could be distinguished: these are:

1. the level of ecosystems (the interaction of ecosystems between ecosystems);
2. the level of species (species between species);
3. and genetic variety within species.

It is my opinion that there should be no restriction within or between these three levels mentioned, so we should strive for the development of a common policy-theme bridging all these components.

Only in this way a viable sustainable agriculture with agro-biodiversity as backbone could be developed.

Why do we care ?

Because ensuring sustainable agriculture and growth will enhance:

1. the urgently needed balance between economy and ecology;
2. the viability of small farmers. And small farmers are still the dominant pattern of production in the main part of our world.

As this topic is in the process of development nationally and internationally, I touch upon my second point:

What is the policy of the Netherlands internationally ?

After a thorough evaluation of our foreign policy in which the multilateral element is important, we reshaped our Foreign Affairs policy including Development Cooperation. In policy development, we are focusing among others nowadays on following main points:

- strengthening our role in multilateral organizations through investment in bilateral relations;
- combining regional activities through a more thematic input;
- policy development through an integrated approach;
- by a mentality of pro-active and future-oriented thinking;
- through a flexible input of our professionals.

To be more exact on our theme of today, I give you in brief our political highlights.

Development cooperation policy integrates biodiversity, agro-biodiversity and sustainable nature management objectives in an effort to achieve sustainable development. Negative impacts on nature and the environment in developing countries have to be avoided.

Where possible biodiversity, agro-biodiversity and sustainable nature management objectives will be incorporated in programmes and projects designed to alleviate poverty.

Special attention is paid to the protection of natural ecosystems, forests, species habitats and traditional agricultural breeds and cultivars. So a great value is attached to areas of origin of agricultural crop varieties. Sectoral Policy papers on biodiversity, agro-biodiversity, tropical rain forests, wetlands, marine ecosystems and coastal zones, savannahs, steppes and mountain ecosystems have been drawn up by the Directorate-General of Development Cooperation.

This means we are and will be active on:

a) the multilateral (EU - and UN -) scene:

In making the UN-system more effective and efficient, we try to have a coordinated, integrated policy in the *gremia* of CSD, FAO, UNEP, CBD and other organizations relevant for sustainable development, relevant for agro-biodiversity,

In preparing the necessary policy in the EU - Council of Ministers in Brussels as well as on working group level.

b) the bilateral scene:

The Netherlands Government has decided to intensify its bilateral cooperation with a number of countries in the field of biodiversity.

We signed a cooperation agreement for sustainable development with the so-called B.B.C.-countries, Buthan, Benin and Costa Rica. The three countries and the Netherlands have identified the conservation and sustainable use of biodiversity, including the access to genetic resources and biosafety to be a main policy priority.

Focusing on the FAO/CBD cooperation:

We are enthusiastic about the recently started cooperation between FAO and CBD. However, we do believe as a necessary follow-up, all relevant agencies should be involved in the process of policy development and implementation as well. This means besides CBD, FAO, IPGRI and World Bank, also GEF, IUCN, UNEP, regional institutions and national responsible organizations should be involved in the process of policy development as well.

So there is a system working on several levels. Let us use this system in an effective and efficient way.

COP-III established a clear mandate for the CBD-secretariat to start gaining knowledge and information on this theme and to propose actions in order to fill possible policy-gaps.

Conclusion

The position, interest and commitment of the Netherlands on the theme agro-biodiversity is substantial.

We want to put pressure on the process and get high-level political involvement in this major economic, political and social issue.

Nationally we passed the preparation stage with formulating our Strategic Action Plan. Now we reach the phase of formulating a coordinated policy on this theme.

Internationally, we are in favour of a bilateral and multilateral (EU - and UN -) approach. This is manifested, among other ways, in the search for closer and more effective cooperation between government, private organizations and the business and research communities, both nationally and internationally. The Netherlands Government places great emphasis on the search for the efficient and selective harmonization of efforts within existing frameworks.

I wish you a fruitful brainstorming session .

Closing Speech by the Director-General of the Ministry of Agriculture, Nature Management and Fisheries of the Netherlands, Mr. J.F. de Leeuw

The objectives of this joint CBD Secretariat and FAO Workshop were to explore the development of an integrated, holistic farming systems approach for promoting the conservation and sustainable use of agricultural biological diversity, with particular attention to rural communities and the smallholder

farming sector, and the development of a joint agro-biodiversity working programme to strengthen policy and technical support to Member Nations. These objectives are not only challenging, they can be considered as a unique. Hardly ever in history have those concerned with the conservation of nature and others dealing with development goals such as food production and food security, come together with the aim of formulating common goals. I remember the FAO Conference in den Bosch in 1992 focusing on agriculture and environment as a major breakthrough in the formulation of policies on sustainable agriculture. However, it gave little attention to the aspect of agro-biodiversity. It was only during recent years in the process for developing the Technical Conference on Plant Genetic Resources in Leipzig that the extreme importance of the conservation and sustainable use of plant genetic resources found worldwide recognition. It was also during this same Conference that people became aware of the need to formulate policies in this field that integrate conservation and development goals. This Technical Workshop should be considered as the first concrete result of this awareness.

Over the past decades the plant genetic resources (PGR) community has built up a basic international framework for cooperation in the conservation of genetic diversity. At the policy level we have the FAO Commission on Genetic Resources for Food and Agriculture and an International Undertaking stressing plant genetic resources as a "heritage of mankind", recognizing Farmers' Rights and national sovereignty as a principle but emphasizing international responsibility for conservation and promotion of its use. The principle of free exchange between gene banks is a cornerstone of this system.

However the PGR community is not isolated. It is now bound by the Convention on Biological Diversity, superseding the FAO Undertaking. The Convention is overall a very positive development, as it provides a multilateral commitment to conserve the world’s biodiversity. There are however a number of outstanding issues that still need to be resolved around plant genetic resources that are of direct interest and concern if a cooperative structure is to be maintained. These are the interpretation of national sovereignty as it affects plant genetic resources, related to this the status of *ex situ* collections gathered before the Convention, and thirdly issues related to benefit sharing in general and Farmers' Rights in particular.

In the present economic and political climate it will not be easy to come up with solutions to these issues in line with overall objectives of world food security and biodiversity conservation. In the whole process of formulation and negotiations that resulted in the Biodiversity Convention, the primary focus was on the conservation of natural biodiversity. However in Agenda 21, a blueprint for environmental action including biodiversity, the special situation of plant genetic resources was recognized. FAO has taken the lead by organizing a Technical Conference in Leipzig, last year. The Conference adopted a global plan of action as part of the global system. The implementation of this global plan should take place as an integral part of the global system and in harmony with the Convention on Biological Diversity.

Decision III/11, "Conservation and sustainable use of agricultural biological diversity", taken by the Third Meeting of the Conference of Parties of the Biodiversity Convention, recognizes the importance of the outcomes of the Leipzig Conference and offers all the ingredients for an excellent cooperation between FAO and the CBD. It notes that FAO and CBD should develop a programme in order to promote the positive effects and mitigate the negative impacts of agricultural practices on biological diversity in agro-ecosystems and their interface with other ecosystems; promote the conservation and sustainable use of genetic resources of actual or potential value for food and agriculture; and promote the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The Technical Workshop of the last two days should be considered as an

important step towards the formulation of such a joint working programme of the most important key players in this field.

ANNEX 4

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ANNEX 5

ACRONYMS

AEZ	Agro-ecological zones
ALCOM	Aquaculture for Local Community Development Programme
CBD	Convention on Biological Diversity
CGRFA	Commission on Genetic Resources for Food and Agriculture
CHD	Crop Husbandry Database
CHM	Clearing-house Mechanism
COP	Conference of the Parties
CTE	Committee on Trade and Environment (WTO)
DAD-IS	Domestic Animal Diversity Information System
ECOCROP	Crop Environmental Requirements Database
EU	European Union
FARM	Farmer-centred Agricultural Resource Management Programme
FARMESA	Farm-level Applied Research Methods in East and Southern Africa
FAO	Food and Agriculture Organization of the United Nations
FAOSTAT	FAO Statistical Database
FSA	Farming Systems Analysis
FSD	Farming Systems Approach to Development
FSR	Farming Systems Research
GBF	Global Biodiversity Forum
GEF	Global Environment Facility
GIS	Geographic Information Systems
GOs	Governmental Organizations
GPA	Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture
IAEA	International Atomic Energy Agency
ICLARM	International Centre for Living Aquatic Resources Management
IMF	International Monetary Fund
IPGRI	International Plant Genetic Resources Institute
IPM	Integrated Pest Management
ITC	Intermediate Technology Consultants
ITDG	Intermediate Technology Development Group
IUCN	The World Conservation Union
LRIS	Land Resources Information Systems
MoU	Memorandum of Understanding
NARS	National Agricultural Research Systems
NEAPs	National Environmental Action Plans
NGOs	Non-governmental Organizations
PGR	Plant Genetic Resources
PoA	Programme of Action
SADC	South African Development Community
SBSTTA	Subsidiary Body for Scientific, Technical and Technological Advice
SIS	Seed Information System
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WB	World Bank
WFS	World Food Summit
WIEWS	World Information and Early Warning System
WCMC	World Conservation Monitoring Centre
WTO	World Trade Organization