

## **Consultative Group on International Agricultural Research**

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From: The Secretariat

April 19, 1993  
MT/93/18

### **Mid-Term Meeting, May 23-29, 1993** **San Juan, Puerto Rico**

#### **Agenda Item 13 - Progress Report on Possible Follow-Up** **Action on UNCED Agenda 21**

#### **Report by the** **Working Group on Possible Follow-Up Action** **for the CGIAR on UNCED Agenda 21**

Attached is a paper prepared by Stein W. Bie and Cassandra E. Bergstrom in response to the CGIAR's request to have Mr. Bie develop further proposals on a CGIAR response to Agenda 21.

At the Mid-Term Meeting, Mr. Bie will summarize his interactions with individuals within and outside the CGIAR community and outline a proposal for three global programs, which is described in the paper.

The Group will be given the opportunity to raise issues of concern and to decide whether to endorse the Working Group's proposal.

#### **Distribution**

CGIAR Members

Center Board Chairmen

Center Directors

TAC Chairman, Members, Secretariat

# NORAGRIC

NORWEGIAN CENTRE FOR INTERNATIONAL AGRICULTURAL DEVELOPMENT  
AGRICULTURAL UNIVERSITY OF NORWAY

Dr. Alexander von der Osten  
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Washington, D.C. USA

Your ref.:

Our ref.:

Date: 15 April 1993

Dear Alexander,

At ICW92 you requested me to develop further proposals on a CG response to Agenda 21 and to report at MTM93.

Please find enclosed a report prepared by Cassandra Bergstrøm and myself, with the financial support of the Norwegian Ministry of Foreign Affairs. We have consulted widely with centre directors and staff, with NARS and with the donor community to arrive at the proposal for three global programmes.

If MTM93 is in favor of one or more of the proposed programmes, we believe you should consider elaborating the proposals into fully-fledged programme proposals suitable for submission to donors. TAC may wish to comment on these when available. We believe such proposals may be attractive to donors to seek budget allocations not normally committed to international agricultural research. In particular, we believe that a responsible reaction by the CGIAR to the calls for support given through A21 could enable donors to look at the CG system as a competent and useful organization for achieving A21 aims.

Sincerely yours,

  
Stein W. Bie

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**CGIAR RESPONSE  
TO UNCED's AGENDA 21**

Prepared for the CGIAR Mid-term Meeting, San Juan, Puerto Rico,  
May 1993

by

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and  
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## EXECUTIVE SUMMARY

The objective of this paper is to suggest how the CGIAR can specifically respond to A21 in a transparent and focused mode by launching **3 global programmes** in addition to reviewing its on-going activities through the process of medium term plans. The 3 global programmes represent focused activities building on the knowledge present in many IARCs. In time the impetus of the 3 global programs may influence the future direction of CGIAR's work.

This paper suggests:

- that the CGIAR should respond forcefully to A21 calls for more environmental concern in research, by launching a **Global Soils and Water Programme**;
- furthermore that the CGIAR should respond to A21 calls for further research in biodiversity, by extending its traditional role in *ex situ* conservation of mandate crops to stronger *in situ* conservation and development of complete production systems, and extend its interests into the genetic resources of livestock and fish that form part of these production systems, through a **Global Genetic Resources Programme**;
- and finally that the CGIAR should meet the A21 challenge on human and institutional capacity building by utilizing and extending its traditional roles in support of capacity building in developing countries by a **Global Human Resources Capacity Building Programme**.

This paper is intended as basis for discussions between the administrators and the donors of the CGIAR system. In a possible follow-up to this paper, CGIAR's Technical Advisory Committee (TAC) and the IARCs will be required to aid the development of specific activities within the 3 global programmes.

## INTRODUCTION

When world leaders agreed on Agenda 21 (A21) at the UNCED meeting in Rio de Janeiro in June 1992, they also requested the international research community to consider specific contributions that it could make towards implementing A21. CGIAR is one of the world's largest international research systems. Governments of both rich and poor countries therefore expect the CGIAR to respond specifically to A21, in addition to maintaining and developing its normal agricultural research agenda. Although many, if not most, of the activities currently undertaken by the individual agricultural research centres (IARCs) relate closely to the wide-ranging list of initiatives requested by A21, the CGIAR would be ill-advised to respond simply by saying that since the CGIAR is doing A21-activities already, it is "business as usual".

## BACKGROUND

The A21 initiative comes at a time when the CGIAR is already under severe economic strain, as IARCs strive to fulfill the agreed research programmes, and to develop new four-year medium term plans (MTPs) in 1992/93. Resources required to implement significant specific responses to A21 are simply not available within the CGIAR at the present time. The limited funds available from donor countries for agricultural research cannot be diverted into A21 activities. On the other hand, there are specific challenges in A21 for which the CGIAR is uniquely placed to respond, provided CGIAR can gain donor confidence as a credible executing mechanism for A21 activities.

The development of this report, which has been done by independent consultants, has been based on close consultations with a wide selection of centre directors and senior IARC staff, with members of national research systems in developing countries, and with donor community representatives. Guidance has also been sought from the CGIAR Chairman and Secretariat on specific issues. The starting points for this report have been a series of CGIAR studies and deliberations on sustainability issues, on ecoregional mechanisms and an initial paper on A21 follow-up, as well as a review of the proceedings during recent International Centers Weeks and Mid-Term Meetings (ICWs and MTMs) of the CGIAR. A further starting point is the basic premise that CGIAR is first and foremost a research system supporting sustainable practices within the primary industries on which the poor communities of the developing countries rely. CGIAR is not A21's research system. However, A21 activities are very relevant to CGIAR's own research agenda. CGIAR will therefore benefit from selected A21-designated activities conducted by IARCs.

Given current funding, the CGIAR does not have the possibility to launch 3 major global programmes. A prerequisite for the 3 global programmes is therefore that donors both to international agricultural research and to the

implementation of A21 become convinced of the value of asking the CGIAR to undertake activities within the three proposed fields in support of A21.

## **CGIAR STRENGTHS IN RELATION TO AGENDA 21**

CGIAR acts as a coordinating body for 18 individually governed research centres all dedicated to the mission statement of the CGIAR:

**"Through international research and related activities, and in partnership with national research systems, to contribute to sustainable improvements in the productivity of agriculture, forestry and fisheries in developing countries in ways that enhance nutrition and well-being, especially among low-income people."**

This document relates to system-wide issues in the CGIAR. Whilst CGIAR has a duty to develop an overall strategy for its involvement in A21, individual IARCs may and should develop their own additional strategies.

As a system the CGIAR has a number of logistic advantages:

1. Existing institutions
2. Well documented
3. Reviewed
4. Apolitical
5. Global/international
6. Address development, sustainable resource management and poverty eradication simultaneously
7. Compliments, rather than competes with national agricultural research systems ... "tries to identify themes and opportunities where national programmes have little incentive to become involved, either because of economies of scale or because spillover effects are so large they cannot be captured by them".
8. Rate of return of agricultural research 25 - 100%/yr. in perpetuity

## **A21 has 3 most relevant items to the CGIAR:**

1. Poverty alleviation
2. Increased agricultural production
3. Environmental protection

## **Relevant concepts from A21**

A21 is a comprehensive analysis of many development issues. The following are a selection of points particularly relevant to a possible CGIAR involvement in the implementation of A21:

35.7 b "Identify research needs and priorities in the context of international efforts."

14.29 "International institutions, such as FAO and IFAD, international agricultural research centres, such as CGIAR, and regional centres should diagnose the world's major agro-ecosystems, their extension, ecological and socio-economic characteristics, their susceptibility to deterioration and their production potential. This could form the basis for technology development and exchange for regional research collaboration."

35 Programme Areas

A. "Strengthening the scientific basis for sustainable management."

B. "Environment and development policy formulation, building upon the best scientific knowledge and assessments, and taking into account the need to enhance international cooperation and the relative uncertainties of the various processes and options involved."

35.22 "Develop, strengthen and forge new partnerships among national, regional and global capacities to promote the full and open exchange of scientific and technological data and information and to facilitate technical assistance related to environmentally sound and sustainable development. This should be done through the development of mechanisms for the sharing of basic research, data and information, and the improvement and development of international networks and centres, including regional linking with national scientific databases, for research, training and monitoring..."

14.41 a "Develop databases and geographical information systems to store and display physical, social and economic information pertaining to agriculture, and the definition of ecological zones and development areas;

14.39 b "Develop internationally accepted methodologies for the establishment of databases, description of land uses and multiple goal optimization."

## General activities of the CGIAR with relevance to A21

In addition to its mission statement the CGIAR may be expected to have a competitive advantage in:

1. Measurement of rates of resource degradation
2. Support for capacity building
3. Contribution for methodology for characterizing, analyzing and evaluating interventions in major ecological zones
4. Strengthening of national systems so they can more effectively serve farmers
5. Collection, evaluation and dissemination of available information from the global research community that is relevant to national policy choices

A21 spans a wide field of development issues. CGIAR is an agricultural research entity and cannot be expected to tackle all global challenges. Similarly, the CGIAR should not lose its identity by attempting to cover a wide range of A21 issues. It would seem more efficient if the CGIAR, as its contribution towards the

implementation of A21, concentrates on a limited number of fields of activity. By doing so the CGIAR could present its initiatives in the form of **Global Programmes**. These **Global Programmes** should not be new agricultural research themes; they are themes of environmental significance where the experience from successful agricultural research is utilized for wider environmental issues. The primary industries are major users of land, water, and genetic material and simultaneously their custodians. Wiser use of resources not only requires research but also capacity-building in the developing countries themselves.

At International Centers Week 1992 (ICW92) a CGIAR Secretariat Paper (" A CGIAR Response to UNCED Agenda 21 Recommendations") identified 10 areas to which the CGIAR could contribute to A21:

- (i) increase productivity of good agricultural land to relieve the pressure on marginal ecosystems;
- (ii) conservation of germplasm;
- (iii) genetic improvement of crop, livestock, forest and fishery resources;
- (iv) integrated pest management to reduce the dependence on chemical pesticides;
- (v) nitrogen-fixation in crops and trees;
- (vi) crop mulches to reduce erosion;
- (vii) more sustainable use of water resources;
- (viii) integrated agriculture/aquaculture systems for small farms;
- (ix) agroforestry;
- (x) socioeconomic policy research.

The present analysis of A21 suggests that these 10 items could suitably be packaged into 3 fields in which the CGIAR could make significant contributions:

1. Soils and water issues
2. Genetic resources
3. Human resources capacity building.

We believe the donors can more easily relate to 3 rather than 10 themes. The suggestion is therefore that in relation to A21 the CGIAR should profile itself as a responsible entity contributing towards fulfilling many of the ambitions of A21 within these 3 fields, and offer to undertake **3 Global Programmes**.



## SOILS AND WATER

Soil and water are two essential elements in sustainable agricultural production and in sustainable management of natural resources. Recent changes in emphasis in a number of IARCs suggest that soil and water issues are becoming more central in the research portfolios in the work of many IARCs. CGIAR's response to A21 should be to focus further on these issues. The following challenges exist:

### 1. Exploit underutilized tropical "problem" soils

#### Introduction

As pressure on land increases it becomes essential to utilize optimally those soil resources whose productive potentials are currently underutilized. Better utilization of these more productive soils may also lower the pressure on the more marginal soils. Three broad types of soil conditions deserve strong CGIAR attention:

- vertisols
- acid soils
- dry land soils

Priority interventions for each of these soil conditions require different interventions. These are suggested for main targets for CGIAR efforts.

#### Vertisols

- i. tillage
- ii. drainage

#### Acid soils

- i. liming
- ii. fertilizers, including rock phosphate
- iii. selection of suitable plant material

#### Dry land soils

- i. water harvesting techniques
- ii. fertility management
- iii. selection of suitable plant material
- iv. mixed crop livestock systems
- v. anti-erosion measures
- vi. irrigation issues
- vii. policy

The rationale for these intervention may be illustrated by some examples from A21:

14.46 d "Develop and implement programmes for the progressive use of non-cultivated land with agricultural potential in a sustainable way"

10.7 f "Compile detailed land capability inventories to guide sustainable land resources allocation, management and use at the national and local levels."

12.18 a "Implement urgent direct preventive measures in drylands that are vulnerable but not yet affected, or only slightly desertified drylands, by introducing (i)/improved land-use policies and practices for more sustainable land productivity; (ii)/appropriate, environmentally sound and economically feasible agricultural and pastoral technologies; and (iii)/ improved management of soil and pastoral technologies; and (iii) improved management of soil and water resources;"

12.27 b "To improve production systems in order to achieve greater productivity within approved programmes for conservation of national resources and in the framework of an integrated approach to rural development;"

12.42 a ""Develop and introduce appropriate improved sustainable agricultural and pastoral technologies that are socially and environmentally acceptable and economically feasible;"

16.3 d "To evaluate the agricultural potential of marginal lands in comparison with other potential uses and to develop, where appropriate, systems allowing for sustainable productivity increases."

## 2. Improve soil fertility

### Introduction

Soil fertility is frequently the first limiting factor for agricultural production under smallholder conditions. Smallholders have frequently limited access to commercial fertilizers, and may have to rely on other ways of replenishing soil nutrients. With increasing urbanization there will be a net transfer of soil nutrients from the countryside to the cities, breaking traditional nutrient recycling practices among smallholders in many parts of the world. Maintaining and increasing the productivity of good soils may also reduce the need to cultivate or rely on commercial forestry from marginal lands

- A. Study the long-run effects (nutrient economy) of:
  - increased cropping intensity (incl. trees) on different soil types (tropical soils);
  - crop rotation systems
- B. Carry out research on the efficient use of inputs
  - purchased
  - manure
  - green manure

- C. Further research agroforestry
  - nitrogen-fixing trees
  - managed fallow
  - crop/livestock productivity
  - fuel production
  
- D. Further develop urban/peri-urban horticulture , including bio-energy production
  - utilization of municipal wastes, giving attention to the accumulation of heavy metals
  - nutrient recycling
  - hydroponics
  - policy

#### Relevant examples from A21

14.86 b "Integrate organic and inorganic sources of plant nutrients in a system to sustain soil fertility and determine mineral fertilizer needs."

14.87 b "Review technical and economic potentials of plant nutrient sources, including national deposits, improved organic supplies, recycling, wastes, topsoil produced from discarded organic matter and biological nitrogen fixation."

14.86 "Formulate and apply strategies that will enhance soil fertility maintenance to meet sustainable agricultural production and adjust the relevant agricultural policy instruments accordingly"

16.25 i "Promote the appropriate use of bio-fertilizers within national fertilizer programmes."

16.3 f "To increase the efficiency of nitrogen fixation and mineral absorption by the symbiosis of higher plants with micro-organisms."

### **3. Improve soil conservation**

#### Introduction

Soil loss, whether associated with physical erosion or excessive leaching of nutrients or excessive accumulation of salts, constitutes potential reduction in crop productivity, as well as the biodiversity associated with farming systems. It is important to identify and implement practices that can prevent soil loss.

- A. Develop appropriate tillage methods for soil and water conservation.
  
- B. Identify a broad range of technical options for sustaining soils, appropriate to the economic and social characteristics of the farming populations of the agro-ecosystem and of forestry. This should include inventories of natural resources.
  
- C. Develop methods to reduce agriculturally derived toxic elements
  
- D. Policy

### Relevant examples from A21

40.8 c "Countries and, upon request, international organizations should carry out inventories of environmental, resource and developmental data, based on national/global priorities for the management of sustainable development. They should determine the gaps and organize activities to fill those gaps within the organs and organizations of the United Nations systems and relevant international organizations, data collection activities, including those of earthwatch and world weather watch, need to be strengthened, especially in the areas of urban air, freshwater, land resources (including forests and rangelands), desertification, other habitats, soil degradation, biodiversity, the high seas and upper atmosphere. Countries and international organizations should make use of new techniques of data collection, including satellite-based remote sensing. In addition to the strengthening of existing development-related data collection, special attention needs to be paid to such demographic factors as... special groups ... women ... children ..."

12.18 a) "Improved land-use policies and practices for more sustainable land productivity"

b) "Appropriate, environmentally sound and economically feasible agricultural and pastoral technologies"

c) "Improved management of soil and water resources"

14.91 b "Train farmers and women's groups in plant nutrition management, with special emphasis on topsoil conservation and production"

35.11 "Carry out research programmes in order better to understand the carrying capacity of the earth as conditioned by its natural systems, such as the biogeochemical cycles, the atmosphere/hydrosphere/litho-sphere/cryosphere, the biosphere and biodiversity, the agro-ecosystem and other terrestrial and aquatic ecosystems"

14.41 c "Encourage integrated planning at the watershed and landscape level to reduce soil loss and protect surface and ground water resources from chemical pollution."

10.9 "Governments at the appropriate level, in collaboration with national institutions and interest groups and with the support of regional and international organizations, should launch awareness raising campaigns to alert and educate people on the importance of integrated land and land resources management and the role that individuals and social groups can play in it. This should be accompanied by provision of the means to adopt improved practices for land use and sustainable management."

12.19 a "Develop land-use models based on local practices for the improvement of such practices, with a focus on preventing land degradation. The models should give a better understanding of the variety of natural and human-induced factors that may contribute to desertification. Models should incorporate the interaction of both new and traditional practices to prevent land degradation and reflect the resilience of the whole ecological and social system;"

## **4. Develop methods for the rehabilitation of degraded lands (saline/acid/toxic/severely eroded)**

### Introduction

Whilst the emphasis in CGIAR soils work should be on prevention, it remains a fact that poor people often have to farm soils that have been severely degraded. Amelioration is therefore required to ensure that the fertility of these soils is enhanced, and that appropriate management methods are developed that can improve productivity on affected land. Rehabilitation may help alleviate further encroachment on marginal lands. This will require an integration of policy

management with technical and human issues for sustainable resource management.

- A. Assess the extent and the underlying causes of on-going environmental degradation processes and implications to policy options
- B. Further develop afforestation techniques/options
- C. Further develop drainage techniques
- D. Develop stress tolerance in plants (See genetic resources)

#### Relevant examples from A21

14.45 b "To prepare and implement comprehensive policies and programmes leading to the reclamation of degraded lands and the conservation of areas at risk, as well as improve the general planning, management and utilization of land resources and preserve soil fertility for sustainable agricultural development."

14.46 "Develop and implement programmes for the rehabilitation of land degraded by water-logging and salinity"

14.52 "Develop and strengthen institutional capacity to identify and implement effective conservation and rehabilitation practices that are appropriate to the existing socio-economic physical conditions of the land users;

12.17 b "To rehabilitate moderately to severely desertified drylands for productive utilization and sustain their productivity for agropastoral/agroforestry development through, inter alia, soil and water conservation;"

12.18 d "Promote improved land/water/crop - management systems, making it possible to combat salinization in existing irrigated croplands; and to stabilize rainfed croplands and introduce improved soil/crop -management systems into land-use practice;

12.4 b "Combating land degradation through, inter alia, intensified soil conservation, afforestation, and reforestation activities;"

12.6 c "To establish a permanent system at both national and international levels for monitoring desertification and land degradation with the aim of improving living conditions in the affected areas."

12.8 a "Review and study the means for measuring the ecological, economic and social consequences of desertification and land degradation and introduce the results of these studies internationally into desertification and land degradation assignment practices;

12.10 c "Determine benchmarks and define indicators of progress that facilitate the work of local and regional organizations in tracking progress in the fight for anti-desertification. Particular attention should be paid to indicators of local participation.

16.25 g "Develop applications (of biotechnology) to increase the availability of stress-tolerant planting material for land rehabilitation and soil conservation;"

## 5. Assess the possible effects climate change may have on soil

### Introduction

There is much concern about possible effects of more permanent changes in global climates, e.g. resulting from increased level of greenhouse gases and reduced levels of ozone. Through global protocols and conventions, such as the most recent Convention on Climate Change, world governments have attempted to reduce the emissions of gases and compounds thought to influence global climates. The outcome of these efforts is still uncertain, both in the short and long term, and the potential effects changes may have on agriculture remain uncertain. The agricultural research community should evaluate both the negative and positive effects of possible climate change.

- A. Availability of new lands
  - management practices
  - fertility
- B. Land lost
  - desiccation
  - inundation
  - salt water intrusion
- C. Soil micro-organisms
  - effects of ultra-violet radiation
- D. Agricultural contributions to possible climate change
  - increased carbon dioxide uptake
  - methane production e.g. from paddy rice and ruminants
  - changes in albedo due to changes in farming systems.

### Relevant examples from A21

9.21 c "Consider promoting the development and use of terrestrial and marine resources and land-use practices that will be more resilient to atmospheric changes and fluctuations;"

## 6. Development of principles and methods for sustainable management of fresh water resources (including drainage)

- water quality, quantity and health
- improve the efficiency of use of limited water resources, including policy options concerning of access to groundwater
- toxicity
- freshwater fish production requirements
- management of international rivers

### Relevant examples from A21

12.9 c "Strengthen national and regional meteorological and hydrological networks and monitoring systems to ensure adequate collection of basic information and communication among national, regional and international centers."

12.23 b "Promote integrated research programmes on the protection, restoration and conservation of water and land resources and land-use management based on traditional approaches, where feasible."

### Chapt. 18, Point F, "Water for sustainable food production and rural development"

18.65 "Sustainability of food production increasingly depends on sound and efficient water use and conservation practices consisting primarily of irrigation development and management, including water management with respect to rain-fed areas, livestock water-supply, inland fisheries and agro-forestry. Achieving food security is a high priority in many countries, and agriculture must not only provide food for rising populations, but also save water for other uses. The challenge is to develop and apply water-saving technology and management methods and, through capacity-building, enable communities to introduce institutions and incentives for the rural population to adopt new approaches, for both rain-fed and irrigated agriculture. The rural population must also have better access to a potable water-supply and to sanitation services. It is an immense task but not an impossible one, provided appropriate policies and programmes are adopted at all levels -local, national and international. While significant expansion of the area under rain-fed agriculture has been achieved during the past decade, the productivity response and sustainability of irrigation systems have been constrained by problems of waterlogging and salinization. Financial and market constraints are also a common problem. Soil erosion, mismanagement and overexploitation of natural resources and acute competition for water have all influenced the extent of poverty, hunger and famine in the developing countries. Soil erosion caused by overgrazing of livestock is also often responsible for the siltation of lakes. Most often, the development of irrigation schemes is supported neither by environmental impact assessments identifying hydrologic consequences within watersheds of interbasin transfers, nor by the assessment of social impacts on peoples in river valleys.

## 7. Develop methods for improved soil and water management

### Introduction

- Further develop aquaculture/agriculture systems such as rice/fish fields
- Assess the effects of deforestation on water supply
- Develop afforestation techniques to alleviate soil erosion into major water sources
- Develop remedial policy options for improved soil and water management in both irrigated and rainfed systems

### Relevant examples from Agenda 21

See point 6.

## GENETIC RESOURCES

The Convention on Biological Diversity presented in June, 1992, clearly underlines the importance of both conservation and sustainable utilization of genetic resources. Genetic resources have always been central to CGIAR activities, particularly for crops, to a lesser extent also for livestock. Indeed, many major IARC successes can be traced to creative use of plant genetic resources. The CGIAR plays a leading role in the *ex situ* conservation of plant genetic resources, and exercises a global responsibility for long-term conservation for its mandate crops. IARCs have a clear competitive advantage in *ex situ* plant genetic conservation, and have also significant *in situ* conservation capabilities. Enhancement and utilization of these resources is also central to many of the centres. Several IARCs have recently also embarked on ambitious modern biotechnology programmes.

### 1. Conserve the genetic resource base

#### Introduction

As a major user of genetic material the CGIAR has absolute responsibility for mandate crops in international agricultural research:

- maintain diversity;
- utilize;
- ensure future food needs.

It is becoming increasingly obvious that the maintenance of wild relatives of the important food crops deserves increased attention.

#### A. Gene bank conservation

Gene banks have the double objectives of conserving and facilitating the use of genetic resources. The CGIAR has been historically active in this field, particularly with regards to its specialized commodity areas. Gene bank conservation, with its dual objectives, will continue to play a central role in the area of agricultural research. The CGIAR must consider whether it wishes to extend its role to include those of livestock and fish, also in view of FAO activities. We suggest that the efforts include freshwater fish and in livestock that the CGIAR should initially concentrate its activities to selective areas, particularly disease resistance and the smaller ruminants.

Activities specifically related to **conservation** include the following:

#### Collection

- including documentation of the production systems and techniques where specimens are found



Preservation

-including the development of cost-effective technologies for duplicate collections

Evaluation/ assessment

Pre-breeding/genotype enhancement

Documentation

Information dissemination

Improved access to germplasm

Many of the IARCs are already active in many of these fields. Nonetheless, because of the vast quantities of material and areas to be covered, much remains to be done.

Activities dealing with **utilization and exploitation** are listed below. Again, many of the CG centres have extensive experience to build upon in these fields. Nonetheless, many challenges remain, particularly given the world's growing population and the consequent need for increased food supplies.

Enhancement

-adaptation for tolerance and resistance to biotic and abiotic stresses for important crops, particularly durable resistance

-increased yield potential and stability

-input responsive varieties

-increased food quality and diversity

Development of breed improvement strategies appropriate for smallholder production systems

Improve methodology for the utilization of germplasm

Development of methods for smallholder seed production to enhance adoption of improved cultivars

Relevant examples from A21

15.9 c "Improved and diversified methods for *ex situ* conservation with a view to the long-term conservation of genetic resources of importance for research and development."

15.7 h "Promote national efforts with respect to surveys, data collection, sampling and evaluation, and the maintenance of gene banks."

15.6 "Develop methodologies with a view to undertaking systematic sampling and evaluation on a national basis of the components of biological diversity identified by means of country studies;"

15.7 c "Promote technical and scientific cooperation in the field of conservation of biological diversity and the sustainable use of biological and genetic resources. Special attention should be given to the developing and strengthening of national capabilities by means of human resource development and institution-building, including the transfer of technology and/or development of research and management facilities, such as herbaria, museums, gene banks, and laboratories, related to the conservation of biodiversity."

16.25 l "Develop new technologies for rapid screening of organisms for useful biological properties."

#### Chapter 14

Program area G "Conservation and sustainable utilization of plant genetic resources for food and sustainable agriculture"

H. "Conservation and sustainable utilization of animal genetic resources for sustainable agriculture"

#### Chapter 16

Programme Area A. "Increasing the availability of food, feed and renewable raw materials"

### **B. *In situ* conservation and management**

#### Introduction

*In situ* conservation in protected areas is the normal strategy for conservation of wild species. For semi-wild species which depend on certain cultural landscapes and for landraces which depend on a traditional seed supply system, it is less clear how *in situ* conservation could be achieved. Although two approaches have been suggested (the museum approach and the breeding approach), neither has been experimentally tested. Application of these methods will need to be decentralized to the community level, therefore policies and methodologies will need to be compatible with the needs of local communities. In addition the knowledge local people have about plant and animal species and local environments is a valuable resource.

- Develop strategy and methodology including mapping, recording and applying local knowledge. This should include pilot studies.
- Provide technical support
- Provide germplasm from gene banks or breeding programmes for local selection and management
- Serve as the interface between local and institutional conservation and use of genetic resources
- Assist NARS in developing policies

#### Relevant examples from A21

13.7 b (referring to mountain development) "Build an inventory of different forms of soils, forests, water use, and crop, plant and animal genetic resources, giving priority to those under threat of extinction. Genetic resources should be protected *in situ* by maintaining and establishing protected areas and improving traditional farming and animal husbandry activities and establishing programmes for evaluating the potential value of the resources."

11.14 "Establishing, expanding and managing, as appropriate to each national context, protected area systems, which includes systems of conservation units for their environmental, social and spiritual functions and values, including conservation of forests in representative ecological systems and landscapes, primary old-growth forest, conservation and management of wildlife, nomination of world heritage sites under the world heritage convention, as appropriate, conservation of genetic resources, involving *in situ* and *ex situ* measures and undertaking suitable measures to ensure sustainable utilization of biological resources and conservation of biological diversity and the traditional forest habitats of indigenous people, forest dwellers, and local communities;"

12.18 f "Promote *in situ* protection and conservation of special ecological areas through legislation and other means for the purpose of combating desertification while ensuring the protection of biodiversity."

15.9 "Methods and technologies for the conservation of biological diversity and the sustainable use of biological resources;"

## **2. Exploit the existing technological developments arising from research in the biological sciences**

### Introduction

The use of genetic resources by the CGIAR has been subject to considerable public interest in recent years. Much of this relates to issues partly connected to intellectual property rights issues, and partly by the wish of some nations to link availability of genetic material to technical cooperation in the field of modern biotechnology. The presence of CGIAR institutes in developing countries places the CGIAR in a unique position as a facilitator of advanced biotechnology between the industrialised and the non-industrialised worlds. The CGIAR should accept this role of serving as enabling mechanism within the context of international conventions and policies. A particular aspect of this is the use of plant breeding, together with management practices, to obtain better pest control without the need for chemical pesticides (integrated pest management).

-intellectual property rights

-facilitating the use of advanced biotechnology in developing countries

### Relevant examples from A21

16.25 g "Develop applications (of biotechnology) to increase the availability of stress-tolerant planting material for land rehabilitation and soil conservation;"

12.19 b "Develop, test and introduce, with due regard to environmental security consideration, drought resistant, fast-growing and productive plant species appropriate to the environment of the regions concerned."

16.25 f "Develop processes to increase the availability of planting materials, particularly indigenous varieties, for use in afforestation and reforestation and to improve sustainable yields from forests;"

16.25 g "Develop applications to increase the availability of stress-tolerant planting material for land rehabilitation and soil conservation;"

15.4 h "Implement mechanisms for the improvement, generation, development and sustainable use of biotechnology and its safe transfer, particularly to developing countries, taking account of the potential contribution of biotechnology to the conservation of biological diversity and the sustainable use of biological resources."

Chapter 16, programme Area A. "Increasing the availability of food, feed and renewable raw materials. Basis for action: To meet the growing consumption needs of the global population, the

challenge is not only to increase food supply, but also to improve food distribution significantly while simultaneously developing more sustainable agricultural systems. Much of this increased productivity will need to take place in developing countries. It will require the successful and environmentally safe application of biotechnology in agriculture, in the environment and in human health care. Most of the investment in modern biotechnology has been in the industrialized world. Significant new investments and human resource development will be required in biotechnology, especially in the developing world."

Programme Area C "Enhancing protection of the environment 16.23 "The need for a diverse genetic pool of plant, animal and microbial germplasm for sustainable development is well established. Biotechnology is one of many tools that can play an important role in supporting the rehabilitation of degraded ecosystems and landscapes. This may be done through the development of new techniques for reforestation and afforestation, germplasm conservation, and cultivation of new plant varieties. Biotechnology can also contribute to the study of the effects exerted on the remaining organisms and on other organisms by organisms introduced into ecosystems."

Programme Area E "Establishing enabling mechanisms for the development and the environmentally sound application of biotechnology."

### **3. Establish an information base and collaborative networks**

See Human Resource Capacity Development, point 5.

Relevant examples from A21

15.4 i "Promote broader international and regional cooperation in furthering scientific and economic understanding of the importance of biodiversity and its functions in ecosystems."

15.7 a "Consider the establishment or strengthening of national or international capabilities and networks for the exchange of data and information of relevance to the conservation of biological diversity and the sustainable use of biological and genetic resources."

40.6 b "Develop subregional, regional and global networks of PGRFA (plant genetic resources for agriculture) *in situ* in protected areas."

### **4. Assist NARS to develop coherent genetic resource policies**

Introduction

Many NARS appear to require support for the development of national policies relating to genetic resources. This is within the realm of a united CGIAR set of policies.

Relevant examples from A21

14.58g "Strengthen national capacities for utilization of PGRFA (plant genetic resources for agriculture), plant breeding and seed production capabilities, both by specialized institutions and farming communities."

15.4 b "Develop national strategies for the conservation of biological diversity and the sustainable use of biological resources;"

15.4 c "Integrate strategies for the conservation of biological diversity and the sustainable use of biological resources into national development strategies and/or plans."

14.55 "The primary objective is to safeguard the world's genetic resources while preserving them to use sustainably. This includes the development of measures to facilitate the conservation and use of plant genetic resources, networks of *in situ* conservation areas and use of tools such as *ex situ* collections and germplasm banks. Special emphasis could be placed on the building of endogenous capacity for characterization, evaluation and utilization of PGRFA, particularly for the minor crops and other underutilized or non-utilized species of food and agriculture, including tree species for agro-forestry. Subsequent action could be aimed at consolidation and efficient management of networks of *in situ* conservation areas and use of tools such as *ex situ* collections and germplasm banks.

## **5. Stimulate public awareness, also at the policy-making level, for the need to conserve and utilize plant genetic resources**

### Introduction

As a major user of genetic resources the CGIAR also has a major responsibility for ensuring awareness both at government levels and throughout the entire community for the values of such resources. The educational systems of developing countries are particular targets for CGIAR information input.

### Relevant examples from A21:

15.4 e "Carry out country studies, as appropriate, on the conservation of biological diversity and the sustainable use of biological resources, including analysis of recurrent costs and benefits, with particular reference to socio-economic aspects."

15.4 i "Promote broader international and regional cooperation in furthering scientific and economic understanding of the importance of biodiversity and its functions in ecosystems;"

15.10 c "Promote and encourage understanding of the importance of the measures required for the conservation of biological diversity and the sustainable use of biological resources at all policy-making and decision-making levels in Governments, business enterprises and lending institutions and promote and encourage the inclusion of these topics in educational programmes."

Chapter 14 , section G Conservation and sustainable utilization of plant genetic resources for food and sustainable agriculture , and section H and Chapter 16, programme area A Increasing the availability of food, feed, and renewable raw material.

## HUMAN RESOURCES CAPACITY BUILDING

People are central to the process of agricultural development. It is people that evaluate their own needs and priorities in the fields, people that give advice in how these needs can best be met, people that research on how improvements can be made and people who decide on the overall policies. Human resource development recognizes the central role of people and focuses on developing the capacity of both individuals and the links between them and other partners in the process of agricultural development. In recognizing the importance of human resources capacity building, the CGIAR system underlines the importance of understanding both the social and natural sciences in finding sustainable development alternatives.

In recognition of this, TAC has given priority to human resource development. TAC Priority (IX) as presented in Expansion of the CGIAR System, "Strengthen institutions and human resources in national research systems to accelerate the identification, generation, adaptation and utilization of technological innovations."

### 1. Training of research scientists and technicians

#### Introduction

The CGIAR currently uses up to 20% of the combined centres' budgets on training. To date, this training has focused on individuals from government positions. A major concern is that although this training increases the capacity of the individual, it does not appear to have had the desired catalytic effect in increasing NARS' capacity to address their own problems within the field of agricultural research and extension. To redress this, the following recommendations are proposed:

- Promote the use of national university resources in primary industry research in collaboration with the Ministry of Agriculture and other relevant ministries such as the Ministry of Education and the Ministry of Environment (Forests, Fish)
- Involve the NARS in developing effective training programs to ensure that the needs of the NARS are being addressed
- Promote a suitable geographic representation of trainees within individual countries
- Include a monitoring and evaluation component to the training which includes reporting on how information/skills learned at the centre have been disseminated

-Greater utilization of mass media technology both to distribute CGIAR information and as a tool to be used by national extension services

#### Relevant examples from A21

1. 35.20 "Special emphasis must be put on the need to assist developing countries to strengthen their capacities to study their own resource bases and ecological systems and manage them better in order to meet national , regional and global challenges."
2. 14.91 a "Train extension officers and researchers in plant nutrient management, cropping systems and farming systems, and in economic evaluation of plant nutrient impact;"
3. 16.6 d " Acceleration of technology acquisition, transfer and adaptation by developing countries to support national activities that promote food security"
4. 14.51 "Governments at the appropriate level, with the support of relevant international and regional organizations, should train field staff and land users in indigenous and modern techniques of conservation rehabilitation and should establish training facilities for extension staff and land users."
5. 34.13 "A critical mass of research and development capacity is crucial to the effective dissemination and use of environmentally sound technologies and their generation locally. Education and training programmes should reflect the needs of specific goal-oriented research activities and should work to produce specialists literate in environmentally sound technology and with an interdisciplinary outlook. Achieving this critical mass involves building the capabilities of craft persons, technicians and middle-level managers, scientists, engineers and educators, as well as developing their corresponding social or managerial support systems. Transferring environmentally sound technologies also involves innovatively adapting and incorporating them into the local or national culture."
6. 14.41 b "Select combinations of land uses and production systems appropriate to land units through multiple goal optimization procedures, and strengthen delivery systems and local community participation."
7. 12.24 b "Promote efficient extension-service facilities in areas prone to desertification and drought, particularly for training farmers and pastoralists improved management of land and water resources in drylands."
8. 40.11 "Countries, with the cooperation of international organizations, should establish supporting mechanisms to provide local communities and resource users with the information and know-how they need to manage their environment and resources sustainably, applying traditional and indigenous knowledge and approaches when appropriate."
9. 23.2 "... Individuals, groups and organizations should have access to information relevant to environment and development held by national authorities, including information on products and activities that have or are likely to have a significant impact on the environment, and information on environmental protection methods."

## 2. Organize an international information campaign on the importance of research in support of the primary industries

### Introduction

The prospects of agricultural and forestry production being able to keep pace with increasing population are not good in many countries. Investments in research in support of the primary industries have decreased in the last decade. Governments must recognize the importance of research at all levels of development, if this recognition is to be reflected in national budgets and strategies. National awareness must also be raised among the people if activities are to be successful - international agricultural research cannot substitute for active national agricultural research programmes.

- Launch a campaign which highlights the importance and pay-off of investments within the primary industries
- Inform on the interface between agriculture and environment. Such information should reach all relevant ministries.

### Relevant examples from A21

14.10 b "Governments at the appropriate level, with the support of the relevant international and regional organizations, should: b) Examine and undertake surveys and research to establish baseline information on that status of natural resources relating to food and agricultural production and planning in order to assess the impacts of various uses on these resources, and develop methodologies and tools of analysis, such as environmental accounting.

## 3. Stimulate active local participation

### Introduction

There are numerous examples of the importance of including farmers in research from diagnosis and planning through execution and evaluation. Despite clear evidence that this leads to better adoption of new technology, participatory research is still the exception, rather than the rule. Policy options need to be developed to indicate where and in which manner participatory research is the right tool to be used.

At the national level, and in the different agro-ecological regions, adaptive research must be carried out to ensure viability at the local level. It is imperative that this be done in cooperation with the end users, the farmers. The NARS must have a range of appropriate methodologies with which to work. These methodologies should include gender analysis.

- Inform on the importance of participatory diagnosis, research, and testing
- Evaluate/assess existing methods currently used by some IARCs and evaluate their possible use by other centres



-Develop alternatives of participatory methodology that can be adopted under different situations

-Provide training in these methods

Relevant examples on the importance of local participation can be found in virtually every chapter of A21, including the following:

1. 14.22 b " Launch applied research on participatory methodologies, management strategies and local organizations."

2. 14.92 b "Where appropriate, strengthen existing advisory services and train staff, develop and test new technologies and facilitate the adoption of practices to upgrade and maintain full productivity of the land"

3. 14.20 a "appropriate international and regional agencies should: a) reinforce their work with non-governmental organizations in collecting and disseminating information on people's participation and people's organizations and people under occupation, testing participatory development methods, training and education for human resource development and strengthening the management structures of rural organizations;"

32.15 c "Establish mechanisms to increase access of farmers, in particular women and farmers from indigenous groups, to agricultural training , credit and use of improved technology for ensuring food security."

12.33 b "Train extension agents and officers in the participatory approach to integrated land management."

12.37 c "Implement policies directed towards improving land use, managing common lands appropriately, providing incentives to small farmers and pastoralists, involving women and encouraging private investment in the development of drylands."

14.18 e "Develop policies in extension, training, pricing, input distribution , credit and taxation to ensure necessary incentives and equitable access by the poor to production-support services."

14.9 e "Formulate, introduce and monitor policies, laws and regulations and incentives leading to sustainable agricultural and rural development and improved food security and to the development and transfer of appropriate farm technologies, including where appropriate, low-input sustainable agriculture (LISA) systems;

32.8 a "National and international research centres should cooperate with farmers' organizations in developing location-specific environment-friendly farming techniques;"

## **5. Assist in the establishment and administration of collaborative research networks and information bases**

### **Introduction**

A vast amount of information has been produced throughout the world, but it is not easily accessible. In addition, many people are working on similar problems

and would benefit by being able to exchange thoughts. Networks can assist in centralizing information, as well as opening doors for collaboration.

-Develop networks within the areas of genetic resources, soil and water and human resource management in agricultural research

-Relevant examples from A21

14.38 a "Collect, continuously monitor, update and disseminate information, whenever possible, on the utilization of natural resources and living conditions, climate, water and soil factors, and on land use, distribution of vegetation cover and animal species, utilization of wild plants, production systems and yields, costs and prices, and social and cultural considerations that affect agricultural and adjacent land use;"

34.8. "The primary goal of improved access to technology information is to enable informed choices, leading to access to and transfer of such technologies and the strengthening of countries' own technological capabilities."

12.12 b "Develop integrated information systems for environmental monitoring, accounting and impact assessment."

12.38 "Governments at the appropriate level, and with the support of the relevant international and regional organizations, should promote information exchange and cooperation with respect to national planning and programming among affected countries, *inter alia*, through networking." (referring to desertification/ land degradation)

12.58 c "Disseminate knowledge about applied research results on soil and water issues, appropriate species, agricultural techniques and technological know-how."

40.19 "Existing national and international mechanisms of information processing and exchange, and of related technical assistance, should be strengthened to ensure effective and equitable availability of information generated at the local, provincial, national and international levels, subject to national sovereignty and relevant intellectual property rights."

14.48 b "Establish regional and subregional networks for scientists and technicians to exchange experiences, develop joint programmes and spread successful technologies on land conservation and rehabilitation."

Chapter 31 Programme Area A. "Improving communication and cooperation among the scientific and technological community and decision makers and the public."

## **6. Incorporate a gender framework into CGIAR programmes, policies and staffing**

### Introduction

Gender analysis, being a further refinement of a user perspective, leads to increased efficiency in technology development.

See the CGIAR Gender programme, 1992

1. Provide a firm grounding for the social sciences in agriculture through the development of relevant institutional structures.
2. Design strategies to ensure men and women are better integrated into development efforts
3. Incorporate the gender variable in research methods and analysis
4. Provide training for both CGIAR staff at all levels and NARS in gender analysis
5. Engage more women professionals in the ranks of IARC scientific staff, management and boards
6. Increase the number of women from NARS in IARC training programmes

#### Relevant examples from A21

10.10 "Governments at the appropriate level, in collaboration with national organizations and with the support of regional and international organizations, should establish innovative procedures, programmes, projects and services that facilitate and encourage the active participation of those affected in the decision-making process, especially of groups that have, hitherto, often been excluded, such as women, youth, indigenous people and their communities and other local communities."

12,58 a "Review, develop and disseminate gender-disaggregated information, skills and know-how at all levels on ways of organizing and promoting popular participation;"

24.2 b "To increase the proportion of women decision makers, planners, technical advisers, managers and extension workers in environment and development fields;"

24.2 e "To assess, review, revise and implement, where appropriate, curricula and other educational material, with a view to promoting the dissemination to both men and women of gender-relevant knowledge and valuation of women's roles through formal and non-formal education, as well as through training institutions, in collaboration with non-governmental organizations;

## 7. Policy Research

### Introduction

It is widely recognized that the general political and economic framework within which agriculture and forestry function, is of paramount importance for the primary industries. Support to socioeconomic policy research is leading to improved understanding of the underlying causes of environmental degradation and to identification of policy reforms that will help to foster sustainable land and aquatic resource use.

-Provide leadership in the study of political and economic factors related to developments of agriculture, fisheries and forestry in developing countries, particularly relating to smallholder conditions.

-Study underlying causes of problems in order to suggest remedial policies

Relevant examples from A21

14.9 e "Formulate, introduce and monitor policies, laws and regulations and incentives leading to sustainable agricultural and rural development and improved food security and to the development and transfer of appropriate farm technologies, including where appropriate, low input sustainable agriculture (LISA) systems;

14.18 e "Develop policies in extension, training, pricing, input distribution, credit and taxation to ensure necessary incentives and equitable access by the poor to production-support services;

32.15 c "Establish mechanisms to increase access of farmers, in particular women and farmer from indigenous groups, to agricultural training, credit and use of improved technology for ensuring food security.

24.8 f "Measures to develop and include environmental, social and gender impact analyses as an essential step in the development and monitoring of programmes and policies;

24.3 f "Programmes to support and strengthen equal employment opportunities and equitable remuneration for women in the formal and informal sectors with adequate economic, political and social support systems and services, including child care, particularly day-care facilities and facilities and parental leave, and equal access to credit, land and other natural resources;"

24.7 d "Analysis of the structural linkages between gender relations, environment and development;"

## MODES OF IMPLEMENTATION

Once approved by the CGIAR, TAC will have the role of overseeing the implementation of this plan. TAC should assign particular responsibilities to some IARCs for each of the three programmes and invite the selected IARCs to assume responsibility for coordination. These lead IARCs are expected to enlist the support of other IARCs in the implementation of the plan, and also seek cooperation with non-associated centres.

The CGIAR Secretariat is expected to liaison with UNCED follow-up mechanisms and be responsible for a public awareness campaign to inform on the CGIAR efforts in implementing A21.

The suggested division of responsibilities are:

### **Soils and water:**

**Overall coordinator:** ICRISAT  
 for Asia: ICRISAT  
 for Africa: IITA  
 for Latin America and the Pacific: CIAT

### **Genetic Resources:**

**Overall coordinator:** IBPGR  
 for plants: IBPGR  
 for animals: ILRAD  
 for fish: ICLARM  
 for policy: ISNAR

### **Human Resources Capacity Building:**

**Overall coordinator:** ISNAR

Appendix 1 offers some suggestions for discussion as to the type of activities on which the lead IARCs may wish solicit support from other IARCs during the efforts to operationalize programs and projects in line with A21.

In addition to this system-wide initiative for selecting particular themes for CGIAR emphasis on implementation of A21, individual IARCs are currently and independently developing their own plans for follow-up to A21. The CGIAR welcomes this, and sees these efforts as complementary and additional to the suggested focused CGIAR profile on A21.

## Appendix 1

Some suggestions as to which IARCs the lead IARC may wish to draw on when implementing the main themes as follow-up to A21:

### Soils and water - ICRISAT (Asia:ICRISAT/ Africa:IITA/ LatinAmerica and the Pacific:CIAT)

1. Exploit underutilized tropical "problem" soils  
IRRI, ICARDA, ICRAF, ILCA, (IBSRAM)
2. Improve soil fertility  
IRRI, ICARDA, CIMMYT, ICRAF, ILCA, (IBSRAM)
3. Improve soil management/conservation  
IRRI, ICARDA, CIMMYT, CIP, ICRAF, IIMI, CIFOR, IFPRI (IBSRAM)
4. Develop methods for the rehabilitation of degraded lands (saline/  
acid/toxic/severely eroded)  
IRRI, ICARDA, ICRAF, IIMI, CIFOR, (IBSRAM)
5. Assess the possible effects climate change will have on soil  
IRRI, ICRAF, CIFOR
6. Develop principles and methods for sustainable management of water  
resources  
IIMI, IRRI, ICARDA, IITA, ICLARM
7. Develop methods for improved soil and water management  
All centres

### Genetic resources - IBPGR (plants:IBPGR/ animals:ILRAD/ fish:ICLARM)

1. Conserve the genetic resource base  
Plants: ICARDA, ICRISAT, IRRI, CIP, CIAT, INIBAP, CIMMYT, IITA,  
WARDA, ICRAF, CIFOR  
Animals: ILCA, (ITC)
2. Exploit the existing technological developments arising from research in the  
biological sciences  
ISNAR, CIMMYT, ICRISAT, ILCA, IRRI, CIP, CIAT, ICARDA
3. Establish an information base/network  
ISNAR
4. Assist NARS to develop coherent plant genetic resource policies  
ISNAR
5. Stimulate public awareness, also at the policy-making level, for the need to  
conserve and utilize plant genetic resources  
ISNAR, IFPRI, IRRI, ICRISAT, CIP, CIMMYT, ICARDA, ICRAF, CIFOR

### Human Resources Capacity Building - ISNAR

1. Training  
All centres
2. Organize an international information campaign on the importance of  
agricultural research  
CGIAR Secretariat, all centres
3. Stimulate active local participation  
All centres

4. Assist in the establishment and administration of collaborative research and information networks  
All centres
5. Incorporate a gender framework into CGIAR programmes, policies and staffing  
CGIAR Secretariat, all centres
6. Policy research  
IFPRI

Unced Tac 6.4

**Agenda item 13**  
**Progress Report on Possible Follow-Up Action on UNCED Agenda 21**

24 May 1993

Introduced by  
Stein W. Bie, NORAGRIC, Norway

Mr. Chairman,

At International Centres Week last October you asked me to develop further proposals as to how the CG system could respond to the call contained in UNCED's Agenda 21 for the international research community to consider specific ways in which the research community could contribute towards the implementation of Agenda 21. You may recall that Agenda 21 clearly wishes the existing global and national research structures to accept these challenges, rather than to propose the creation of new structures. We all know the allergies the donor community now has towards new institutional constructions. The donor community clearly feels that whatever money it may have available for implementation of Agenda 21 - and that may be somewhat less than what many may have hoped for prior to Rio - that this money is best used through existing structures.

I believe, Mr. Chairman, that at some stage there have been people within the CG system who may have looked upon Agenda 21 money as potentially new money to fill the now apparent gap between CGs scientific ambitions and funding realities. The idea was to convey to the donor community that the CGIAR was doing Agenda 21 stuff anyway, and therefore deserved Agenda 21 money to carry on the good work.

Cassandra Bergstrøm and I, who prepared this report for you, with the economic support of fresh non-CGIAR funds from the Norwegian Ministry of Foreign Affairs, approached the matter differently. Our initial soundings within the donor community, going beyond the sections that normally provide CG funds, convinced us that presenting old and on-going CG-work in new and green wrapping, would not release environmental Agenda 21 funds, whether from bilateral donors, or from multilateral environmental funds.

The message to us from these donors was very clear: read Agenda 21 carefully, and identify in programme or project form, where the CGIAR can undertake tasks specifically outlined in Agenda 21.

Now, the CGIAR is an agricultural research mechanism. Its task at present is to make the world understand that it is a historical fact that without significant productivity increases in the primary industries sector very few countries have been able to create economic progress. And if we look to the developing world to-day, those countries that are most



successful in their economic development, e.g. in Asia, are just those that have build a sound foundation by investing heavily in agricultural research and extension. Similarly, those countries that have not done so, and many African countries fall into this category, have failed to make much progress. The CGIAR provides significant research input that allows the basis of the pyramid where primary industries is a productive sector supporting secondary and tertiary productive activities. The CGIAR has this mandate, and will remain a research institution with responsibility for the primary industries of agriculture, forestry and fisheries. With the donor community preoccupied with the negative connotations of agriculture in the industrialized countries : overproduction, meat mountains, butter mountains, wine and milk lakes, costly subsidies, protective tariffs, it is our duty to remind them of the realities of the poor world where the primary industries are fundamental, as they were in the industrialized countries 50, 100 and 200 years ago. This is framework of the CGIAR mandate, and the CGIAR should stick to this as its primary task.

But the CGIAR has a unique opportunity at a time when centres have a surplus of facilities and qualified staff, to offer to take on a new and additional portfolio. This new portfolio does not originate in the CGIAR mandate, but it originates in Agenda 21. Agenda 21 has a huge potential portfolio in its 40-odd chapters.

What we have done in our report is to read through Agenda 21, and with our knowledge of the inner strengths and weaknesses of the CG system, tried to identify a limited Agenda 21 portfolio for which the CGIAR may have a global advantage compared to other existing research institutions.

In our selection of items for the portfolio we were greatly aided by John Spears' paper at last Centres Week. We did feel, however, that his 10 points looked much more like an agricultural research portfolio than an Agenda 21 portfolio. We also felt that 10 items, of highly varied size and nature, would not focus donor attention to the potential of CGIAR as a credible mechanism for Agenda 21 work. They could be good arguments for giving more money for agricultural research, but we doubted, after having listened to at least some donors, whether they in their original form would be of prime importance to the custodians of Agenda 21 funds.

The paper before you has the following arguments for an offer from the CGIAR to the world community in general and the Agenda 21 donors specifically to undertake a limited Agenda 21 portfolio in addition to CGIAR's traditional research for the primary industries:

1. Let the CGIAR undertake a global programme on the Earth's soil and water resources

2. Let the CGIAR undertake a global programme on useful plant and animal genetic resources

3. Let the CGIAR play a main role in creating and mobilizing human resources on management of natural resources, and build on the institutions that keep knowledge in trust.

The Soils and water programme recommends 7 items that are found to be important in Agenda 21 and for which the CGIAR has significant expertise:

- [1. Exploit underutilized tropical "problem" soils
2. Improve soil fertility
3. Improve soil conservation
4. Develop methods for the rehabilitation of degraded lands
5. Assess the possible effects climate change may have on soil
6. Develop principles and methods for sustainable management of fresh water resources
7. Develop methods for improved soil and water management.]

The Genetic Resources Programme has 5 items:

- [1. conserve the genetic resource base, incl. in situ and ex situ conservation of useful plants and animals
2. Exploit technological developments arising from biological research
3. Establish an information base and collaborative networks
4. Assist NARS to develop coherent genetic resource policies
5. Stimulate public awareness for the need to conserve and utilize plant genetic resources.]

The Human Resources Capacity Building Programme has 7 items:

- [1. Training of research scientists and technicians, particularly in cooperation with national universities
2. organize an international information campaign on the importance of research in support of the primary industries
3. Stimulate active local participation
4. Assist in the establishment and administration of collaborative research networks and information bases
6. Incorporate a gender framework into CGIAR programmes, policies and staffing
7. Undertake policy research.]

In other words - the proposal is this: let the CGIAR come forward with these 3 programmes on soils and water, genetic resources and human resources capacity building, and offer to undertake these.

Now, this proposal has a somewhat novel aspect: we suggest that the CGIAR in the case of Agenda 21, actually operates as a contract partner to the world community. Contracts that Agenda 21 donors sign are with the CGIAR Secretariat. We suggest that the CGIAR, through the ultimate wisdom of its TAC, then assigns responsibilities to consortia of centres for each programme. We have, on p. 26, actually suggested to TAC how it could identify prime centres for each of the three programmes. And to be sure that nobody, at least not TAC,

could accuse us of not being willing to bite the bullet, we have actually suggested in Appendix 1 (p.27) what the centre consortia could look like. A number of centre directors and a number of centre scientists have challenged the organizational suggestions, and probably rightly so. TAC may be able to suggest alternative solutions. We do not think that it is to the benefit of the CGIAR system that its component centres scurry around like squirrels trying to compete against each other for smaller Agenda 21 nuts. However, we do see opportunities for carrying out the proposed programmes via other organizational structures, e.g. where centres or consortia of centres act on their own.

We believe the 3 programmes represent Agenda 21 fields where the CGIAR could do well as a contractor to the world community. The CGIAR has spare capacity at the moment - it could put this to good use. The fields are incidentally also fields where the CGIAR itself could benefit, particularly in its strives towards sustainability research and ecoregional mechanisms. We know that there are major activities in other international and national organizations, including among the co-sponsors to CGIAR, to position themselves for Agenda 21 tasks, and also in the fields of soils, water, genetic resources and human resources development. We think CGIAR could compete favourably in these fields, as a contractor on its own, or as a subcontractor to other organizations that will undertake Agenda 21 tasks.

I know that most of you have read the paper, that I have now outlined to you. I leave it now, Mr. Chairman, to you to see whether these system-entrepreneurial ideas are attractive to you and our colleagues. Let me end where I started: I believe it is a mistake for the CGIAR to think it will automatically attract Agenda 21 funds to our new Medium Term Plans just because we have used Agenda 21 words. I believe Agenda 21 deserves Agenda 21 proposals, not centre medium term plans. And I believe that unless the donor community notices that CGIAR is serious about Agenda 21, it may be even more difficult to attract ordinary old-fashioned agricultural research money for our ordinary CGIAR centre medium term plans. If the CG fails to respond, the donor community may overcome its allergy against creating new and alternative institutions. New institutions will ultimately further marginalize international agricultural research.

Thank you, Mr. Chairman

(due to time limitations a number of sections were omitted during the actual oral presentation. These sections are denoted within the text by [])