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PROGRAMME COMMITTEE

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Evaluation of FAO Activities in Crop Production

Table of Contents

	Pages
Executive Summary	1
I. Introduction	2
CONTEXT FOR THE EVALUATION	2
ROLE OF FAO IN CROP PRODUCTION	3
II. Scope and Methodology for the Evaluation	4
<i>Scope</i>	4
<i>Methodology</i>	5
III. Overview of FAO's Work on Crop Production within AGP	6
REGULAR PROGRAMME STRUCTURE	7
EVOLUTION OF FAO'S WORK IN CROP PRODUCTION	8
REGULAR PROGRAMME RESOURCES	9

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FIELD PROJECTS	10
IV. Assessment of Priorities for FAO Work in Crop Production	11
QUESTIONNAIRE SURVEY	11
REGIONAL PRIORITIES	13
V. Assessment of Results – Regular Programme	13
NETWORKS	14
PUBLICATIONS	15
DATABASES	15
SECRETARIAT FUNCTIONS	16
JOINT FAO/IAEA DIVISION (AGE): SUSTAINABLE INTENSIFICATION OF CROP PRODUCTION SYSTEMS THROUGH TECHNOLOGIES AND CAPACITY BUILDING	17
VI. Assessment of Results – Field Programme (Including TCP)	19
QUALITATIVE ASSESSMENT	19
ISSUES RELATED TO FIELD ACTIVITIES	20
<i>Coherence of FAO Projects in a Country</i>	20
<i>Synergies and Institutional Collaboration</i>	20
<i>Limitations of TCP Format</i>	20
<i>Economic and Marketing Considerations</i>	21
<i>Farmers' Field Schools</i>	22
<i>Evaluation of training effectiveness</i>	22
<i>Operational Constraints</i>	22
<i>Joint FAO/IAEA Division Projects in Crop Production</i>	22
VII. Conclusions and Recommendations	22
STRATEGIC ORIENTATION OF FAO CROP PRODUCTION ACTIVITIES	22
FIELD ACTIVITIES	25
Appendix	29
FAO FIELD PROJECTS REVIEWED BY EVALUATION MISSIONS	29
Annex 1	31
REPORT OF THE EXTERNAL PEER REVIEW PANEL	31
<i>General Observations</i>	31
<i>Recommendations</i>	31

PC 90/3a)	iii
<hr/>	
Annex 2	34
MANAGEMENT RESPONSE (AG DEPARTMENT)	34

Executive Summary

i. The evaluation focuses on those aspects of FAO's crop production work under the responsibility of the Plant Production and Protection Division (AGP), with particular emphasis on those programme entities primarily implemented by the Crop and Grassland Service, and the Joint FAO/IAEA Division (AGE). It covers both the Regular Programme and Field Programme, including the Technical Cooperation Programme (TCP) which now constitutes the bulk of the field activities. The evaluation was carried out through interviews at FAO headquarters, some Regional Offices and in 14 selected countries from all regions of the world. Missions contacted national and local Government officials, project implementing officers, farmer/beneficiaries and national and international research bodies. Data was also gathered through questionnaire surveys, which were conducted among member countries, national scientific institutes, international agricultural research centres and donors.

ii. Main findings: FAO's work in crop production has changed considerably over the past decade. For many years, there was a large Field Programme to support and relatively little attention was given to the Regular Programme. Now, with the decline of the Field Programme and change to a new programming model for the Organization from 2000, the Regular Programme has become comparatively more important than it was. The Crop and Grassland Service (AGPC) has traditionally worked along disciplinary lines, but the current problems and FAO's development philosophy now place much more emphasis on inter-disciplinary problem identification and solutions. FAO's work in crop production has made some movement towards working along these lines, but much remains to be done. The present evaluation's recommendations are intended to enhance the focus on key development problems in crop production and re-inforce interdisciplinarity. The recommendations, if accepted, will be evidenced in the Medium-Term Plan for 2006-11 and Programme of Work and Budget for 2006-07.

iii. The Field Programme, in contrast to past years, is now largely composed of TCP projects. Most of those assessed in the field were found to be good and have led to identifiable improvements in the crop production situation in beneficiary countries. Country projects were particularly effective when unified around particular themes (e.g. Farmers' Field School (FFS), Special Programme for Food Security (SPFS)). Evaluation missions did find a number of issues that need to be considered in the future development of activities. These included:

- a) Suitability of TCP format (with time limitations) for some crop promotion activities that inherently require more than two years;
- b) Definition of target groups in projects and the need for a policy decision on promotion of technologies that do not directly benefit the very poorest farmers;
- c) More selectivity in selection of inputs to projects;
- d) More explicit consideration of economic and marketing aspects in technology promotion;
- e) Need to coordinate better on projects using the FFS approach and monitor results of various training and extension approaches used.

iv. Major recommendations: Eventually, FAO's crop production work should be organized in a multi-disciplinary manner, so that production systems can be better understood and FAO can act more as an adviser on policy and strategic development. The Crop and Grassland Service should be reorganized on the basis of project/programme teams responsible for major tropical production systems/agro-ecologies. Considering the high priority given by a wide range of member countries, it is recommended to develop a crop/livestock production systems Technical Project (TP) in a particular selected agro-ecological setting as a useful pilot case to learn how to best move in this new direction. This Technical Project should begin not later than 2006.

v. The evaluation also recommends additional components in two Regular Programme Technical Projects in areas found to be of particular interest to member countries. One is to raise

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strategic awareness and promote appropriate policy and technical initiatives related to plant breeding, a key area requiring strengthening in many countries. The other is to include a specific focus on horticulture within the TP on alternative crops. This project should include critical elements in production and commercialization (e.g. marketing, post-harvest value-added) and evidence a good understanding of the specific requirements of the different regions and countries. Because of interest shown in the topic, FAO should continue to develop the necessary protocols and related practices for the practical and effective implementation of Good Agricultural Practices.

vi. Biotechnology is an increasingly important topic and the evaluation has recommended that expertise in plant biotechnology should be brought within the Plant Production and Protection Division, with AGE to continue to provide support to research and technical training/capacity building.

vii. The evaluation recommends closer ties with CGIAR institutes, especially in view of the change in their mandates, which now more closely resemble that of FAO. The evaluation recommends formation of joint working groups on subjects of common interest where there is mutual benefit to be derived from such cooperation (as opposed to seeking additional funding).

viii. The evaluation also recommends an examination of crop production networks, with a view to making some of them more self-supporting with other sources of funding, and withdrawing support from those which are unlikely to continue without indefinite FAO support. It also recommended a more critical approach to production of publications.

ix. For TCP projects, the evaluation recommends an examination of their appropriate role in development of normative work and as a result, conditions applied in their implementation. These include time limits for those which cannot be completed in two years (which may often be the case for those that support normative work), types of target beneficiaries (which may not always be most disadvantaged) and the amount of international consultancy that may be required in certain specialized activities. In line with some of the recommendations above, field projects should evidence that economic and marketing perspectives have been considered and included within the project if appropriate and that provision should be made in projects for monitoring of training (including the performance of modified FFS approaches).

I. Introduction

CONTEXT FOR THE EVALUATION

1. FAO has a long history of carrying out evaluations of its technical programmes. Until 2000, technical programmes were usually evaluated in connection with preparation of the *Programme Evaluation Report* or its precursor, the *Review of the Regular Programme*, documents that were submitted to the ~~bi-annual~~biennial FAO Conference. These reviews were for the most part conducted as desk studies, although occasionally some special topics would be covered in greater detail, including in-depth field assessments of work conducted at country level.

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2. In recent years, the methodology and depth of coverage of technical programme reviews have altered considerably. Reasons for this included a greater realization within FAO of the need to improve programme design and implementation and more conclusively show results. Evaluation can be an effective management tool for doing this. At the same time, there was a demand from the Governing Bodies for more in-depth and strategically-focused evaluation work.

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3. In 1997, FAO began annual thematic evaluations of TCP projects, in order to improve such projects in the future. In 2000, with the adoption of the new programming model and the Strategic Framework, it was decided that these evaluations should be broadened, to examine work in the same area carried out, besides TCP, under the Regular Programme and through other field projects. The first such exercise, ~~in 2000~~, was done on FAO's work on Policy Assistance to Member Governments, in 2000, and the second, on Animal Health, was carried out in 2001. In

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2002, the thematic evaluation including TCP looked for the first time at an entire Strategic Objective of the Organization, relating to Emergencies.

4. Topics for evaluation are considered by the **FAO** Programme Committee and recommended to the Director-General, who makes the final selection. At its September 2001 session, the Programme Committee selected FAO's activities in Crop Production as one of the topics to be evaluated, since this was considered an important FAO programme and no in-depth evaluation of it had been undertaken since 1990. The Director-General subsequently confirmed the choice and this evaluation was thus inserted in the work programme of the Evaluation Service for 2002-03.

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ROLE OF FAO IN CROP PRODUCTION

5. Ensuring food security and increasing farm incomes have been objectives of FAO from its beginning and a key element of this is increasing and diversifying crop production.

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6. Historically, crop production has been a topic of major interest to FAO member countries, and one in which developing countries have always made numerous requests for assistance. In fact, the last time the subject of Crop Production was reviewed in depth by the Evaluation Service (*Review of the Regular Programme 1990-91*, Chapter 8 "Crop Improvement and Management"), it was noted that the crop production sub-programme backstopped more projects than any other in FAO, averaging over 220 per year in the late 1980s.

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7. FAO provides services in crop production in several ways, including:

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- Technology transfer and training;
- Providing neutral fora;
- Providing information; and
- Promoting strategic crop research and development initiatives.

8. **Technology transfer and training** is largely done through projects, predominantly TCP at present but also external funding sources (Trust Funds), TeleFood, the Special Programme for Food Security and, to some extent, the Regular Programme (often linked to field activities). Contributions to networks, a significant means of action, also fall under this heading.

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9. FAO's crop production activities also include **providing fora** for international exchange of opinion and discussion on scientific matters. Historically, the most important forum has been the International Rice Commission, which began in 1949 and has developed a large body of work over the years. Other important fora include the Tropical Asian Maize Network and the Network on Plant Biotechnology for Latin America and the Caribbean (RedBio).

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10. FAO traditionally has carried out **provision of information** through written publications but **is it** increasingly includes multimedia and Web-based information production.

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11. Finally, FAO promotes **strategic crop research and development initiatives**, particularly through cooperation with International Agriculture Research Centres and national programmes. FAO's work on the Global Cassava Development Strategy and on plant breeding falls in this area.

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12. As can be seen from the above, FAO's involvement in crop production takes many forms. It also cuts across the work of several technical divisions. It includes plant nutrition, which is an important and integral part of crop production. This work is under the Land and Water **Development** Division (**AGL**), as is all of FAO's work related to water availability for crops, including through irrigation. Advice on extension methods is another important aspect of crop production, which falls largely under the Extension, Education and Communication Service (SDRE) of the Sustainable Development Department (SD), though AGP has taken a lead role in developing the Farmers' Field School approach to extension, which is becoming widely used inside and outside of FAO. The Environment and Natural Resources Service (SDRN) is

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responsible for FAO's work on agro-meteorology, another important aspect of crop production. Work to improve the organizational aspects of national and regional research programmes is under the Research and Technology Development Service (SDRR). Farming systems oriented development, along with marketing and rural finance, is located in the Agricultural Management, Marketing and Finance Service (AGSF). Work on improving mechanization within crop production, along with post-harvest processing and loss reduction, are situated in the Agricultural and Food Engineering Technologies Service (AGST). Work related to crop/livestock systems (e.g. feed improvement) is carried out in conjunction with the Animal Production Service (AGAP). Specific crop germplasm improvement programmes in which nuclear applications are involved (e.g. mutation breeding) are supported by the Joint FAO/IAEA Division (AGE), based in Vienna.

13. However, the main responsibility for crop production within FAO is in the ~~Plant Production and Protection Division (AGP)~~ although it is evident from the above that for the effective implementation of its responsibilities, ~~AGP~~the division requires close interaction with other FAO units. AGP is divided into three Services: the Plant Protection Service (AGPP), the Seed and Plant Genetic Resources Service (AGPS) and the Crop and Grassland Service (AGPC). While all the Services of AGP deal with aspects of crop production, the one most directly concerned with production is AGPC. From an institutional perspective, the present evaluation examines all the work of AGPC and selected aspects most directly related to crop production of the other AGP Services, plus the work of AGE that is related to crop production (see Scope below).

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II. Scope and Methodology for the Evaluation

Scope

14. One of the first tasks of this exercise was to define the scope of the evaluation, as a great deal of FAO's work is related to Crop Production. There was a need for practical reasons to limit the scope of the investigation to manageable size, taking into account time and resources available.

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15. Since FAO's work is now cast within the Strategic Framework, this was the point of departure for defining the scope of the study. Crop Production, however, does not fit neatly into any single Strategic Objective of the Organization. Primarily, Crop Production is addressed through Strategic Objective C2 "Adoption of appropriate technology to sustainably intensify production systems and to ensure sufficient supplies of food and agricultural, fisheries and forestry goods and services". Work on Crop Production is also reflected to a degree in the following Strategic Objectives:

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- A.2, "Access of vulnerable and disadvantaged groups to sufficient, safe and nutritionally adequate food";
- B.2, "National policies, legal instruments and supporting mechanisms that respond to domestic requirements and are consistent with the international policy and regulatory framework";
- C.1, "Policy options and institutional measures to improve efficiency and adaptability in production, processing and marketing systems, and meet the changing needs of producers and consumers";
- D.2, "Conservation, rehabilitation and development of environments at the greatest risk"; and
- E.1, "An integrated information resource base, with current, relevant and reliable statistics, information and knowledge made accessible to all FAO clients".

16. FAO's Strategic Framework (SF), which covers the period 2000-2015, contains broad organizational priorities, while the Medium-Term Plan (MTP) is the concrete expression of the SF in terms of activities to be carried out over the next six years. Prepared as a rolling plan every two years, the priorities in the MTP provided a more useful basis for determining the scope of the

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exercise. MTP priorities are, for the most part, closely linked to the work of particular organizational units. For Crop Production, the most important MTP priorities appeared to be (under Programme 2.1.2 Crops):

- Alternative Crops and Cultivars for New Opportunities;
- Strategies and Technologies for Sustainable Crop and Grassland Production Systems;
- Mainstreaming Integrated Pest Management (IPM) by Enhancing Essential Ecological Processes;
- Strengthening National Seed Production and Security Systems;
- Support to Strategy Formulation and Promotion of Specific Action for Rice Development in Member Countries of the International Rice Commission;

(and under Programme 2.1.5 Agricultural Applications of Isotopes and Biotechnology):

- Sustainable Intensification of Crop Production Systems through Technologies and Capacity-Building.

17. The first five priorities are under the organizational responsibility of the ~~Plant Production and Protection Division (AGP)~~, in particular the Crop and Grassland Service (AGPC), ~~(AGPC)~~ but also some work, particularly that related to IPM, is carried out by the Plant Protection Service (AGPP) ~~(AGPP)~~ and some by the Seed and Plant Genetic Resources Service (AGPS) ~~(AGPS)~~. The work under Programme 2.1.5 is primarily under the responsibility of the ~~Joint FAO/IAEA IAEA-FAO Joint~~ Division (AGE). Upon further examination, it was found that these priorities represented a considerable body of work by FAO and it was therefore decided that the areas mentioned in the bulleted points above would constitute the specific focus for this evaluation.

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18. As with previous technical programme evaluations, the time frame for the evaluation was the previous three biennia, i.e. work dating back to 1996. This pre-dates the Strategic Framework. However, the priorities expressed in the Medium-Term Plan have been present in FAO's work dating back to 1996 and even before, and therefore the change in programme structure did not pose a problem for the conduct of the evaluation.

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19. At the time the evaluation was beginning, AGPC was in the process of re-shaping its work along thematic, interdisciplinary lines. Although not formally endorsed yet, the evaluation took account of these proposed priorities in analyzing the programme, especially for future priorities. All the thematic areas are broadly covered in the MTP priorities listed above.

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20. The evaluation is not a compendium of all the work that FAO has done in crop production, or even all the work done by AGPC. Certain particularly important outputs are cited, but the evaluation is primarily intended to take stock of the programme over the past six years, drawing on examples where needed, and making recommendations for future orientations.

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Methodology

21. The evaluation was conducted under the responsibility of the FAO Evaluation Service (PBEE). PBEE prepared the initial draft terms of reference, developed the questionnaires that were sent to national ~~E~~governments and institutions, donors and implementing partners, initiated the organization of field missions and prepared the mission report. The process was consultative, involving AGP at all crucial junctures. By any measure, the cooperation was fruitful and collegial. To ensure independence and to bring necessary technical skills to the evaluation, four independent consultants were engaged; one in each of the regional missions¹. Further external input was assured through the participation of the External Peer Review Panel that examines and comments upon the report, and whose report is an integral part of the documentation that is submitted to the FAO Governing Bodies.

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¹ Latin America and Caribbean: Eduardo Trigo (Argentina); Africa: Lukas Brader (Netherlands); Near East/Europe: Surendra Beniwal (India); Asia: Jan Erikson (Sweden). Dr. Beniwal also participated in the mission to the ~~Joint FAO/IAEA IAEA-FAO Joint~~ Division; Dr. Brader assisted the Evaluation Service in the final report writing.

22. The evaluation methodology had four principal components. After agreement on the terms of reference, work began on information-gathering and interviews with responsible FAO officers. The main purpose was to establish an information base on subjects to be reviewed in depth, both in the Regular and Field Programmes, and to obtain views of concerned staff on programme priorities, successes and areas in need of improvement. Consultations were carried out also on points for inclusion in the questionnaires and selection of countries for field mission visits. These consultations included staff from all Regional Offices² and the Sub-Regional Office for Eastern and Southern Africa.

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23. In order to have input from FAO member countries, a questionnaire survey was prepared and distributed. Additional questionnaires were sent out to national agricultural institutions (primarily research) and to relevant CGIAR institutes. The analysis of the questionnaires is found in Section IV of this report.

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24. Questionnaires, however, are not sufficient and the main part of the evaluation was four field missions, to a total of 14 countries³ in all regions. The missions met with key informants (Government officials, donor representatives, project implementing partners, project beneficiaries, including farmers) in order to assess crop production priorities, knowledge about FAO's crop production programmes, use of FAO-produced outputs from both the Regular and Field Programmes and to gauge follow-up and impact of FAO's activities. Depending on the volume of work, country visits lasted 5-9 days each. Each mission produced a regional report, with general conclusions, overall reports on each country and an assessment of each individual field activity reviewed.

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25. This report has been examined by the External Peer Review Panel⁴, which commented on the report quality and noted the recommendations that seem particularly appropriate. The Panel also addressed any gaps it felt that the evaluation report should have addressed. The Evaluation Report and External Peer Review Panel Report were then submitted to FAO Management for its reaction, including how it is proposed to implement agreed recommendations. All three documents (Evaluation Report, External Peer Review Panel Report and Management Response) will be reviewed and commented upon by the FAO Programme Committee at its September 2003 session. After review by the Programme Committee, all the documents (including the Programme Committee's report) will be submitted to the FAO Council and Conference.

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III. Overview of FAO's Work on Crop Production within AGP

26. Within AGPC at FAO Headquarters, work is divided among four commodity groups. This form of organization has not changed over the years. The groups are:

- Field Food Crops
- Industrial Crops
- Horticultural Crops
- Grassland and Pasture Crops

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27. In addition to the Groups (all of which have at least one Senior Officer), there are staff working on cross-cutting issues such as biotechnology and conservation agriculture. AGPC also provides the Secretariat of the International Rice Commission.

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² Consultations with the Regional Offices for the Near East and Asia/Pacific took place during field missions to those regions; other officers were met at FAO headquarters.

³ Latin America and Caribbean - Cuba, Peru, Brazil; Africa - D.R. Congo, Kenya, Ethiopia, Burkina Faso; Near East/Europe - Syria, Egypt, Georgia; Asia - India, Vietnam, China, Thailand.

⁴ Panel members were: Dr. Alberto Duque Portugal, former Director, EMBRAPA (Brazil), Dr. Geletu Bejiga, Director of Field Crops Research, Ethiopian Agricultural Research Organization, Dr. Raj Paroda, Coordinator of Central Asia and Caucasus Programme, ICARDA (India), Dr. Lukas Brader, former Director-General, IITA (Netherlands), Ms Jamie Watts, Evaluation Specialist, IPGRI (USA).

28. Recently, AGPC has been engaged in efforts to define the approach to its work in a more thematic way, making more evident how it addresses crop production problems in an inter-disciplinary fashion. This includes working with other AGP units and other technical divisions, including through FAO's Priority Areas for Inter-disciplinary Action (PAIAs) and Inter-Departmental Working Groups (IDWGs) such as those on Desertification and Mountains. The thematic areas presently defined are:

- Alternative crops;
- Urban and peri-urban agriculture;
- Good Agricultural Practices and organic agriculture;
- Conservation agriculture (conservation tillage systems);
- Production and biodiversity in crop and grassland systems;
- Sustainable use of genetic resources: plant breeding and biotechnology.

29. Although these thematic areas were not necessarily defined as organizational priorities in crop production, they did serve as a frame of reference for assessing country priorities in this evaluation.

REGULAR PROGRAMME STRUCTURE

30. The present evaluation covers the period 1996-2002, when FAO's programme structure was undergoing considerable change with the introduction of the New Programme Model and the Strategic Framework. In the period 1996-97, the work being examined in this evaluation was covered largely under Sub-programmes (SP) 2122 *"Crop Management and Diversification"* and 2125 *"Development and Management of Grasslands and Forage Crops"*. Some elements were covered under SP 2121 *"Conservation and Management of Plant Genetic Resources"*, SP 2123 *"Seed and Planting Material Development"*, SP 2124 *"Crop Protection"* (particularly work related to IPM/FFS) and SP 2151 *"Contribution to Improvement of Crop and Livestock Productivity"* (the latter SP was for the Joint FAO-IAEA Division).

31. From the Programme of Work and Budget (PWB) 2000-01 onwards, sub-programmes were no longer used and activities were grouped as Technical Projects (TP), Continuing Programme Activities (CP) and Technical Support (TS). Work formerly under *"Crop Management and Diversification"* was divided among three TP, the largest being *"Development of Improved Crops and Cropping Systems"* (covering work on field crops, industrial crops and some horticulture) and the others were *"Urban and Peri-Urban Agriculture"* (horticulture) and *"Information for Plant Production and Protection Decision-Making"*. Work on grasslands and pastures retained its separate identity in the TP *"Grassland-based Production Systems"*. Thus, the change to the New Programme Model had not yet led to a fundamental re-shaping of AGP's crop production activities, with the exception of the separate identity for Urban and Peri-Urban Agriculture.

32. In the PWB 2002-03, there was considerable change in the organization of Regular Programme work, in an effort to promote greater inter-disciplinarity within FAO's crop production activities. The TP on information and decision support systems was retained, albeit with a reduced budgetary allocation. The TP on Urban and Peri-Urban Agriculture was dropped and the work and some resources folded into a new TP in the Agricultural Support Systems Programme called *"Meeting Urban Food Needs"*. Most of the AGPC work became part of a new TP on *"Strategies and Technologies for Sustainable Crop and Grassland Production Systems"*. This TP included the former Grasslands Production Systems work, plus some of the former TP on *"Development of Improved Crops and Cropping Systems"* and new work on plant breeding and biotechnology. It thus became the largest (in terms of resources) crop production TP. The other new crop production TP for 2002-03 was on *"Alternative Crops and Cultivars for New Opportunities"*, which included work related to novel varieties, lesser-known plants and assessment and promotion of high-value crops and integrated greenhouse crop production and protection.

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33. In the Medium-Term Plan 2004-09, significant changes in programme structure include ~~that~~ work on plant breeding and biotechnology ~~will be being~~ transferred to a new TP on *“Conservation and Sustainable Use of Plant Genetic Resources, including through Biotechnology and Seed Sector Development”*². This TP is the repository for work associated with the Global Plan of Action for the Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture (GPA) to provide technical underpinning to the new International Treaty on Plant Genetic Resources for Food and Agriculture (PGRFA). FAO’s work on conservation agriculture will now be included in an inter-departmental TP (*“Promotion of Conservation Agriculture”*).

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EVOLUTION OF FAO’S WORK IN CROP PRODUCTION

34. As noted in Section I above, until about 1989, FAO had a large and growing field programme in crop production, supported to a major extent by UNDP and bilateral Trust Funds, along with TCP activities. The number of crop production field projects started to decline in the early 1990s, as did the rest of FAO’s Field Programme, when UNDP and bilateral Trust Funds began to cut back their support. From 228 projects backstopped by AGPC in 1989⁵, the number declined to some 61 non-emergency projects in May 2003. Of these 61 projects, 42 (66% of the project portfolio) were funded by TCP.

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35. This development has had a profound impact on the way FAO works on crop production. Up until the mid-1990s, the main role of AGPC was support to field projects, many of which had large budgets and required considerable effort in terms of technical backstopping. During this period, work under the Regular Programme was comparatively less important. Regular Programme work was at the same time highly fragmented. The *Review of the Regular Programme 1990-91* describes 10 priority areas under *“Crop Improvement and Management”*², but Regular Programme work in each of these areas, with the exception of development of research networks, was virtually insignificant compared to the Field Programme.

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36. The decline of the Field Programme and the overall decentralization of FAO programmes led to a new emphasis, particularly at FAO Headquarters, on normative work under the Regular Programme. The challenge has been to re-shape a highly diffuse Regular Programme into a coherent, focused set of activities that are relevant to a large portion of FAO’s membership. To a large extent, FAO as a whole has been facing this challenge in the process of converting to a new Programme Model based on the Strategic Framework. However, in crop production where the nature of the work has changed considerably over the past decade, the re-shaping of the Organization’s work has made an extensive re-examination of priorities and methods of work particularly important.

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37. Some progress has been made in breaking down the disciplinary boundaries, through working more closely with other organizational units, particularly in the PAIAs and IDWGs. Also significant has been the identification of particular thematic areas to address in crop production (mentioned above). However, there is still a need to be more specific on the role that FAO intends to play, particularly in the Regular Programme, beyond for example, general promotion of alternative crops and cultivars. The challenge remains to identify more specifically and coherently what FAO’s body of work in each of these thematic areas should be and how, taken together, this work will be useful to member countries. For example, the largest Technical Project at present on crop production (212A3 *“Strategies and Technologies for Sustainable Crop and Grassland Production Systems”*) contains all AGPC work not covered by other TPs (212A1 and the TPs shared with other AGP units (212A8, 212A9) and inter-departmental entities (210A1 and 210A2 in particular). The overall objective for this TP is quite general and the proposed amount of funding in the MTP 2004-09 is extremely low to achieve in a comprehensive way the ambitious “major outputs” to be produced. Hence, there is a need for more focus and this is addressed further in Section VII below.

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⁵ *Review of the Regular Programme 1990-91*, Table 8.3, p.138

REGULAR PROGRAMME RESOURCES

38. Besides the Chief of AGPC, there are 20 Professionals dealing with crop production in AGP (i.e. excluding AGPP and AGPS). Of these, 13 posts are located at FAO HQ. They are distributed among the commodity groups as follows:

- Field food crops – 5 posts⁶
- Horticulture – 4 posts⁷
- Grassland and pasture – 2 posts
- Industrial crops – 1 post

39. There is also one post for a Professional dealing with plant biotechnology.

40. Seven crop production posts are located in the Regional and Sub-Regional Offices. There is one post each in the Regional Office for Africa (Crop and Pasture Production), Sub-Regional Office for Southern and East Africa (Plant Production and Protection), the Regional Office for Latin America and the Caribbean (Plant Production) and two in the Regional Office for Asia and the Pacific (one focusing on Horticulture and Field Crops and one specifically on Industrial Crops), and in the Regional Office for the Near East (one on Range Management and Fodder Production and one on Plant Production).

41. Funds made available for programme entities primarily related to crop production and therefore under the responsibility of the Crop and Grassland Service (AGPC) are on a downward slope since the 2000-2001 Programme of Work and Budget (PWB). Approximate funding data are presented in the following table:

Table 1: Evolution of AGP Headquarters RP budget since adoption of Strategic Framework⁸ (in US\$ 000)

	2000-2001	2002-2003	2004-2005 (proposed with Zero Real Growth)
Programme elements primarily related to crop production⁹	4,508(100)	4,334(96)	3,767(84)
All other programme elements in AGP	13,458(100)	13,906(103)	14,391 (107)
AGP HQ Total	18,056 (100)	18,240 (101)	18,158 (101)

42. The above data show that the resources devoted to crop production have undergone a decline within the overall budget of the Plant Production and Protection Division, from 25% of the total in 2000-2001 to 21% in the proposed 2004-2005 PWB. To meet the resource reduction, the post on cropping systems has been marked for abolition.

43. The reason for the reduction in crop and grassland production activities is that, as a result of requests from ~~mMembers at Governing Body meetings~~ ~~countries in the Governing Bodies~~, more resources had to be invested in work carried out by the Plant Protection Service, particularly

⁶ including one on cropping systems and one who is the secretary of the International Rice Commission (IRC)

⁷ including one who is the secretary of the Global Cassava Development Strategy

⁸ Prior years not included because data not comparable due to change in programme and budget format.

⁹ 210A1 "Sustainable Intensification of Integrated Production Systems", 210A2 "Promotion of Conservation Agriculture", 212A1 "Alternative Crops and Cultivars for New Opportunities" ("Development of Improved Crops and Cropping Systems" in 2000-01), 212A2 "Urban and Peri-Urban Agriculture" (2000-01 only), 212A3 "Strategies and Technologies for Sustainable Crop and Grassland Production Systems" ("Grassland-based Production Systems" in 2000-01), 212P5 "Support to Strategy Formulation and Promotion of Specific Action for Rice Development in Member Countries of the International Rice Commission".

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related to the International Plant Protection Convention. Similar pressure for increasing support of crop and grassland programmes was not forthcoming.

FIELD PROJECTS

44. During the review period (1996-2002), some 93 non-emergency TCP projects dealing with crop production were approved ~~that dealt with crop production~~ and were under the primary technical responsibility of AGPC. By subject area, they were distributed as shown below:

Table 2: Distribution of Crop Production TCP by subject area, 1996-2002

Subject Area	# of projects	% (rounded)
Field Food Crops	15	16
Horticultural Crops	44	47
Industrial Crops	10	11
Grasslands and Pastures	9	10
Interdisciplinary/Other	14	15

45. Besides the 93 TCP projects, there were ten Trust Fund projects approved during the review period, six of which were on horticulture. Belgium was the largest donor, having funded five of the horticulture projects, and Italy funded two projects. Other donors, with one project each, were the Netherlands, the EU and the International Development Research Centre (IDRC). Three UNDP projects on crop production were approved, and FAO implemented either Support Services for Policy and Programme Development (SPPD) or Support for Technical Services at Project Level (STS) for another eight projects.

46. As mentioned previously, this evaluation also covers some specific areas of crop production (e.g. IPM, aspects of seed production) that are not under the responsibility of AGPC. Among the field projects, an additional 36 TCPs fall into these categories, along with 10 Trust Fund projects (mostly on IPM), 5 Unilateral Trust Fund projects and SPPD or STS elements for 10 UNDP-funded projects.

47. The evaluation did not cover emergency projects in crop production, usually related to seed supply. FAO's emergency assistance work was reviewed in-depth in 2002.

48. During the course of the evaluation, review teams examined a total of 42 field-based activities¹⁰ in the 14 countries visited. They are characterized below:

Table 3: Field Activities Evaluated, by source of funding

Funding Source	# of projects	% (rounded)
FAO-TCP	33	79
GCP (bilateral Trust Funds)	4	9
UNDP	4	9
Combined	1	2

¹⁰ Multi-phased projects (6 in total) counted only once each.

Table 4: Field Activities Evaluated, by crop production discipline (all funding sources)

Crop production discipline	# of projects	% (rounded)
Field Food Crops	9	21
Horticultural Crops	15	36
Industrial Crops	5	12
Grasslands and Pastures	3	7
Interdisciplinary/Other ¹¹	10	24

49. As can be seen from the above, TCP has become by far the primary source of funding for field activities and horticulture is the most important area for project activities.

IV. Assessment of Priorities for FAO Work in Crop Production

QUESTIONNAIRE SURVEY

50. Besides the field visits to 14 countries, the evaluation included a questionnaire submitted to most FAO member countries and selected national and international organizations dealing with crop production, primarily in research. Questionnaires were also sent to donors. The purpose of the questionnaire, supplemented by information gained by field missions, was to determine the perceived expectations of member countries and partner institutions of FAO in the field of crop production and obtain their assessment of the utility of FAO's work in this area.

51. Two different questionnaires were prepared: one for developing country FAO members; the other for donors, national and international institutions. The main difference was that the former included a focus on actual assistance received from FAO and its utility to the country. Both questionnaires asked about familiarity of the respondents with FAO crop production activities, their relative importance and the quality of FAO's work in various areas related to crop production.

52. Questionnaires to developing member countries were distributed through FAO Representations, or through UNDP in those countries where there is no FAO Representative. A clear limiting factor in the questionnaires was that the respondents in each country were selected by the FAO Representative and therefore, there may not have been uniform understanding of priorities or familiarity with FAO's work. This was evident from some of the replies. Still, it was considered important to obtain views of a larger cross-section of FAO's clients and the questionnaire served that purpose.

53. The return rate of questionnaires to developing country members was considered good, with replies received from 71 countries of the 137 sent out (52%). The questionnaire also received a good response rate from international agricultural research organizations and international agencies surveyed (69% replied). Response rates were much lower from national institutes and research organizations identified separately (only 22% replied) and from major donor countries to FAO (33% replied).

54. Developing member countries were asked to assess generally which were ~~there~~ their most pressing needs for external assistance. Areas proposed in the questionnaire for selection were: policy, production technology, research, and production economics. Research and production technology received almost the same level of expression of need, followed by production economics and then policy. Only in the policy area was there a significant number of replies that

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¹¹ All the non-TCP FAO-funded activities were interdisciplinary. In addition, all non-AGPC crop production-related activities evaluated were counted here.

no external assistance was needed (31%); for the other areas, less than 10% replied that no assistance was necessary.

55. At least in the questionnaire survey, traditional areas of concern were considered to be the highest priority areas. This can be attributed to the fact that most respondents worked in Ministries of Agriculture. Increasing agriculture production under irrigation was given the most votes as a priority topic, followed by development of new crops (diversification), increasing production in dryland areas and seed production/propagation of planting materials. The least mentioned topics included some that are considered as priority areas by AGPC, including urban and peri-urban agriculture (mentioned by only one country as one of its top three problems in crop production), conservation crop production (mentioned by 3 countries), biotechnology, including GMOs (12 countries) and organic agriculture (16 countries). Since most respondents did not elaborate on their choices, it is difficult to know whether some items are relatively low priority because FAO has not made a well-developed case for pursuing these topics, or whether they are simply lower priority. During mission visits to countries, considerable interest was expressed in some of these topics, e.g. biotechnology in Latin America and the Near East, and organic agriculture in Asia and Europe. This highlights different production constraints and agricultural research and development priorities for different regions.

56. The questionnaire listed several types of outputs (e.g. project preparation, expert advice, networks, publications, websites) and asked whether FAO's work on these was better than expected, worse, or as expected. Countries generally replied that FAO's work was as expected, with small and roughly equal numbers of respondents finding the work either better or worse than expected. However, when asked to compare the work of FAO with that of other sources of external assistance, FAO was considered superior in technology development (research), assistance in networking and policy formulation, and about the same as other sources for application of production technology. Only occasionally were others considered to be better than FAO; in research, there were more such responses than any other category but even here, over twice as many respondents said FAO was better than others ~~than the reverse~~. Thus, it can be concluded that respondents were broadly satisfied with FAO's work related to crop production in all areas.

57. Responses were rather different, in terms of priorities, from national and international institutions and donors than from developing member countries. Most of the responses from the latter were from Ministries of Agriculture. Partly because many of the institutional respondents were involved in research, plant breeding was considered the most important topic for FAO involvement, followed by integrated production and pest management. However, there was much more divergence of opinion among this group of respondents and topics such as organic agriculture, conservation crop production and biotechnology did receive numerous mentions as being particularly important. Urban and peri-urban agriculture, one of FAO's thematic areas and former subject of a Regular Programme TP, was mentioned ~~only~~ by only two respondents.

58. National and international correspondents were asked to assess FAO's work in specific areas of crop production. Overall, FAO's work was ranked the highest in Integrated Plant Production and Protection; seed production/propagation of planting material; and increasing production under irrigation. Only a few respondents identified areas where FAO's work was not satisfactory. However, three of 19 respondents (16%) stated that FAO's work on increasing production in dryland areas was unsatisfactory. This perhaps reflects the difficulties in enhancing agriculture in marginal, drought-prone ecologies; solutions, when they exist, are often complex (e.g. conservation tillage with controlled grazing during the dry season) and thus are often not easily addressed effectively with short-term TCP assistance.

59. National and international respondents identified work in some of FAO's new thematic areas as satisfactory, but in need of improvement. These areas included organic agriculture, biotechnology and urban/peri-urban agriculture. However, these thematic areas were also among those where (along with plant breeding) respondents indicated that they did not have much

knowledge about FAO's work. Thus, it would seem that there is a need for FAO to define its role in these areas more clearly and make its work better known.

REGIONAL PRIORITIES

60. Production constraints differ from one region to the other; consequently, there will be different demands for the services to be provided by FAO in the area of crop and grassland production. The CGIAR has recently started a new process of reflection on priorities. So far, only some preliminary results are available but these may be helpful in highlighting some of the major research and development needs for the different regions. These results were confirmed by the evaluation missions that visited each region. In all regions, poverty reduction is the overriding goal.

61. Asia may be characterised by continued concern of feeding the dense populations in many parts of the region under conditions of growing urbanization, continued loss of agricultural land, and increased competition for water. This was confirmed by the present evaluation mission when it visited Asian countries. In relation to crop and grassland production, germplasm improvement and the development of sustainable production systems are considered the most important. For germplasm improvement, the main efforts should be focused on enhancing germplasm through conventional approaches, while second priority is allotted to biotechnology. Stress resistance and nutritional content of food staples need to be improved, and high value crops, including those with export potential, should be developed to increase farm income. In the area of sustainable production systems, the highest attention should be given to integrated crop and livestock systems and systems like conservation tillage, especially for drought-prone areas.

62. In Central and West Asia and North Africa, the overriding concern ~~are~~is the severe shortages of water. Thus, water use efficiency must be improved under both rainfed and irrigated conditions, through agricultural intensification and diversification. Crop improvement efforts need to continue to produce drought-resistant plants with the necessary resistance to biotic and abiotic stresses. The highest priority for the region is the utilization of genetic resources, genomic techniques and plant breeding to improve water use efficiency in crops. Intensification of mixed crop/livestock systems is also rated highly.

63. Low agricultural yields linked to low soil fertility and low labour productivity remains the dominant agriculture production concern for sub-Saharan Africa. These problems require continued efforts in the areas of germplasm improvement related to matters such as increased quantity and quality of food crops, improved resistance to biotic and abiotic stresses and enhanced nutrient use efficiency. In addition, the development of sustainable production systems and integrated natural resource management, including crop/livestock integration especially in the savanna regions, needs to be actively pursued. Income-generating activities are becoming of increased importance in agricultural development activities.

64. In Latin America and the Caribbean, constraints on productivity are of less concern than in other regions; industrial crops are of high importance. Emphasis in agricultural research and development activities is shifting to matters such as product quality, production diversification, new tropical pests and diseases, climate change and development of biotechnology. To address these concerns, holistic approaches are required. With respect to crop and grassland production, the highest priority is given to biotechnology to fight poverty, and affordable to everyone, followed by development of under-used Latin America~~n~~ genetic resources, and traditional breeding of food crops.

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V. Assessment of Results – Regular Programme

65. FAO's Regular Programme activities in crop production are largely aimed at information generation and dissemination, provision of a forum for discussion among member countries and providing expert advice to member governments. Outputs produced during the review period include networks established and/or supported, publications, databases and trained staff.

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NETWORKS

66. The development and promotion of crop networks have been a primary means of action through the Regular Programme for many years. FAO-sponsored networks are found in most crop production disciplines, especially horticulture (including African Network for Horticulture Development, Global Network on Mushrooms, International Cactus Pear Network, Inter-American Citrus Network, Latin American Tropical Fruits Network, Date Palm Global Network). Sub-regional networks and working groups are sponsored on grasslands and pasture crops, in Campos, the Chaco, and Patagonia in Latin America, East Africa, Southeast Asia and temperate Asia. The International Rice Commission supports four networks, on hybrid rice, on advanced rice breeding in Latin America and the Caribbean, on rice in Mediterranean climates and on rice production in wetlands/inland valley swamps. FAO also sponsors a maize network for tropical Asia (TAMNET) and a biotechnology network for Latin America and the Caribbean (RedBio). While networks operate in all regions of the world, they are particularly significant for Latin America and the Caribbean.

67. Networks created by FAO have established working platforms, through which network members can contact each other (either through correspondence or attendance at network meetings), exchange information and research results and potentially create opportunities for in-depth research collaboration. In this sense, the networks have been valuable and cost-effective.

68. However, FAO has not been particularly successful in attracting funding from network members or other sources so that networks can become self-sustaining and build up their activities. Reluctance to contribute to network maintenance is, in most cases, due to budgetary restrictions and difficulties in obtaining approval for expenditures of this type – a situation that is not likely to change on its own. One promising exception is RedBio, for which an international Foundation has been established, along with national foundations in a few countries.

69. FAO continues to make small financial contributions to support many of its networks, in addition to a substantial amount of Regular Programme staff time. As a result, communications schemes (newsletters, webpages) are maintained and, in some cases, periodic network meetings are held. Some networks are maintained by individuals or member country institutions that often make vital contributions to network maintenance (e.g. Cuba for the Latin American networks on both citrus and tropical fruits).

70. Since none of the crop production networks are self-supporting and due to the large number of networks of varying significance, it would be opportune for FAO to review the networks it supports. Support should be withdrawn from those networks deemed to be of lowest priority and with little chance of long-term survival without constant FAO input. Responsibility for networks in general should be transferred increasingly to members. Greater efforts should be made to secure additional support, including from the private sector, for those networks where this should be possible. For example, the citrus industry in the Americas is of major importance and there should be much greater opportunity for increased financial participation by beneficiary parties. Should FAO continue to support or create networks, it should be on the basis of their likely long-term sustainability, with FAO support limited in time.

71. Thus far, none of the networks promoted by FAO has been task-oriented, i.e. designed to be phased out once solutions to specified problems are found. There is considerable justification

for FAO to support and coordinate such networks, where FAO's contributions can potentially leverage other resources for particular tasks.

PUBLICATIONS

72. FAO publications are produced under both the Regular and Field Programmes. Publications typically include meeting and expert consultation reports and papers, technical bulletins and guidelines (including FAO Plant Production and Protection Papers) and newsletters, often produced by technical cooperation networks.

73. During the review period, FAO produced a large number of publications related to crop production. Because no FAO reporting system can capture all the publications, it is not possible to know the exact number, but the Programme Implementation Report 1998-99 states that 31 methodologies and guidelines were produced by the Crops Programme as a whole (including plant protection) in that biennium alone, along with nine publications and involvement in 16 meetings, all of which ~~likely would have~~presumably had published reports.

74. During the country visits, evaluation missions attempted to assess the familiarity of key respondents with various aspects of FAO's crop production work, including its publications. Missions found very little familiarity with FAO's publications, either in Ministries of Agriculture or in national research institutions. In many cases, respondents could not cite any recent FAO crop production publication that they had seen (except for newsletters in some cases).

75. This finding, even if based on anecdotal evidence, is cause for concern, given that publishing is an important activity for FAO and development and production of publications are costly in many cases. If publications are not reaching intended audiences, it means that FAO policy in this area needs review.

76. Subsequent discussions have led the evaluation team to cite several possible causes for ~~the~~this lack of familiarity ~~in member countries~~ with FAO publications. One main factor is the distribution system, which does not target specific audiences for certain publications. This issue was addressed in Chapter Five of the Programme Evaluation Report 1996-97. However, many crop production publications are not covered by standard distribution arrangements and it appears that even ~~these are not well targeted in their distribution~~those which are distributed are not well targeted.

77. Another general problem with certain publications is the lack of clarity about the target audience. This was found to be the case particularly for a large number of publications produced by the Regional Office for Asia and the Pacific on practices for growing particular crops in the region. In addition, it is not certain that the intended target audience is receiving the publications. While many contain useful information, it is sometimes not in a form that is easily useable by particular potential target groups (e.g. producers, extension agents).

78. The evidence suggests that, in a period of severe resource constraints, there needs to be greater selectivity in deciding whether to publish various documents and far more attention ~~should~~ ~~be~~ given to ensuring their distribution to an intended set of beneficiaries. The act of identifying intended recipients should be an integral part of a decision whether or not to publish, and in what form.

DATABASES

79. Not surprisingly, database development has become increasingly more important throughout the reporting period as a means of information distribution. Perhaps the most significant initiative has been EcoPort, developed in a consortium with the University of Florida and the National Museum of Natural History of the Smithsonian Institute (USA). The University of Florida acts as Secretariat for this three-member consortium and provides and maintains the telecommunications and computer support services that constitute the EcoPort database engine

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and website. This tool includes detailed information on 756 crop plants, including 147 listed by IPGRI/GFAR/FAO as key underutilized, high-potential species. EcoPort received over 3.5 million hits in 2002 and 130 items per day (from a total of over 297,000 pages) were updated. While EcoPort has been recognized as a valuable tool for making information available freely, its full potential has not yet been realized as the information on many crops could be more complete, provided interested parties come forward to develop the information base.

80. Another important product is EcoCrop. Originally developed by the Land and Water Development Division (AGL), this crop environmental requirements database is available on CD-ROM and an Internet version was developed by AGPC. AGPC now manages the EcoCrop database, which is used to match crop species (over 2000) with specific environments, detailing uses and agronomic characteristics. The Internet version of Ecocrop contains over 115,000 pages and received over 938,000 hits in 2002.

81. HORTIVAR, another important database, details performance specifically of fruit and vegetable cultivars in relation to different agro-ecological zones, and is also available both on CD-ROM and the Internet. Both EcoCrop and HORTIVAR are potentially very useful tools but require more publicity to make them better known and to develop them further with additional information.

82. Other important databases are the Grassland Index with 530 grass and forage legume species with a picture gallery of over 600 images and Country Pasture Resource Profile database presently covering some 70 countries; and the rice databases CORIFA and RICEINFO-FAO.

83. While not a database in a strict sense, the website operated by AGPC is intended to give information on the Service's activities, and provide access and links to further information. However, at the time of the review, its appearance was uneven: some webpages were useful and up-to-date (such as those on rice and grasslands), while others provided only limited – and often outdated – information. The modernization of the website is scheduled to be launched by June 2003.

SECRETARIAT FUNCTIONS

84. AGPC provides the secretariat for the International Rice Commission (IRC), founded in 1949. The IRC was particularly important in promoting transfer of new rice technology during the Green Revolution. Its mandate is to promote rice production and its task is to analyse issues relating to rice yield, development and improvement and provide a forum for discussion of these issues.

85. The IRC has produced numerous technical outputs throughout the review period, including technical books and manuals, videos, newsletters, has taken part in several studies related to rice production and supported the four networks mentioned in Section V. Of these, the most important is the International Task Force for Hybrid Rice, aimed at free exchange of germplasm, information and data concerning hybrid rice research and development programmes and strengthening of collaborative research. The work of AGPC and the IRC has been significant in increasing national interest in hybrid rice, including in some countries visited by evaluation field missions (e.g. India, Vietnam). FAO's work in this area is generally well known and appreciated by member countries interested in the topic.

86. AGPC also hosts the secretariat of the Global Cassava Development Strategy (GCDS), an internationally coordinated effort to promote cassava research and outreach. The development of the strategy was spearheaded by IFAD and FAO, in collaboration with the International Institute of Tropical Agriculture (IITA), the International Centre for Tropical Agriculture (CIAT), the Natural Resources Institute (NRI) and the "Centre de coopération internationale en recherche agronomique pour le développement" (CIRAD). The Strategy was endorsed at a forum in April 2000, hosted by FAO and IFAD and attended by a broad base of representatives from developed and developing countries. The implementation plan provides the framework for cassava

development activities, including coordination, information management and promotion, integrated projects to promote and improve cassava and global action plans on cassava production improvement, and on processing, utilization and marketing. FAO's role is to act as the focal point for administration and dissemination of information, including maintenance, updating and improving the GCDS website. Progress on implementation of GCDS has been slow due to lack of immediately identifiable resources. However, subsequent to a meeting in 2002 on cassava agronomy and breeding, projects are being prepared for funding and eventual implementation; IFAD has agreed to finance a similar meeting on cassava marketing this year, which should also lead to various projects being prepared.

JOINT FAO/IAEA DIVISION (AGE): SUSTAINABLE INTENSIFICATION OF CROP PRODUCTION SYSTEMS THROUGH TECHNOLOGIES AND CAPACITY BUILDING

87. The Joint FAO/IAEA Division was established in 1964. Its work related to crop production is organized in the IAEA Sub-programme on Plant Breeding and Genetics, jointly implemented by the Plant Breeding and Genetics (PBG) Section and the Plant Breeding Unit (PBU) at the Seibersdorf Laboratory, which is intended to assist national plant breeding programmes to use mutation techniques and modern biotechnologies for developing better varieties of major and under-exploited food and industrial crops. The goal is to improve agronomically important characters for major crops with emphasis on marginal and stress-prone areas and on speeding up breeding of new crop varieties by increasing the efficiency of mutation induction and effectiveness of mutant selection using molecular markers. Emphasis has shifted in recent years from developing better crop varieties and cultivars to more upstream research to identify, select and characterize genes, and protect intellectual property rights through molecular fingerprinting and other biological methods.

88. The Joint Division gives support and guidance to National Agricultural Research Systems (NARS) through international and regional Research Networks, and through Coordinated Research Projects, Technical Cooperation Projects and Training Courses which focus on capacity building and adoption of new technologies¹². Research, training¹³ and other support services are provided by the Plant Breeding Unit at the FAO/IAEA Agriculture and Biotechnology Laboratory, Seibersdorf (Austria). The Laboratory also provides free service for irradiation of seeds and vegetative material as well as for flow cytometry and work on DNA fingerprinting using molecular markers. In addition, the Laboratory maintains a mutant germplasm repository (MGR), which pays special attention to local and scientifically neglected or understudied crops. The repository helps to undertake work on DNA fingerprinting which is useful for Mutant Germplasm Registration. Information exchange is facilitated by organizing symposia, seminars and workshops, commissioning thematic papers, and disseminating the results of these and other activities through publications and newsletters. The Joint Division has built up a mutant genetic resources database¹⁴, and is also a co-founder of *Plant Breeding News*, an FAO-promoted electronic newsletter issued monthly to over 1700 plant breeders.

89. The PBG sub-programme of the Joint Division has an annual budget of approximately US\$ 2.5 million, of which FAO provides currently roughly 30%. When IAEA resources for

¹² Current international collaborators (under Coordinated Research Projects) are: IITA – molecular markers; IRRI – salinity tolerance; ICGEB – genomics; IPGRI – neglected crops; INIBAP – banana; CIAT – induced mutations. ICRISAT collaborates under a TC project. IITA-ICRISAT as well as IRRI also collaborated in the organization of training courses, and experts from CGIAR have undertaken consultancy work for the Sub-programme (ICRISAT, IITA, ICGEB, ICARDA and CIAT).

¹³ Apart from individual training at Seibersdorf of 3-6 months, group training is also given at interregional and regional levels, and scientific and study visits of 2-4 weeks to visit different countries organized. Between 1977-1997, 300 scientists from developing countries were trained at Seibersdorf under RP activities, while 140 trainees were trained during the same period by Regional Training courses. In addition, 250 trainees were trained under Regional Projects.

¹⁴ As of 2003, the FAO/IAEA Mutant Variety Database has descriptions of 2259 varieties of 168 species.

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coordinated research were reduced in 2003 due to the higher priority given to the human health programme, this was offset to some extent by increased resources from FAO, reflecting higher priority given by FAO to enhancing plant biodiversity. In 2003, seven full-time scientists worked for PBG, of which two were provided by FAO and five by the Agency.

90. PBG's regular activities related to crop production are implemented through two main projects: (i) Induced biodiversity for breeding crops with increased adaptability to drought, salinity and other constraints; and (ii) Identification, characterization and transfer of mutated genes. While the latter aims at the development of genetic maps and molecularly characterized genes, the former focuses on protocols for mutation induction and selection of mutants and mutated germplasm with agronomically important characters.

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91. Field work is carried out through two types of projects, both funded by IAEA: Coordinated Research Projects (CRPs), which are more research oriented and receive US\$ 8,000-10,000 per year per participating institute for a duration of up to 5 years, and Technical Cooperation Projects (TCPs). In 2003, 31 national TCPs ~~Technical Projects (TCPs)~~ were operational in 24 countries, and 8 regional TCPs were active in Asia, Latin America, and Africa and Maghreb, with a total combined budget of US\$ 12 million. Five CRPs were supported: (i) Underutilized and Neglected Crops (1998-2003), (ii) Mutational Analysis of Root Characters of Annual Food Plants Related to Plant Performance (1999-2004), (iii) Functional Genomics (Molecular Characterization of Mutated Genes Controlling Important Traits for Seed Crop Improvement (1999-2004), (iv) Tropical and Sub-Tropical Fruit Trees (2000-2004), and (v) Physical Mapping of Mutated Genes for Crop Quality (2002-2007).

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92. Examples of the work include the project Mutational Enhancement for Genetic Diversity in Rice (RAS/5/037), which, among others, has established Regional Rice Mutants Multilocation Trials and expects that 5-7 new, high yielding rice varieties will be released during the next 3-5 years. The spread of Bayoud disease in date palm has become a trans-national problem in North Africa which requires an area-wide approach. Two projects concerning the Control of Bayoud disease in Date Palm (RAF/5/035 and RAF/5/49) have succeeded in achieving the characterization and isolation of the fungal toxin and the development of short- and long-term strategies to control the spread of the fungus and to breed disease-resistant varieties using radiation-induced mutants. Work on in-vitro mutagenesis in banana originated in the 1980s and has produced a considerable body of knowledge on the use of mutation techniques and related biotechnologies. PBG has supported the work through 25 TC projects and 2 CRPs on banana, and has established an interregional network on the use of mutations for banana improvement (FAO reduced its involvement in this area due to scarce resources). Several improved mutants (such as eight high yielding sorghum varieties in Mali or a cassava variety with improved cooking quality in Ghana) have been officially released as new varieties under two large-scale regional AFRA (African Co-operative Agreement for Research, Development, and Training Related to Nuclear Science and Technology) projects on increasing production of nutritious food through mutation induction and biotechnology (RAF/5/042 and RAF/5/050).

93. As an overall assessment, PBG is strong in induced mutation, applied molecular techniques including molecular markers and their use in mutant germplasm characterization, and development of double haploids. It is serving a very useful purpose in assisting developing countries to develop new varieties through induced mutation techniques and in providing training and services to its collaborators in the member countries. This is evident from many varieties, which have been developed in different crops due to induced mutation. Good collaboration has also been developed with the relevant CG Centres.

94. Partly due to the physical distance, PBG's relationships with units at FAO headquarters have not been very close in the past. This was borne out by an External Review of the Joint Division in 1997, which concluded that there was still substantial scope for enhancing existing linkages, including those with the Crop Production and Protection Division of FAO and with various International Agricultural Research Centres (IARCs). The Review recommended, among

others, that FAO should be more fully involved in (research and project) proposal formulation, and that FAO and the Joint Division should explore ways to more effectively support member country needs. A recent visit by members of the present Evaluation Team found that at the strategic level, coordination had improved (e.g. a PAIA on Biotechnology has been created, handled by an Inter-Departmental Working Group and chaired by the AGE Director¹⁵; there have been reciprocal invitations to meetings, and participation by the Section Head in sessions of the International Rice Commission), but greater collaboration was still required especially in identifying priorities, and in joint follow-up and use of the results of CRPs and TCPs.

VI. Assessment of Results – Field Programme (Including TCP)

95. The assessment of FAO's field activities is based largely on the missions by independent external consultants and FAO Evaluation Service staff to 14 selected member countries, where they reviewed a total of 42 different interventions (see Section III above). In addition, countries completing the evaluation questionnaire (see Section IV) were asked to assess field project assistance received from FAO, if there had been any.

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QUALITATIVE ASSESSMENT

96. Missions to the 14 selected countries scored each project on eight different aspects. Scoring was done on a 3-point scale, with 3 being the highest for each item. A score of 2 was deemed satisfactory; average scores above 2 can be considered better than satisfactory and average scores below 2 are less than satisfactory. The items scored were:

- **Relevance** – did the project correspond to important country needs? For TCP projects, did it genuinely meet the criteria for approval? (**Overall average score for all projects – 2.6**)
- **Clarity of objectives** – were the desired end results clearly specified? (**Overall average – 2.5**)
- **Project formulation and design** – how well were target beneficiaries, outputs and inputs specified? Were there clear linkages between project inputs, activities, outputs and objectives? (**Overall average – 2.1**)
- **Input delivery** – how well and timely were input deliveries by FAO and other parties to the project? (**Overall average – 2.3**)
- **Outputs** – what were the quality and quantity of outputs produced, compared to expectations? (**Overall average – 2.5**)
- **Process** – was the project implemented in the correct way to produce the desired results, in terms of outputs and objectives? (**Overall average – 2.3**)
- **Cost-effectiveness** – was the project implemented in the least cost way to achieve the desired results? (**Overall average – 2.3**)
- **Sustainable effects and impact** (including follow-up) – was there effective, lasting post-project action that corresponded to what was envisaged when the project was approved? (**Overall average – 2.1**).

97. Overall, the results indicate that projects addressed important development problems and that their objectives were, for the most part, clear. The higher score for outputs as compared to input delivery is largely attributable to the delays suffered in a number of the projects, which in some cases meant that their effective implementation period may have been one season shorter than planned originally.

98. The lowest rated items overall were project design and sustainable effects and impact. For crop production projects, the two-year statutory time limit for TCP projects (which accounted for 33 of the 42 interventions) was a serious limiting factor and thus led to a stated expectation for

¹⁵ AGE has funded much of the PAIA work because sufficient resources were not available elsewhere in the Organization.

results that were in some cases unrealistic. The lower score on sustainable effects and impact was often attributable to the fact that follow-up in some cases was not sufficiently considered before the project was undertaken; rather there were hopes that the eventual success of the activity would influence donors or host Governments to take appropriate follow-up action. In other thematic evaluations undertaken in recent years, project design and follow-up have consistently scored lower among the various project components.

99. The country questionnaires, which covered a number of topics, asked for general information about satisfaction with project interventions ~~with~~ **and provided** the possibility to supplement the general answers with more detailed information if desired.

100. The questionnaires evidenced a continued high demand for FAO assistance in crop production. Twenty-nine of the responding countries (out of 71 total) indicated that they had received non-emergency TCP assistance and forty countries that they had received emergency TCP assistance in crop production. Countries were also asked whether they had made requests for assistance that they had not received. Twenty-one countries indicated that they had requested non-emergency TCP assistance related to crop production that was not approved, while five had requested emergency assistance that was not granted.

101. The 29 countries that received non-emergency crop production assistance classified it as good to excellent in 19 cases (66%), satisfactory in 9 cases (31%) and unsatisfactory in only one case (3%). None of the countries that replied gave additional comments elaborating on their rankings for this particular question in the survey. The countries that replied were not necessarily the same ones visited by the evaluation missions, so the projects being ranked were not the same. However, the overall scores given by countries themselves to the projects were somewhat higher than those given by the independent evaluation missions.

ISSUES RELATED TO FIELD ACTIVITIES

102. Overall, the crop production field projects reviewed by missions were found to be useful to member countries and some particularly good projects are highlighted in Section VII below. The in-depth review of field activities by evaluation missions did identify a number of issues that should be considered in the development of future crop production project activities. These include:

Coherence of FAO Projects in a Country

103. Evidence particularly from Africa suggests that the package of FAO field assistance has the highest profile and is most effective when unified behind a major thrust, (e.g. around Farmers' Field Schools (FFS) in Kenya, or around the Special Programme for Food Security (SPFS) in Burkina Faso). Good integration of emergency and non-emergency activities in support of improved crop production was evident in D.R. Congo and in Ethiopia.

Synergies and Institutional Collaboration

104. Good examples of integrating crop production with other activities included TCP/CPR/0066 on sweet sorghum in China (close coordination between the regional agro-industries officer (AGS) and AGP) and the field testing of a global initiative known as the Integrated Production Systems Priority Area for Interdisciplinary Action (PRODS PAIA) in Burkina Faso.

105. On the other hand, some TCP projects (e.g. TCP/BRA/6611, TCP/CPR/8924) had too little coordination with ~~the~~ bigger national institutions ~~that they should have been~~ **were** expected to influence and thus their catalytic effect was limited. This underscores the necessity for considering linkages to be developed much more carefully at the design stage, as this is a critical factor in post-project sustainability.

Limitations of TCP Format

106. The TCP was originally developed at a time when FAO had a strong and increasing Field Programme, which the TCP often served to complement, through timely interventions that could not have been otherwise implemented. However, with the decline of donor-funded field projects in recent years, the role played by TCP has changed. In many areas, including crop production, TCP has become the most viable alternative to test normative concepts in a field setting. This has led to several consequences, noted below:

i. Duration

107. Work in crop production is often not amenable to the two-year limit on TCP projects. Five of 33 TCP initiatives already have had a second phase and it is likely that requests will be made to extend others. While some specific topics related to crop production may be amenable to TCP (e.g. specific types of training), other activities relating to promotion of specific crops may not because of the longer amount of time for results to appear. Consequently, in the absence of donor funding that could support more long-term initiatives, some TCP projects tended to overestimate their potential impact without a realistic appraisal of the requirements in terms of time and resources.

108. In addition, in some cases, delays in project approval or implementation (usually recruitment of staff) have led to projects starting later than originally foreseen. In some cases, this has led to projects effectively being implemented for one season shorter than it was designed, or a need (due to the statutory limit on TCP projects) to design and approve a follow-on project.

ii. Definition of Target Groups-Promotion of Technologies

109. Most projects had as their stated target beneficiaries poor farmers, especially women. In general, there is an awareness of the gender dimension in crop production projects and even where there was room for improvement, projects had a significant participation of women. However, for some projects (e.g. TCP/IND/6713, TCP/EGY/0166), the beneficiaries were wealthier as only they could afford the required investments in technologies (greenhouses for protected cultivation) being promoted.

110. Such projects were successful in promoting technologies that benefited entrepreneurs and led to increased production, income and employment. However, poorer people could only be indirect beneficiaries, through opportunities for wage labour. As a result, in order to improve chances for project approval, these projects were presented ~~with the poor said to be direct beneficiaries as if directly benefiting the poor~~. If FAO policy is that TCP projects should directly benefit the most disadvantaged groups, such projects should not be approved. If the project approval policy can accept assistance to entrepreneurs who will spearhead production improvements, it should not be necessary to exaggerate who ~~is~~ the target group to enhance approval prospects. This issue should be resolved.

iii. Uniformity of Project Design

111. Most TCP projects were remarkably uniform in their inputs. These invariably included some international and national consultants (the former more under Partnership Programmes in recent years); in-country training and a study tour abroad; and some equipment. Missions felt that there should be greater discrimination in the selection of project inputs, with each one selected on its individual merits and appropriateness to the problem being addressed. For example, in many cases, national consultants were recruited in the same subject area as the international consultants, creating an impression of duplication of efforts. National authorities, when they gave an opinion, often felt that rationalization of the consultancy component was the best way to increase overall project efficiency.

Field Code Changed

112. As a result of the above, a management review of the use of TCP under the present circumstances should be considered, for crop production and ~~likely~~ other ~~likely~~ programme areas as well.

Economic and Marketing Considerations

113. The existence of a potential demand for the crop being produced is essential for any crop production project to succeed. As noted above, project proposals contained little data on the affordability of the improved planting material or the upgraded production technology among the target group, which might have given valuable signals, e.g. on the feasibility of the project, or the need to further simplify and reduce costs of technologies being promoted. In at least one case (TCP/SYR/8926), an economics and marketing consultancy was foreseen but dropped. In many cases, economic and marketing aspects were not included in the appraisal and implementation processes of crop production projects.

Farmers' Field Schools

114. Farmers' Field Schools (FFS) have become popular and have proven to be a highly effective extension method; in some countries, the name of FAO is foremost connected with the FFS approach. However, some crop production/protection projects using the FFS methodology have received inadequate backstopping and there has been insufficient interaction with the Global Integrated Pest Management (IPM) Facility, which is the recognized leader within FAO on the FFS methodology. This was particularly evident in some projects that promoted FFS, where unilateral decisions were taken to modify the methodology on the grounds that the necessary experience was already available, or inspired by a desire to speed up the process (e.g. TCP/BRA/8924, TCP/CPR/0169). The performance of these "modified" FFS ~~have~~ ~~has~~ not been analysed in-depth. These experiences also raise the issue ~~about the freedom of~~ ~~as to whether~~ implementing officials ~~are free~~ to modify project strategies and methodologies and the involvement of programme management in such decisions.

Evaluation of training effectiveness

115. With the notable exception of TCP/THA/0167, most of the projects made no serious effort to assess the effectiveness of farmer training and feed back the results to future training activities. This should be a particularly important issue for TCPs, given on the one hand their restricted budgets and time frames, and on the other the fact that training is found in almost every project. Missions felt that this was an issue that deserved greater attention, for example in projects that consciously used a modified FFS approach.

Operational Constraints

116. Other constraints identified to improved programme implementation related to funding, coordination and general rules and regulations. These included lack of funds for programme development, shifts in regional programmes by the regional Assistant Director-General without consultation with the technical division, and occasional lack of consultation with Regional Office on programme initiatives undertaken by headquarters. Areas of particular concern to TCP projects were low limits applied across the board (even on highly technical subjects) for international consultants and high charge-out rates for backstopping from FAO staff.

Joint FAO/IAEA Division Projects in Crop Production

117. The projects reviewed by the evaluation missions (in Cuba, Egypt, Peru and Thailand) were highly relevant to the specific agroecological and climatic conditions of the given country. However, the final outcome and the speed with which resulting new varieties could be available for broad use by farmers were often compromised by lack of local resources to effectively conduct the field trials of the new materials, and a lack of cooperation between national atomic energy agencies (the IAEA's main counterpart~~s~~) and agricultural research systems. FAO

Representations seem to have been only cursorily involved in projects supported by the Joint Division.

VII. Conclusions and Recommendations

STRATEGIC ORIENTATION OF FAO CROP PRODUCTION ACTIVITIES

118. Crop production activities require the inputs of various disciplines to obtain lasting results. Within FAO, AGPC is the main institutional focal point for crop improvement work, and to exercise this role, it maintains links with other units, in particular with other Services in AGP, and to a lesser extent with other FAO Divisions, including the Joint FAO/IAEA Division. In recent years, a number of developments have had a significant effect on the activities to be carried out by AGP. Those of special importance to this review include:

- since 2000, FAO is implementing its programme of work within the context of the Strategic Framework and new programme model, which provide a stronger basis for collaborative work between units;
- the adoption of the International Treaty on Plant Genetic Resources for Food and Agriculture and its Global Plan of Action, as well as matters related to the Convention on Biodiversity have led to significant changes of the activities undertaken by the Seed and Plant Genetic Resources Service and have had implications also for the work of AGPC;
- increased demand for standard setting and further development of the information system of the International Plant Protection Convention and matters related to effective pesticide management have similarly strongly influenced the work of the Plant Protection Service.

119. However, on the whole the above mentioned developments have so far had only a rather limited effect on crop production related activities undertaken by the Crop and Grassland Service. In the following, this situation is further analysed; it is concluded that the Service needs to change and develop a number of new initiatives.

120. Over the years, AGPC has continued to be organized on a commodity basis, i.e. in a mono-disciplinary manner. For example, a comparison between the 2002/03 and the 1978/79 PWB shows that almost all the current posts were already there 25 years ago, although now there are three professional posts less. But, over the last 25 years, there have been significant changes in agricultural development needs and in agricultural research and development approaches. Currently, production systems need to be analysed and understood, and problems have to be addressed in much more multi-disciplinary manner, in order to arrive at sustainable solutions. In many cases, effective Government strategies and policies are lacking. FAO should be a lead organization for the promotion of the necessary improvements on this matter by providing policy advice on opportunities and constraints, underpinned with solid technical information.

121. Thus, AGPC needs to change, to allow FAO to continue to be a valuable service provider and partner on crop and grassland production matters. In general, it is **recommended** that a much more active role should be played by AGPC on policy and strategic development matters, in addition to the more traditional technical advisory activities. To effectively carry out the technical activities, a much stronger bridge needs to be built up between institutes with the required specialized knowledge and Governments, NGOs, farmers and private sector at the field level. This is an appropriate role for FAO, because of the rapidly evolving need for specialized advice on a much wider range of production problems. Such collaborative arrangements will allow FAO to be a more effective broker and facilitator in addressing the increasing demand of member countries, for example with respect to alternative crops and cultivars. FAO has the responsibility to make sure that the technical advice provided on these new initiatives has rather wide applicability and will produce lasting results. Modern information technology systems along the lines of EcoPort and Ecocrop could become effective tools in this.

122. The evaluation accordingly **recommends** a re-organization of FAO's crop production activities, with some aspects of it to be presented in the Medium-Term Plan for 2006-2011 and

reflected in the Programme of Work and Budget for 2006-07. Specifically, it **recommends** the inclusion or modification of Regular Programme Technical Projects as detailed in the paragraphs below.

123. With the rapidly expanding impact of globalization and related socio-economic changes, there will be an increased demand for independent and reliable advice on a variety of policy matters. A considerable amount of confusion still exists on biotechnology and related subjects. FAO should help its member countries in the development of their national strategies and related policies and procedures, including bridging the gap between conventional breeders and biotechnologists to enhance the efficiency of crop improvement programmes. In this connection, the evaluation noted that within the Organization, biotechnological capacity is scattered over various institutional units. It is **recommended** that crop biotechnology expertise (including biosafety) be brought together under the Plant Production and Protection Division due to its primary responsibility for agricultural development matters that have the strongest need for the introduction and safe use of biotechnology. In such a scenario, it would be appropriate for AGE to continue to provide support to research and technical training/capacity-building.

124. The challenge for the future will be to meet increased demands for agricultural products through employing improved agricultural production methods that will lead to increased labour and land productivity and are sustainable in the long term, with minimal negative consequences for the environment. The tremendous gains made in the past in the developed world in agricultural productivity have come about through the application of science to agriculture, and the application of genetics to plant breeding in particular. The net result has been production of more food at lower prices. Also in the developing countries, there is ample opportunity to enhance agricultural production, applying results of research through plant breeding.

125. Plant breeding is a long-term venture and its successes build up slowly and cumulatively; it cannot operate successfully on a stop-go basis. ~~However, t~~The current trend in public sector investment in agricultural research, particularly in plant breeding, is that it is rapidly losing ground to private investment. ~~But~~However, there are many issues that will only be tackled by the public sector, including long-term research on important regional crops such as traditional roots and tubers, neglected species, detailed traits and a whole host of other themes that the private sector will not invest in. Moreover, the public sector is able to make its efforts in research and plant breeding available to all, which ultimately is of greater benefit to resource-poor farmers.

126. FAO has a responsibility to take the necessary action on the development and maintenance of sufficient plant breeding capacity to ensure the sustainable use of plant genetic resources for food and agriculture, which is a key element of the recently adopted International Treaty on Plant Genetic Resources for Food and Agriculture. At present, a survey of national plant breeding capacity is on-going and it is **recommended** that this be followed up with an activity in the near future, with its own specific identity within the Programme of Work and Budget from 2006-07 ~~on its own~~, or as part of the TP dealing with the GPA and PGRFA. It should analyse and raise the necessary strategic awareness of the problems to be addressed, and promote an enabling environment for the development and implementation of appropriate policy and technical initiatives.

127. To take appropriate action on the above and other relevant matters, it is **recommended** that, in the medium term, AGPC should be reorganized on the basis of project/programme teams responsible for major tropical production systems/agro-ecologies. The Organization is already gaining some experience with team approaches through its Priority Areas for Inter-Disciplinary Action, particularly that related to Integrated Production Systems (PRODS PAIA). These teams should be able to review and address the emerging agricultural production needs of the Members ~~Countries~~ in a holistic manner. They should be able to draw upon relevant expertise in FAO within and outside the Agriculture ~~real~~ Department. The establishment of such teams will require the development of short, well formulated, vision and strategy statements that give full consideration to the agricultural production constraints and priorities of the developing countries. Careful

Field Code Changed

planning will be needed on how to make the best use of the available manpower and other resources. Considering the high priority given by a wide range of member countries, it is **recommended** to develop a crop/livestock production systems Technical Project (with sufficient resources) in a particular selected agro-ecological setting as a useful pilot case to learn how to best move in this new direction. The project should be formulated and implementation begun within the present programming framework, but the Technical Project should have its own identity in the PWB 2006-07 and MTP 2006-11. The TP could be under the umbrella of the PRODS PAIA, with technical leadership from AGPC.

128. Assisting entrepreneurial farmers for the production of horticultural and alternative crops will have overall positive effects on the national economies and as such benefit also the poorer population groups. It is thus **recommended** that the Technical Project dealing with alternative crops should also include all aspects of horticulture, in order to give a more specific focus to that priority area. For these activities, a comprehensive approach should be pursued ensuring that critical elements in the production and commercialization (e.g. marketing, post-harvest value-added) chain are identified and addressed in a sustainable manner. A clear vision and specific strategies should be developed as a guide for future action, and a good understanding of the specific requirements of the different regions and countries (including for urban and peri-urban areas) will be important in this respect. In the international commercialisation chains, Good Agricultural Practices are rapidly becoming of increased importance. It is **recommended** that AGPC should continue to work closely with the relevant stakeholders to develop the necessary protocols and related practices for the effective implementation of Good Agricultural Practices.

129. Agricultural production activities will continue to be a key element in the economic development efforts of most developing countries. FAO must maintain a strong position to provide appropriate technical assistance. To do so, it will have to have a Production Service with a strong international reputation that can react in a responsible and adequate manner to new developments and needs, and can undertake the necessary initiatives. It is expected that the proposed changes will help to achieve this.

130. However, with the relatively limited resources available, a decision will have to be taken on the types of expertise that should continue to be available within FAO to carry out the above and ongoing responsibilities. To address various new demands, FAO's crop production work should be organized in such a manner that it can draw increasingly upon the knowledge of specialist services from outside FAO. Strong linkages should be developed with the international agricultural research community. Although there is some on-going collaboration, there is considerable scope for strengthening it. Accordingly, it is **recommended** that efforts be made to identify issues of importance between FAO and CGIAR institutes in particular, where joint working groups can be established and mutual benefits realized from working together, building on existing strong relationships where they exist. The importance of common interest and mutual benefits cannot be overemphasized; neither party should view this endeavour as supplementary financing.

131. Assuming continued low real growth in the FAO Regular Programme, implementation of the above recommendations may require a re-examination of current priorities and re-shaping of work programmes, including elimination of some lower priority activities. As part of this general review of priorities, it is **recommended** that a critical examination be made of FAO crop production networks, to determine which ones have potential to be more self-supporting and which ones should no longer be supported by FAO. FAO may also consider development of other networks, especially those of limited duration addressed to particular crop production issues. It is further **recommended** that FAO should reduce the number of its crop production publications to those which have practical field application, for which target audiences and an appropriate distribution policy can be identified.

FIELD ACTIVITIES

132. Although FAO's crop production field activities have significantly contracted during the 1990s, there continues to be a very substantial demand for a wide variety of inputs on matters related to plant production. The country evaluation missions undertaken for this particular review have confirmed the useful contributions made by field projects to agricultural and rural development in member countries. Examples include:

- the rehabilitation of cassava production in the Democratic Republic of Congo which should lead to lasting improvements in the food security situation in the country as a whole; it will also have some positive effects on the re-launching of the national agricultural research capacity;
- support to the development of urban and peri-urban horticulture in the Democratic Republic of Congo with the double benefit of raising farmer incomes and contributing to the improvement of nutrition in the major urban centres;
- the special programme of food production for food security in Kenya, which is building further on the successful introduction of Farmers' Field Schools in the country, and is assisting large numbers of farmer groups in a very effective manner, through participatory approaches in the identification and introduction of appropriate production practices;
- a project on pilot rubber production in Ethiopia that plays a significant role in the diversification of agriculture and contributes directly to the increase of farmer's income; these activities are now expanded through the effective collaboration with the private sector;
- support to the organization and multiplication of basic and certified seeds of rice in the west of Burkina Faso, a key element of which was the training of farmer seed producers. The project made a major contribution to the doubling of rice production in the country over the last ten years. Currently, five years after the end of the project, the benefits are still apparent through contract arrangements between these farmers and a private seed production company for the production of certified seed;
- cultivation of edible mushrooms in the Thai Binh Province in Vietnam, which has made a significant contribution to the expansion of mushroom production among resource-poor farmers; the project benefited from the effective collaboration between the various stakeholders;
- forage seed production in the Xinjiang Autonomous Region in China, which has been strengthened, and this increased capacity can now be built upon for the further development of an alfalfa seed production programme;
- the project on the development of sweet sorghum for grain, sugar, feed, fibre and value-added by-products in the arid, saline-alkaline regions of China, which has successfully demonstrated the feasibility of growing the crop under these adverse conditions. Sweet sorghum is now being used as a source for cattle feed and as raw material for industrial processing into alcohol with a large potential market;
- the project on training in hybrid rice technology in Egypt through Technical Cooperation between Developing Countries, which addressed an important national agricultural production priority. It effectively assisted in the development of early maturing rice hybrids with high yield potential under Egyptian conditions and validated their usefulness in farmers' fields, especially under saline conditions;
- effective support that has been provided to the revival of the viticulture and fruit sector in Georgia by identifying major constraints and possible solutions, developing a strategic framework for improved production, addressing the necessary regulatory issues and through the provision of improved planting materials;
- a project on the rehabilitation of tropical fruits in Cuba that has made an important contribution to the country's national strategy and related activities for the recuperation of the national fruit production sector.

133. All these examples are good demonstrations of the development and implementation of well-prepared technical assistance projects that have led, in most cases, to lasting improvements at relatively low cost.

134. The responses to questionnaires sent out in the context of this review also confirm that FAO projects addressed important development problems. Country evaluations have also concluded that FAO excelled where the country programme could unify behind major thrusts (e.g. FFS and SPFS), and – in crisis areas – where it could achieve the integration of emergency and non-emergency activities in support of improved crop production.

135. Constraints related to improved field activity performance largely concern programming, funding and coordination. Most FAO Representations lack resources to take an active part in programme development, and there was an occasional lack of consultation with the Regional Office on programme initiatives. The eventual reorganization of AGPC according to a production systems approach, together with the recommended Technical Projects for the RP, should be helpful also to guide AGPC, FAO Representations and Regional Offices in field programme development, but the ability in particular of FAO Representations to review the emerging agricultural production needs of the Member Countries remains an area of concern.

136. The two most critical issues identified by evaluation missions were project design and how to achieve sustainable effects and impact. Some design deficiencies were: overestimation of the project's potential impact (especially for TCP projects), a lack of attention to synergies and follow-up requirements, and a pro-forma designation of poor farmers and especially women as the project's target group when realistically these groups were too poor to raise the required capital necessary for participation in the project.

137. The evaluation has identified a number of issues related to the approval and implementation of TCP projects and, in view of the changed circumstances of the FAO Field Programme, it is **recommended** that a review of the conditions for use of TCP be undertaken so that the appropriate role of TCP in advancing normative work can be decided. In this context, and in view of the success of some of these highly relevant projects, it is **recommended** that project appraisal criteria be modified so as to accept project proposals that do not necessarily target the poorest or most disadvantaged strata of society but make good economic sense, so long as they reflect a clear government priority and the projects can be expected to contribute indirectly to improving the livelihoods of the poor.

138. In addition, it is **recommended** that the current format be reconsidered with a view to providing more flexibility regarding time limits. (The budgetary limits were less of a concern in the project reviewed.) The Technical Cooperation Programme Service together with the Human Resources Management Division should review its experience with TCDC consultants' recruitment as well as currently applied limits on highly specialized international consultants, with a view to identifying bottlenecks in procedures and proposing remedies.

139. In line with the recommendation for the AGPC to reorganize its work on the basis of production systems and agro-ecologies, it is **recommended** that also the project design should reflect an integrated perspective. In particular, evidence should be presented that economic and marketing aspects of the production systems promoted by crop production projects have been considered and these, if appropriate, should be included in the project itself.

140. Training is a major component of most projects, but its effectiveness is seldom assessed. In order to monitor training effects and impact and provide feedback for future training in similar projects, it is **recommended** that a basic training effectiveness monitoring scheme is applied in projects with a significant training component, either in amount or novelty of the approach. Resources should be included in projects for this when necessary. The monitoring could entail the introduction of reporting routines on training activities as well as the designation of a focal point (in the Division) that could serve as a repository of what training has been offered, the quality of the training, and good trainers and materials.

141. Farmers' Field Schools have become the extension method of choice in many crop production projects; however, some projects modified the methodology or deviated substantially from the original concept. In such cases, and in line with the previous recommendation, it is **recommended** to analyse the performance of these "modified" FFS approaches, in order to guide the national authorities and also to provide a measure of comparison with the traditional Farmers' Field School approach.

Appendix

FAO FIELD PROJECTS REVIEWED BY EVALUATION MISSIONS

Latin America and Caribbean

1. TCP/CUB/7823 “Mejoramiento de la Producción de Piña”
2. TCP/CUB/0065 “Recuperación de los Frutales Tropicales”
3. TCP/PER/6611 “Asistencia al Plan de Emergencia para el Control de la Sigatoka Negra”
4. TCP/PER/0066 “Fertilización y Propagación del Cacao para Reducir el Impacto de la Moniliasis del Cacao en el Valle del Río Apurímac-Ene (VRAE)”
5. GCP/PER/036/NET “Manejo Integrado de Plagas Agrícolas en los Principales Cultivos Alimenticios en el Perú”
6. TCP/PER/0065 “Apoyo al Control de Langostas”
7. TCP/BRA/6611 “Development of Algaroba (*Prosopis juliflora*) as a Means to Stabilize Semi-Arid Agriculture in the Northeast of Brazil”
8. TCP/BRA/8924 “Participatory Training for Brazilian Small Cotton Farmers”

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Africa

9. DRC/96/001 “Assistance to Seed Production”
10. DRC/92/001 and DRC/96/012 (Phase II) “Assistance to the National Rice Programme”
11. DRC/2000/001 “Support to Producers in the Agricultural Sector”
12. TCP/DRC/0066 “Support to the Multiplication and the Distribution of Healthy Cassava Cuttings to Bas-Congo and Kinshasa”
13. GCP/DRC/028/BEL “Support to the Development of Urban and Peri-Urban Horticulture”
14. TCP/KEN/0065 “Improving Women Farmers Livelihoods through Integrated Pest and Production Management”
15. TCP/KEN/2802 “Oil Palm Promotion”
16. TCP/KEN/2904 “Piloting Conservation Agriculture to Improve Livelihoods and Food Security for Small Holder Farmers”
17. SPFP/KEN/4501 “Special Programme of Food Production for Food Security in Kenya. The Kenya Accelerated Food Production Programme” with KEN/99/200 “Farmer Innovations and New Technology Options for Food Production, Income Generation and Combating Desertification” and TCP/KEN/2901 “Horn of Africa Initiative, Reducing Chronic Hunger in Bondo District”
18. GCP/ETH/062/NOR “Strengthening Seed Supply Systems at the Local Level”
19. TCP/ETH/0169 “Pilot Rubber Production and Processing”
20. TCP/ETH/2901 “Cactus Pear (*Opuntia* spp.) Production and Utilization”
21. TCP/BKF/4555 “Development of an Integrated Pest Management Strategy against Rice Pests”

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- ~~22.~~ TCP/BKF/0169 “Promotion of Date Palm Production”
- ~~23.~~ TCP/BKF/6712 “Support to the Organization and Multiplication of Basic and Certified Seeds of Rice in the West of Burkina Faso”
- ~~24.~~ TCP/BKF/6715 & 9065 “Support to the Centres for Training and Crop Production for Young Girls”

Non-project activity (FAO RP)

Integrated Production Systems PAIA (PRODS PAIA) Pilot Site in the Western Region
The Special Programme for Food Security (SPFS)

Near East and Europe

- ~~9-25.~~ TCP/SYR/8926 & 2801 “Seed Potato and Date Palm Seedlings Production”
- ~~10-26.~~ GCP/SYR/009/ITA “Range Rehabilitation and Establishment of a Wildlife Reserve in the Syrian Steppe (Consolidation Phase)”
- ~~11-27.~~ TCP/EGY/8923 & 2801 “Training in Hybrid Rice Technology through Technical Cooperation between Developing Countries”
- ~~12-28.~~ TCP/EGY/0166 “Green Food from Green Roofs (GFGR) in Urban and Peri-Urban Environments in Egypt”
- ~~13-29.~~ TCP/ GEO/8922 “Rehabilitation of the Viticulture Sector”
- ~~14-30.~~ TCP/ GEO/0065 “Assistance for the Rehabilitation of the Fruit Sector”

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Asia

- ~~15-31.~~ IND/98/140 “Development of Hybrid Rice Technology for Large-scale Adoption in India”
- ~~16-32.~~ TCP/IND/6713 & 9065 “Greenhouse Floriculture Technology for Small-scale Farmers”
- ~~17-33.~~ TCP/IND/0169 “Improvement of Banana Production for Small-scale Growers”
- ~~18-34.~~ TCP/VIE/6614 “Strengthening National Capacity for Hybrid Rice Research and Hybrid Seed Production Technology”
- ~~19-35.~~ TCP/VIE/8823 “Fruit Fly Management”
- ~~20-36.~~ TCP/VIE/0065 “Cultivation of Edible Mushrooms in Thai Binh Province”
- ~~21-37.~~ TCP/CPR/6715 “Strengthening the Central Seed Testing Laboratory and Training Centre, Shandong”
- ~~22-38.~~ TCP/CPR/8924 & 2801 “Promotion of Non-Polluting High Quality Vegetable Production in Mountain Areas, Anhui Province”
- ~~23-39.~~ TCP/CPR/0065 “Capacity Building in Forage Seed Production in Xinjiang Autonomous Region”
- ~~24-40.~~ TCP/CPR/0066 “Development of Sweet Sorghum for Grain, Sugar, Feed, Fibre and Value-Added By-Products in the Arid, Saline-Alkaline Regions”
- ~~25-41.~~ TCP/CPR/0169 “Integrated Control of Peanut Nematode Disease in Shandong Province”
- ~~26-42.~~ TCP/THA/0167 “Training on Integrated Crop Management Technologies for Production of Good Quality Rice Seeds”

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Annex 1

REPORT OF THE EXTERNAL PEER REVIEW PANEL

142. The External Peer Review Panel on the Evaluation of the FAO Crop Production Activities, consisting of Drs. Lukas Brader, R.S. Paroda, Geletu Bejiga, Alberto Duque Portugal and Ms. Jamie Watts, met in Rome from 30 June-2 July 2003 and had detailed discussions with Senior Management and concerned scientists in the Agriculture Department as well as with staff from other Departments concerned, including PBEE. The Panel considered the draft Evaluation Report, the views of the staff and also the current strategic framework of FAO and the Medium-Term Plan.

General Observations

- i. The Panel considers the decision of the Programme Committee to evaluate FAO activities in Crop Production both strategic and timely for the required reorientation of the programme design and implementation in consonance with the Strategic Framework and the new programming model.
- ii. The Panel appreciates the very systematic and professional evaluation process which has highlighted both strengths and weaknesses, and the need for programme restructuring.
- iii. The Panel is impressed by the commitment of the persons interviewed to the proposed programme change aimed at achieving an adequate balance between normative and operational functions of the Crop and Grassland Service (AGPC) and to effective collaboration with other FAO units for a much needed inter-disciplinary approach.
- iv. The Panel broadly agrees with the conclusions and recommendations presented in the Evaluation Report.
- v. The Panel is of the view that FAO's role in Crop Production is key to the efforts to improve global food security, as well as sustainability of agricultural production systems in different agro-ecologies. In order to accomplish these goals, the Panel strongly endorses a shift in FAO's work away from commodity/disciplinary lines towards a more inter-disciplinary approach focused on major production systems.
- vi. The Panel notes that funding support for the Service has declined over the years. A shift towards an inter-disciplinary approach would demand expanded partnerships and possibly additional resources. A long-term funding strategy to support new innovative normative functions needs to be put in place with a definite timeframe.

Recommendations

1. Programme Reorientation

1.1 Production Systems Approach

143. The strength of AGP lies in providing a neutral forum, as well as supplying effective technical services and policy advice on matters related to crop and grassland production. The re-orientation of the programme from a commodity approach to a sustainable production systems/agro-ecologies approach will require restructuring, cutting across disciplines and departments and changes in work plans. To achieve this goal in a given time frame, leadership commitment and resources will be necessary. The priority areas for such an approach could be: crop/livestock production systems; horticultural/industrial crops-based production systems for diversification; and rice-based production systems.

1.2 Normative Functions

144. AGPC should shift its focus more towards normative functions. Further linking field activities with normative functions would provide both visibility as well as impact. In order to achieve this, AGPC needs to clearly define its niche. Some of the normative functions suggested

could be: good agricultural practices for integrated crop production systems; important Research and Development (R & D) networks; alternative crops for diversification; policy and strategic crop production related issues; and information dissemination through publications and databases.

1.3 Linkages

145. Inter-disciplinary, inter-divisional and inter-organizational linkages are critical for needed programme prioritization, complementarity and subsidiarity, cost-sharing and effective implementation of mutual priorities. The Panel agrees that the establishment of inter-disciplinary teams working on production systems is an important step to increase linkages. In addition, stronger linkages must be developed within the Organization by giving a more effective role to PAIAs and IDWGs and through better integration of Regional and Sub-regional Office staff, and with other key organizations outside FAO including the National Agricultural Research System (NARS), Sub-Regional and Regional Fora, CGIAR and the Global Forum on Agricultural Research (GFAR). AGPC could become a key factor in linking research and development in crop production. This will require effective coordination, monitoring and the necessary resources devoted to it.

2. Programme Activities

2.1 Crop Biotechnology

146. The Panel is convinced that AGP could play an important role in the field of crop biotechnology, (i) for accelerated plant breeding through sustainable use of genetic resources, and (ii) on issues of policy advocacy, public awareness, biosafety and Intellectual Property Rights (IPR) linked legal instruments. This will require the strengthening of partnerships for increased use of biotechnology as well as capacity-building in Member Countries.

147. Accordingly, the Panel endorses the recommendation in the Evaluation Report that FAO crop biotechnology expertise be brought together under the umbrella of the Plant Production and Protection Division for better coordination and also for the faster adoption of biotechnology for improved productivity and profitability by resource-poor farmers.

2.2 Crop Breeding and Seed Production

148. In view of shifting trends in the field of plant breeding, from the public to the private sector, especially through accelerated use of biotechnology and IPRs, there is an urgent need to strengthen plant breeding, including biotechnology, by the public sector. This is needed to maintain a proper balance between public and private sector investments, as well as between conventional plant breeding and biotechnology activities to ensure that the problems faced by resource-poor farmers are addressed. Therefore, building plant breeding capacity in the public sector to strengthen the seed and crop improvement chain at national and sub-regional levels must be a priority for AGPC in collaboration with AGPS and AGPP.

2.3 Networks

149. The Panel agrees with the recommendation in the Evaluation Report to critically examine FAO's crop production networks to identify effective, high priority networks and those that should no longer be supported or new networks that might be needed to better focus on a systems approach. The Panel would like to highlight the importance of networking to FAO's normative work in crop production. To help ensure that networking is applied most effectively, the Panel recommends that a strategy for networking in crop production be developed on priority. The network should be targeted to address specific problems and/or issues of mutual interest to member countries within a specific time frame.

2.4 Publications

150. The Panel reiterates the importance of information as key to FAO's normative role. Hence, the Panel recommends that FAO undertake a much more strategic approach to

publications with better targeting of publications, and an efficient distribution programme. The Panel also recommends that FAO develop a more effective system of tracking and monitoring its publications, since this is such an important work area.

2.5 Field Activities

151. The Panel notes with interest the positive results achieved through various crop production field projects. Many of these projects have clearly benefited from the technical support provided by AGPC. The Panel endorses the two most critical issues raised in the evaluation report, i.e. (i) appropriate project design and (ii) the achievement of sustainable effects and impact. The latter largely depends on effective linkages with relevant partners and institutions in the countries concerned.

152. The Panel endorses the recommendations presented in the evaluation report with respect to the TCP projects, in particular to ensure that (i) projects assist in advancing normative work, (ii) appraisal criteria are aimed at achieving maximum impact, and (iii) the project design reflects an integrated perspective, including economic and marketing aspects. The Panel highlights the importance of the capacity-building role of field projects, and the effective monitoring of progress made in this area.

153. The above as well as other issues raised in the evaluation report would merit a more strategic review of TCP-supported projects. This, to identify ways and means to further increase the relevance and effectiveness of TCP-supported projects.

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Annex 2

MANAGEMENT RESPONSE (AG DEPARTMENT)

154. Management appreciates the methodology used for this evaluation, which included wide consultation with member countries, other clients and partners, and the involvement of an External Peer Review Panel. The process enabled a balanced assessment of both normative and field-oriented activities, and of the roles and contributions of all the concerned FAO units. Management considers that the evaluation was fair and objective.

155. Management notes the general congruency between the evaluation report and the outcome of the External Peer Review Panel. The specific findings, comments and recommendations are constructive, valuable and generally practical. They provide forward looking guidance that provides the foundation for further reshaping FAO's crop production programmes and services to better meet the challenge of improving food security and the sustainability of agricultural production systems.

156. Based on the evaluation, Management will accelerate the reorientation of crop production programmes to increase normative work, especially policy advice and strategy development more in balance with technical services, on major production systems. Emphasis will be placed on crop/livestock and rice-based systems, as well as on comprehensive horticulture development for diversification and income generation. These will part of an enhanced effort, with other programmes, to develop a Good Agricultural Practices approach to practically address the economic, environmental and social dimensions of Sustainable Agriculture and Rural Development (SARD). Activities on crop commodity groups will be deemphasized. Supporting this reorientation, the Crop and Grassland Service (AGPC) will form interdisciplinary, thematic teams, including outposted staff, and strengthen internal partnerships and collaboration such as through the PAIAs on Integrated Production Systems and Livelihoods. Expanded partnerships with CGIAR, GFAR and other international and regional institutions will be pursued to obtain specialist services and to benchmark development activities.

157. Management concurs with the recommendations to facilitate the strengthening of plant breeding activities, including biotechnology and biosafety in national programmes, for sustainable use of plant genetic resources for food and agriculture (PGRFA). As plant biotechnology is used primarily to enhance crop improvement, the main technical support to member countries on biotechnology will logically be coupled to plant breeding. This is consistent with the recommendation to enhance and bring together within the Plant Production and Protection Division (AGP) both plant biotechnology and crop-related biosafety with its regulatory aspects, linking directly to existing seed and phytosanitary regulatory instruments in the Division. Some evidence for this new focus on sustainable use of PGRFA can be seen in the PWB 2004-2005 under the new entity 212A9, which couples work on plant breeding and applications of biotechnology to an increased emphasis on sustainable seed systems for developing countries. Management is in full agreement that emphasis must be given to assist member governments to bridge the gap that prevails between conventional plant breeders and biotechnologists to yield tangible products that meet the needs of both farmers and consumers.

158. The recommendation for enhancing planning and joint implementation of plant breeding related biotechnology work by AGE (Joint FAO/IAEA Division) and AGP is well taken. There is a growing linkage between the plant breeding activities of AGP and associated mutation breeding efforts of AGE. Similarly, as some plant biotechnology methods involve isotopes, provision of related training that is part of AGE's programme of work has direct relevance to the work of AGP. Annual planning meetings will ensure concrete progress in convergence and complementarity of programmes to better serve member countries.

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159. In developing and delivering programmes and services, Management seeks to balance policy advice and strategy development with capacity building and field-level actions. It was noted by the evaluation that member governments rated the field projects in crop production to be helpful, relevant and generally of high quality, and that they had more substantive - and thus likely more long-term - impact when they were linked to, or nested within larger development initiatives. This supports management's view that the current approach of linking field work to normative activities enables the Organization - through such synergies - to be more effective in delivering demand-driven technical assistance as well as in provision of technical advice and decision support that is based on sound technical foundations. The recommendation to analyse the performance of modified Farmers' Field School approaches used in crop production project has been noted for action as part of project monitoring and evaluation.

160. Management has also noted the recommendations concerning the approval and implementation of TCP projects, which Members may wish to consider in the context of the policy and operational framework of the Technical Cooperation Programme.

161. Management recognizes the need, at all levels, to improve the selection, targeting and distribution of publications, and to review support to networks, as a means to disseminate and share information and knowledge. This is an ongoing effort that will be pursued within the Organization's publications and programme planning and monitoring processes.

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ACRONYMS

AGAP	Animal Production Service
AGE	Joint FAO/IAEA Division
AGL	Land and Water Development Division
AGP	Plant Production and Protection Division
AGPC	Crop and Grassland Service
AGPP	Plant Protection Service
AGPS	Seed and Plant Genetic Resources Service
AGS	Agricultural Support Systems Division
AGSF	Agricultural Management, Marketing and Finance Service
AGST	Agricultural and Food Engineering Technologies Service
CG	Encapsulated granule
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Centre for Tropical Agriculture
CIRAD	Centre de coopération internationale en recherche agronomique pour le développement
CP	Continuing Programme Activities
CRP	Coordinated Research Project
EU	European Union
FFS	Farmers' Field School
GCDS	Global Cassava Development Strategy
GCP	FAO/Government Cooperative Programme
GFAR	Global Forum of Agricultural Research
GMO	Genetically Modified Organism
GPA	Global Plan of Action
IARC	International Agricultural Research Centre
IAEA	International Atomic Energy Agency
ICARDA	International Centre for Agricultural Research in the Dry Areas
ICGEB	International Centre for Genetic Engineering and Biotechnology
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IDWG	Inter-Departmental Working Group
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
INIBAP	International Network for the Improvement of Banana and Plantain
IPGRI	International Plant Genetic Resources Institute
IPM	Integrated Pest Management

IPR	Intellectual Property Rights
IRC	International Rice Commission
IRRI	International Rice Research Institute
MGR	Mutant Germplasm Repository
MTP	Medium-Term Plan
NARS	National Agricultural Research Systems
NGO	Non-Governmental Organization
NRI	Natural Resources Institute
PAIA	Priority Area for Inter-disciplinary Action
PBEE	FAO Evaluation Service
PBG	Plant Breeding and Genetics
PBU	Plant Breeding Unit
PGRFA	Plant Genetic Resources for Food and Agriculture
PWB	Programme of Work and Budget
RedBio	Network on Plant Biotechnology for Latin America and the Caribbean
RP	Regular Programme
SARD	Sustainable Agriculture and Rural Development
SD	Sustainable Development Department
SDRE	Extension, Education and Communication Service
SDRN	Environment and Natural Resources Service
SDRR	Research and Technology Development Service
SF	FAO's Strategic Framework
SPFS	Special Programme for Food Security
SPPD	Support for Policy and Programme Development
STS	Support for Technical Services
TAMNET	Tropical Asian Maize Network
TCDC	Technical Cooperation among Developing Countries
TCP	Technical Cooperation Programme
TP	Technical Project
TS	Technical Support
UNDP	United Nations Development Programme