THE CGIAR IN TRANSITION
Implications for the Poor,
Sustainability and the
National Research Systems

Helle Munk Ravnborg

January 1992
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LIST OF ABBREVIATIONS

ADB    Asian Development Bank
AFDB   African Development Bank
AFESD  Arab Fund for Economic and Social Development
AVRDC  Asian Vegetable Research and Development Center
CGIAR  Consultative Group on International Agricultural Research
CIAT   Centro Internacional de Agricultura Tropical
CIDA   Canadian International Development Agency
CIFOR  Centre for International Forestry Research
CIMMYT Centro Internacional de Mejoramiento de Maiz y Trigo
CIP    Centro Internacional de la Papa
DANIDA Danish International Development Agency
EEC    European Economic Community
FAO    Food and Agricultural Organization of the United Nations
FSR    Farming Systems Research
IARC   International Agricultural Research Centre
IBPGR  International Board for Plant Genetic Resources
IBSRAM International Board for Soil Research and Management
ICARDA International Center for Agricultural Research in the Dry Areas
ICRAF  International Council for Research in Agroforestry
ICIPE  International Center for Insect Physiology and Ecology
ICLARM International Center for Living Aquatic Resource Management
ICRISAT International Crops Research Institute for the Semi-Arid Tropics
ICW    International Centres Week
IDB    Inter-American Development Bank
IDRC   International Development Research Centre
IFAD   International Fund for Agricultural Development
IFDC   International Fertilizer Development Center
IFPRI  International Food Policy Research Institute
IIMI   International Irrigation Management Institute
IITA   International Institute of Tropical Agriculture
ILCA   International Livestock Center for Africa
ILRAD  International Laboratory for Research on Animal Diseases
INIBAP International Network for the Improvement of Banana and Plantain
INSAH  Institut du Sahel
IRRI   International Rice Research Institute
ISNAR  International Service for National Agricultural Research
ITC    International Trypanotolerance Center
IUFRO  International Union of Forestry Research Organization
NARS   National Agricultural Research System
ODA    Official Development Assistance
OECD   Organization for Economic Cooperation and Development
OPEC   Organization of Petroleum Exporting Countries
SACCAR  Southern African Centre for Cooperation in Agricultural Research
SIDA   Swedish International Development Agency
SPAAR  Special Program for African Agricultural Research
TAC    Technical Advisory Committee
UNDP   United Nations Development Programme
UNEP   United Nations Environmental Programme
USAID  United States Agency for International Development
WANA   West Asia & North Africa
WARDA  West Africa Rice Development Association
INTRODUCTION

New concerns have made recent years a period of transition for the Consultative Group on International Agricultural Research (CGIAR). These include concerns with poverty, agricultural production in sub-Saharan Africa, sustainability, national research systems, and not to be forgotten, the overall relevance of research conducted by the International Agricultural Research Centres. The process of change has in large part been encouraged by the donors to CGIAR. Yet, during the writing of this paper, donors once again have let the Centres down with regard to their application for financial support for 1992 - donors pledged only US$ 251 mio. to the CGIAR’s core funding or US$ 82 mio. less than the application. This makes 1992 the third year in succession with stagnant or declining donor contributions. Thus, from a financial point of view, the CGIAR is in a period of stagnation.

This paper describes the CGIAR in transition and analyzes the implications for the poor, sustainability and the national research systems. In conclusion, it discusses whether the ongoing process of transition is genuine, i.e. the prospects for the emergence of a substantially altered CGIAR.

A Danish language version, published in 1989, has preceded this paper (Ravnborg 1989). Initially, the idea was to translate this version into English for a wider audience. Very soon, however, it became clear that much had to be rewritten and that entirely new sections should be included to do justice to recent developments within the CGIAR.

In this sense, attempting to describe the CGIAR is like trying to hit a moving target. Since 1989, the CGIAR has been expanded with new centres and new areas of research. A new ecocregional, and more resource management oriented approach has been proposed to supplement the "traditional" global and commodity oriented approach, and the long-standing issue of CGIAR’s relationship with national research systems is now being scrutinized. Thus, the need for revisions was no surprise. What is surprising is that some chapters, particularly those dealing with the poverty and sustainability focus in CGIAR research, could remain almost unchanged!

It is my hope that this paper can - and will - be read in many ways - both from A to Z and at random. Especially for those who prefer the random approach, the following brief outline of the paper is intended as a guide.

Chapter 1 provides an introduction to the CGIAR describing its origin, its objectives and size, and its global and regional importance.

In periods of rapid change, it is often valuable to step aside for a moment and recapitulate how the changes came about - what were their backgrounds, which were the problems to be solved, and what has so far been achieved. Chapter 2 is intended to provide such a
breathing space by tracing the backgrounds for the ongoing changes. Thus, it describes and comments the discussions and changes which have evolved since the mid-'eighties, when the need for change within the CGIAR was first recognized, until today.

Chapters 3, 4 and 5 should be seen as issue papers, each discussing the implications of recent changes for the sustainability and poverty focuses in CGIAR research and for CGIAR’s relationship with national research systems.

Finally, chapter 6 - the concluding chapter - summarizes by discussing the prospects for genuine changes within the CGIAR as such, and more specifically, with respect to CGIAR goals of alleviating poverty, enhancing sustainability and improving the relationship with national research systems. An executive summary of chapter 6 - Vital Issues of Genuine Transition in the CGIAR - is found in the box that follows.

ACKNOWLEDGEMENTS

Making a study like this as a desk study, from my office at the Centre for Development Research (CDR) in Copenhagen has only been possible due to the interest taken in my work by Head of Research Section Ebbe Schiøler and Head of Department Klaus Winkel, DANIDA. Both have tried to keep me up-to-date by supplying me with reports and information on current developments within the CGIAR and have made valuable comments throughout the preparation of this paper for which I am very grateful. I also wish to thank Research Director Jannik Boeset, CDR for his ready and critical comments. For translation and for correcting my 'Danish English' as well as for her patience with my almost never-ending additions, I am very grateful to Marie Bille, CDR. Finally, I am grateful to DANIDA for financing the study. The responsibility for the expressed opinions and remaining errors is, however, entirely mine.
VITAL ISSUES FOR GENUINE TRANSITION IN THE CGIAR
EXECUTIVE SUMMARY

In the course of this paper, clarifications of the following issues are identified as crucial if the ongoing process of transition should result in a CG System better able to meet concerns with the poor, with agricultural production in sub-Saharan Africa, with sustainability, the national research systems' capacity, and not least, the overall impact of research conducted by the CG Centres.

Lack of data on CGIAR activities
The data presently available seriously limits TAC's opportunities for evaluating current CGIAR activities in the light of the CGIAR mission and goals. For example, no data is available on the distribution of CGIAR expenditures for research aimed at different agro-ecological regions. Such a lack of data prevents a comprehensive and, in many respects, also meaningful discussion of CGIAR priorities and future strategies.

The ecoregional element
TAC has proposed an ecoregional element as a means to solve a wide range of shortcomings in the structure and content of CGIAR research. These shortcomings include:

* the need to conduct location-specific research to formulate "design criteria" for commodity improvement research and to adapt technical solutions,
* the lack of resource management research,
* the need to strengthen the link between international and national research

However, it is not specified how these very diverse functions should relate to each other; the amount of resources that should be allocated to undertake the respective functions; or how the interaction (division of responsibilities and competence) should function between the ecoregional entities and the rest of the CG System, particularly the global commodity Centres. This lack of clarity makes the success of the ecoregional entities questionable.

National research systems
The need to strengthen national research systems, especially in sub-Saharan Africa, is one of the preconditions for the effectiveness of CGIAR research, and as such it is a growing concern within the CG System, and particularly among some of its donors. TAC's deliberations on this aspect are centred around the role of the ecoregional entities, which are proposed to undertake the adaptive research which national systems are considered too weak to carry out. This proposal entails a danger of substituting rather than strengthening the weak national research systems. Therefore, TAC's proposals need careful reconsideration.
EXECUTIVE SUMMARY - continued

Sustainable food production
Sustainable food production has been an explicit CGIAR goal for more than five years. However, only concerning the conservation of resources such as forests and plant genetic resources, some agreement has been reached, allowing the formulation of concrete initiatives. Although strategic and applied resource management research has been accepted as an independent area of research, it is still far from clear whether all ecoregional entities should undertake research on all resources, how many resources should be allocated to this type of research and how it should relate to other research areas. Similarly, it is not at all clear what the content of the CGIAR research programme sustainable production systems should be, whether, for instance, it is seen as identical with adaptive research.

Poverty focus
A poverty focus has an even longer history as a CGIAR goal than the sustainability focus, and thus the discrepancy between the intention and the lack of concrete initiatives to meet this goal is even more marked in this case. In recent years, very little attention has been devoted to the poverty focus in CGIAR research. As an example, the social and economic dimensions are totally absent from the plans for location-specific research to be undertaken by the ecoregional entities.

Hence, it is still an open question whether CGIAR research should contribute to the alleviation of poverty or inequity. Very little is known about the poor and very little is done to direct CGIAR research to meet the needs and resource constraints of the poor. Unless efforts are strengthened in these respects, the claimed poverty focus of CGIAR research will rapidly fade away.
CHAPTER 1
THE CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH - an introduction

In the Danish language edition of this paper published in 1989, it was possible to introduce this chapter by saying that the international agricultural research system, the CG System\(^1\), consisted of 13 Centres. Were this publication to be written in 1992 or 1993, the number of international Centres would be 19, but written in 1991 it makes only little sense to state any number. This is only one indication that the CG System is in a process of change. These changes and some of their most important implications are the subject of this paper.

1.1 The CGIAR

The first initiatives to establish what is known today as the CG System were taken in 1960 by Rockefeller and Ford Foundations, when they founded IRRI\(^2\) in the Philippines. IRRI became a success. Hence, on this background, the two foundations, together with other private foundations, transformed the existing wheat and maize breeding programme in Mexico to CIMMYT in 1966, and in 1967 they founded CIAT in Columbia and IITA in Nigeria.

Gradually, as the number of centres increased and research programmes took shape, costs also increased. The foundations were therefore forced to contact public aid organizations in order to persuade them to contribute economically to international agricultural research for developing countries. A few aid organizations, such as USAID and CIDA, had already showed interest by supporting the Centres for some years, but more permanent financial support was needed.

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\(^1\) CG, CGIAR or simply the Group or the System stands for Consultative Group on International Agricultural Research.

\(^2\) The names and mandates of the CGIAR Centres are given in Map 1.
After various attempts to establish contacts between the Ford and Rockefeller Foundations on the one hand, and multi- and bilateral aid organizations on the other, the Rockefeller Foundation, in April 1969, arranged a meeting at its conference centre in Bellagio, Italy. Participants other than the foundations were representatives from such donor organizations as the World Bank, FAO, UNDP, SIDA and USAID. Robert McNamara, who had been appointed President of the World Bank in 1968, represented the Bank. Before his appointment, he had been director of the Ford Foundation and was therefore very familiar with its work and eager to find a solution. It was also he who put forth the idea of establishing an advisory group or consortium for international agricultural research for developing countries. Discussion of various possible funding arrangements for the centres continued throughout the following year, until in November 1970, McNamara invited 15 governments to participate in a preliminary meeting in what was to become the "consultative group for international agricultural research" to be held in January 1971. The World Bank also offered to serve as secretariat for the CGIAR and to administer its finances. In this way, the international agricultural research system as we know it today became a reality (Baum 1986).

The establishment of CGIAR did not immediately lead to more stringent leadership of the work of the Centres. The private foundations required that CGIAR, in addition to increasing funding, confined itself to only advisory and coordinating functions.

CGIAR holds two meetings annually - the mid-term meeting held in May in one of the CG member countries, and the so-called International Centres Week (ICW) held in October-November in Washington, D.C. These meetings have no formal decision mandate, but serve as a forum for discussion to guide and coordinate research of the individual Centres. To assist donors in these discussions, a 'technical advisory committee' (TAC) has been established, residing in FAO in Rome. TAC has recently been expanded from 15 to 19 distinguished international experts from developed and developing countries. TAC carries out continuous reviews of the Centres, of overall priorities and strategies for the CG System, as well as of topics of current interest. The specific research programmes and plans, however, are drawn up by the Centres themselves, each one being assisted by international boards of scientists appointed on the basis of their individual capacities and merits.
The CG System's very loose structure has explicitly been emphasized as positive by almost all evaluations made of the System since its foundation.

The creation of CGIAR meant, as planned, a gradual transition from private to public donor funding of international agricultural research. During the period 1972-1976, the contributions from private foundations amounted to about 19% of the CG System's core budget, decreasing to around 3% in the period 1977-1981, and to around 1% in 1987 (see table 1.1).

Any country or organization, public or private, that shares the objectives of the group and is prepared to contribute a minimum of US$ 500,000 annually to its core expenditures can become a member. The number of continuing members has increased from scarcely 20 in 1971 to almost 40 (36 donors contributed to the System in 1991). In addition to the continuing members, ten fixed-term members are appointed among the "client countries" for a period of four years. Two countries are elected from each of the five "FAO" regions - sub-Saharan Africa, Asia & the Pacific, Latin America & the Caribbean, Near East & North Africa, and Southern & Eastern Europe.

In addition to the core programmes, donors support a number of special projects. Though generally in line with the core programmes assigned the highest priority by TAC and the Centres and approved by the Group, such special projects lie outside those activities.

Table 1.1 shows the contributors to the Centres' programmes and the size of the contribution in 1972-1991.

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3 However, exemptions are apparently made from this rule; table 1.1 shows that a number of members contribute less than 0.5 mio. US$. 
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Leverhulme Trust</td>
<td>0.65</td>
<td>0.60</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Rockefeller</td>
<td>3.42</td>
<td>0.80</td>
<td>0.80</td>
<td>0.93</td>
<td>1.42</td>
<td>0.19</td>
<td>0.56</td>
<td>0.99</td>
<td>1.49</td>
</tr>
<tr>
<td>Foundations Sub-total</td>
<td>7.19</td>
<td>2.26</td>
<td>2.30</td>
<td>1.72</td>
<td>2.49</td>
<td>0.97</td>
<td>1.39</td>
<td>3.27</td>
<td>3.11</td>
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<td>International organizations</td>
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<tr>
<td>AFDB</td>
<td>-</td>
<td>0.02</td>
<td>-</td>
<td>0.72</td>
<td>1.58</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.72</td>
</tr>
<tr>
<td>Arab Fund</td>
<td>-</td>
<td>0.24</td>
<td>0.34</td>
<td>0.35</td>
<td>-</td>
<td>-</td>
<td>0.04</td>
<td>0.34</td>
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<tr>
<td>ADB</td>
<td>0.06</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>0.64</td>
<td>0.72</td>
<td>0.64</td>
<td>0.72</td>
</tr>
<tr>
<td>EEC</td>
<td>-</td>
<td>4.72</td>
<td>6.58</td>
<td>9.19</td>
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<td>1.37</td>
<td>0.21</td>
<td>7.95</td>
<td>9.4</td>
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<td>IDB</td>
<td>2.23</td>
<td>8.10</td>
<td>8.17</td>
<td>10.55</td>
<td>6.89</td>
<td>-</td>
<td>-</td>
<td>8.17</td>
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<tr>
<td>IDRC</td>
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<td>1.30</td>
<td>0.63</td>
<td>1.06</td>
<td>1.82</td>
<td>1.68</td>
<td>3.12</td>
<td>2.31</td>
</tr>
<tr>
<td>IFAD</td>
<td>-</td>
<td>5.94</td>
<td>3.15</td>
<td>0.28</td>
<td>0.72</td>
<td>2.11</td>
<td>0.71</td>
<td>5.26</td>
<td>0.99</td>
</tr>
<tr>
<td>OPEC Fund</td>
<td>-</td>
<td>3.58</td>
<td>1.00</td>
<td>0.28</td>
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<td>0.05</td>
<td>0.06</td>
<td>1.05</td>
<td>0.34</td>
</tr>
<tr>
<td>UNDP</td>
<td>1.48</td>
<td>6.19</td>
<td>7.49</td>
<td>8.99</td>
<td>6.62</td>
<td>1.36</td>
<td>0.21</td>
<td>8.85</td>
<td>9.2</td>
</tr>
<tr>
<td>UNEP</td>
<td>0.19</td>
<td>0.18</td>
<td>-</td>
<td>0.05</td>
<td>-</td>
<td>0.02</td>
<td>-</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>World Bank</td>
<td>3.23</td>
<td>16.30</td>
<td>28.10</td>
<td>30.00</td>
<td>35.11</td>
<td>0.77</td>
<td>0.2</td>
<td>28.87</td>
<td>30.2</td>
</tr>
<tr>
<td>Organizations Sub-total</td>
<td>7.98</td>
<td>46.47</td>
<td>56.13</td>
<td>61.04</td>
<td>66.12</td>
<td>8.14</td>
<td>3.83</td>
<td>64.27</td>
<td>64.87</td>
</tr>
<tr>
<td>TOTAL</td>
<td>38.17</td>
<td>143.83</td>
<td>170.18</td>
<td>211.54</td>
<td>236.24</td>
<td>35.28</td>
<td>40.22</td>
<td>205.46</td>
<td>251.76</td>
</tr>
</tbody>
</table>

1) Annual average.
2) Preliminary CGIAR Secretariat estimates.
Sources: CGIAR Annual Reports and CGIAR 1991b.
1.2 CGIAR Mission and Goals

As the number of both Centres and donors has gradually increased, the need has arisen for a more precise and comprehensive formulation of the CG System’s goals and strategy. Instead of the formulation, "to increase the quantity and quality of food production in developing countries with regard to not only technical, but also ecological, economic and social factors" (CGIAR 1981), it was agreed in 1986 to introduce the concept of sustainability and an explicit focus on low-income people (TAC 1985:26). Furthermore, at ICW 1990, a new goal, or mission statement as it was now called, was approved by the Group:

"Through international research and related activities, and in partnership with national research systems, to contribute to sustainable improvements in the productivity of agriculture, forestry and fisheries in developing countries in ways that enhance nutrition and well-being, especially among low-income people." (TAC 1990b:87)

The mission statement implies a focus on:
- international research that complements and supports national research efforts;
- complementary activities aimed at strengthening national research capacities, such as specialized training and information services, but excluding other development or technical assistance activities;
- satisfying human needs through agriculture, forestry and fisheries, without degrading the environment or the natural resources on which they depend;
- the large number of poor people and the importance of technological change in generating new income streams for them (TAC 1990b:87-88).

For the purpose of setting priorities and in consequence of the overall mission statement, TAC identified the following nine goals to which CGIAR research should contribute:

1. Effective management and conservation of natural resources (i.e. land, water, forests and germplasm) for sustainable production;

2. Improved productivity of important crops and their integration into sustainable production systems;

3. Improved productivity of important livestock and their integration into sustainable production systems;

4. Improved productivity of important trees and their integration into sustainable production systems;

5. Improved productivity of important fish and their integration into sustainable production systems;
6. Improved utilization of agricultural, forestry and fish products in both rural and urban areas through improved post-harvest technology;

7. Improved diet, family welfare and equity (including gender equity), through better understanding of the human linkages between production and consumption;

8. Appropriate policies for increased productivity in agriculture, food, fisheries and forestry and for the sustainable use of natural resources;


Figure 1.1 shows the allocation of CGIAR resources to the programme areas.

Figure 1.1
CGIAR Expenditures by Programme, 1981-1991, percentage distribution

Notes: Figures for 1991 are according to planned expenditures.

Abbreviations:
NARS: Strengthening national research systems
FSR/RM: Farming Systems Research & Genetic Resources/Resource Management
Support: Research Support
Management: Research Management

Sources: CGIAR Annual Reports; CGIAR 1991b.
As is evident from the figure, the distribution of resources to the various research programmes has only changed little over the past decade. This point will be discussed in more detail in chapter 2.

1.3 The CGIAR Centres

When established in 1971, the CG System consisted of four international centres: IRRI and CIMMYT with global mandates to focus respectively on rice, and on maize and wheat; and CIAT and IITA, which rather than global commodity mandates had regional mandates to focus respectively on the low-lying tropics of Latin America and the humid and sub-humid tropical areas in Africa. The Centres' mandates were thus from the beginning defined in different ways. While some had a global responsibility for a single or few commodities, others were concerned with many commodities but within a specific region. The Centres, as often described, were established in response to identified needs, according to a strategy of gap-filling rather than from a coherent plan of global action (TAC 1985:25). It is only recently that a need has arisen to develop a more streamlined system.

Already before the establishment of CGIAR in 1971, it was apparent that one of its first tasks would be to consider an expansion of the system with more centres. ICRISAT in India, which focus on semi-arid areas without irrigation possibilities and with a global responsibility for sorghum, millet, chickpeas, pigeonpea and peanuts - all commodities characteristic of semi-arid areas, became the first Centre to be established (in 1972) after CGIAR’s inception.

After that followed CIP in Peru, also in 1972, with global responsibility for potatoes and sweet potatoes; ILRAD in Kenya in 1973; IBPGR in Rome in 1974; WARDA in Ivory Coast also in 1974; ILCA in 1975 in Ethiopia; and ICARDA in Syria in 1976. After the founding of IFPRI and ISNAR in 1979 in USA and Holland, respectively, the CG System gained the size maintained throughout the 'eighties. Decisions taken at the ICW 1990 imply that ICRAF, IIMI and INIBAP will be included as full-fledged members from 1992, and that ICLARM as well as a new established Centre for forestry research, CIFOR, will also be included as members.

Map 1 presents all the 'old' and 'new' CGIAR Centres and their present research, commodity and geographic focus.
Map 1. Names and Locations of CGIAR Centres and their Research Focus.
Three of the Centres, IBPGR, IFPRI and ISNAR, differ from the others in that they do not work directly with production-related agricultural research. IBPGR is best described as a service organization for gene banks around the world, including those at the other CGIAR Centres. Its task is to coordinate, strengthen and support initiatives to conserve global plant genetic resources. IFPRI differs in that it is a social science research institute, while ISNAR works both as a service and research institute to strengthen national agricultural research institutions of the developing countries. According to the newly adopted terminology, this type of Centres are referred to as a “subject matter” Centres. Thus, in addition to ISNAR, IBPGR and IFPRI, also IIMI, with focus on irrigation management, will belong to this category of CGIAR Centres.

Among the other Centres, some work almost exclusively on genetic improvement of one or more commodities. This group includes IRRI, CIMMYT, CIP and WARDA. Other Centres have a more production system oriented focus. In consequence, these Centres work partly on genetic improvement of several different commodities, and partly on production systems and techniques. This is the case for CIAT, IITA, ILCA, ICRISAT and ICARDA. Finally, ILRAD, with its focus on cattle diseases, cannot be placed in any of the above categories.

The on-going changes within the CG System attempting to streamline the various kinds of mandates are discussed in further detail in chapter 2.

Table 1.2 shows the percentage distribution of CGIAR expenditures among the Centres from 1975-1989.
Table 1.2
CGIAR Expenditures (core & non-core) by Centre, 1975-1989, percentage distribution

<table>
<thead>
<tr>
<th>Centre</th>
<th>1975</th>
<th>1980</th>
<th>1985</th>
<th>1987</th>
<th>1989</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRRI</td>
<td>21</td>
<td>15</td>
<td>14</td>
<td>13</td>
<td>12</td>
</tr>
<tr>
<td>CIMMYT</td>
<td>18</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>IITA</td>
<td>20</td>
<td>14</td>
<td>15</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>CIAT</td>
<td>13</td>
<td>12</td>
<td>11</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>CIP</td>
<td>6</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>ICRISAT</td>
<td>12</td>
<td>10</td>
<td>11</td>
<td>16</td>
<td>13</td>
</tr>
<tr>
<td>ILRAD</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>ILCA</td>
<td>3</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>WARDA</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>IBPGR</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>ICARDA</td>
<td>-</td>
<td>9</td>
<td>10</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>IFPRI</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>ISNAR</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>


1.4 CGIAR Research in a Wider Context

In a global context, the CG System occupies only a modest position. From 1981-85, its expenditures were only 2.5% of the total public expenditures for agricultural research.\(^4\)

Seen in relation to publicly funded agricultural research in developing countries, however, CGIAR immediately becomes more visible. Here, its share in 1980 was 5% if China’s agricultural research is included and 7% if it is not. Finally, if CGIAR’s expenditures for sub-Saharan Africa (39% of the total CGIAR budget in 1984 (CGIAR 1986)) are compared with public expenditures for public agricultural research in the region, the CG System’s share is 14%. The CG System thus plays a much more significant role in agricultural research in sub-Saharan Africa than in developing countries in general. This is a result of two factors: First, the CG System allocates a large share of its resources to

\(^4\) Calculated on basis of figures given in table 1.3.
sub-Saharan Africa (approximately 40%) while secondly, the public spending on agricultural research is very low in sub-Saharan Africa compared to Asia.

Table 1.3
CGIAR Expenditures relative to Public Agricultural Research Expenditures by Region, 1981-1985, annual averages

<table>
<thead>
<tr>
<th>REGION</th>
<th>NARS expenditures (mio 1980 US$)¹</th>
<th>CGIAR expenditures (mio 1980 US$)²</th>
<th>CGIAR expenditures compared to NARS (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sub-Saharan Africa</td>
<td>372.3</td>
<td>81.1</td>
<td>21.8</td>
</tr>
<tr>
<td>Asia &amp; Pacific</td>
<td>2093.3</td>
<td>52.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Latin America &amp; Caribbean</td>
<td>708.8</td>
<td>47.8</td>
<td>6.7</td>
</tr>
<tr>
<td>West Asia &amp; North Africa</td>
<td>455.4</td>
<td>27.0</td>
<td>5.9</td>
</tr>
<tr>
<td>TOTAL developing Countries (130)³</td>
<td>3629.8</td>
<td>207.9</td>
<td>5.7</td>
</tr>
<tr>
<td>TOTAL developed countries (20)</td>
<td>4812.9</td>
<td>N.A.</td>
<td>N.A.</td>
</tr>
</tbody>
</table>

3) Figures in brackets indicate the number of countries in the regional totals.

1.5 Past and Future Rationale for International Agricultural Research
At least two factors are necessary to explain why the decision was made in the 1960s to establish international research centres. First, there existed a gap in agricultural research carried out in relation to developing countries' food production. On the one hand, developing countries' own agricultural research was too weak to be expected to produce any major 'technological breakthroughs' in the near future that would increase food production significantly. On the other hand, it was recognized that agricultural research in industrial countries was not directly applicable to the conditions of tropical agriculture. This way of perceiving the situation could, however, just as well have led to increased support for national research systems in developing countries rather than establishment of international research centres.

The second factor necessary to explain why establishment of international centres was chosen was that it was thought possible to produce technologies - or more generally, research results - with broad agro-ecological application, the so-called prototype
technologies. Thus, it was implied that the national research systems would have capacity to use and further adapt the recommendations that would result from the Centres' research.

By establishing a few international Centres instead of strengthening the many national research systems, it would be possible to make a concentrated and highly qualified research effort, that due to knowledge of and access to the industrial countries' basic and strategic research could quickly result in technological breakthroughs of significance for developing countries' food production. The international Centres should thus concentrate their efforts on applied research.

The fact that today it is possible to say that 'a green revolution' has taken place in some areas is evidence that the founders of the first international Centres had been right. The question currently being discussed within the CG System, however, is whether these conditions are still valid. To what extent do the CG Centres have to engage in strategic research in order to respond to present problems? Are basic and strategic research results available which can form a meaningful basis for the CG System's tasks in applied research? Have the national research systems, especially in sub-Saharan Africa, sufficient capacity to carry out adaptive research identified as their task by the CG System? And last but not least, is it possible in marginal, rain-fed areas such as sub-Saharan Africa to identify large areas with identical agro-ecological conditions in which a single prototype technology can be applied? Or is diversity so great that applied research will have to be carried out on the national, or even local, rather than on the international level? These are some of the questions that will be returned to in the following chapters.

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3 In the "Second Review of the CGIAR" (CGIAR 1981), four types of research were identified. Basic research is research designed to generate new understanding (e.g. how the partitioning of assimilates is influenced by plant height). Strategic research aims at identifying the solution of specific research problems (e.g. a technique for detecting dwarfing genes in wheat seedlings). Applied research is research designed to create new technology (e.g. breeding new levels of nitrogen without lodging). Finally, adaptive research is designed to adjust technology to the specific needs of a particular set of environmental conditions (CGIAR 1981:40).
2.1 Need for Change

The 'eighties was a period of change for the CG System, a period which did not end with the turn of the decade but has continued into the 'nineties. There are signs, however, that the newly published TAC review of priorities and future strategies (TAC 1991c) will mark a temporary conclusion to this process of change and that the CG System hereafter will concentrate on adjusting within its new shape.

Many factors contributed to the atmosphere of change. The growth of the CG System - the Centres, their activities, donors and budgets - created in itself a growing need to formalize and harmonize planning and priorities within the System.

Furthermore, a recognition emerged that the problems - as well as solutions - of meeting today's and tomorrow's food needs differ profoundly from those which prevailed when the CG System was established. At that time, focus was directed towards Asia whereas today it is the food shortages in sub-Saharan Africa which attract the world's attention.

Finally, after the period of steadily increasing contributions in the wake of the euphoria from the green revolution, the CG System experienced a period of modest growth in its core budget in the early 'eighties and, from 1984 to 1985 even a decline. This development was accompanied by an increase in allocations for special projects, i.e. activities lying outside the programmes given highest priority by TAC. However, the increased non-core contributions were not sufficient to compensate for the decline in core contributions and in real terms, total donor contributions declined from 1985 up to 1987. Since then, donor contributions have stagnated. The development in donor contributions (core and non-core) is shown in table 2.1 and figure 2.1.
Table 2.1
CGIAR Funding, 1972-91

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Core funding</strong> (mio US$)</td>
<td>20.1</td>
<td>77.2</td>
<td>143.8</td>
<td>164.7</td>
<td>173.2</td>
<td>170.2</td>
<td>192.2</td>
<td>201.6</td>
<td>211.6</td>
<td>224.5</td>
<td>234.9</td>
<td>236.0</td>
</tr>
<tr>
<td><strong>Non-core (special project) funding</strong> (mio US$)</td>
<td>2.0</td>
<td>9.0</td>
<td>28.0</td>
<td>23.6</td>
<td>29.8</td>
<td>39.6</td>
<td>43.4</td>
<td>41.8</td>
<td>49.8</td>
<td>47.3</td>
<td>51.4</td>
<td>60.8</td>
</tr>
<tr>
<td><strong>Total donor funding (core+non-core)</strong> (mio US$)</td>
<td>22.1</td>
<td>86.2</td>
<td>171.8</td>
<td>188.3</td>
<td>203.0</td>
<td>209.8</td>
<td>235.6</td>
<td>243.4</td>
<td>261.4</td>
<td>271.8</td>
<td>286.3</td>
<td>296.8</td>
</tr>
<tr>
<td><strong>Annual growth rate, nominal terms (%)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9.6</td>
<td>7.8</td>
<td>3.3</td>
<td>12.3</td>
<td>3.3</td>
<td>7.4</td>
<td>4.0</td>
<td>5.3</td>
<td>3.7</td>
</tr>
<tr>
<td><strong>Total donor funding (core+non-core)</strong> (mio 1989 US$)(^3)</td>
<td>75.6</td>
<td>179.1</td>
<td>268.9</td>
<td>295.6</td>
<td>325.6</td>
<td>332.6</td>
<td>301.4</td>
<td>270.9</td>
<td>271.7</td>
<td>271.8</td>
<td>275.4</td>
<td>-</td>
</tr>
<tr>
<td><strong>Annual growth rate, real terms (%)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9.9</td>
<td>10.1</td>
<td>2.2</td>
<td>-9.4</td>
<td>-10.1</td>
<td>0.3</td>
<td>0.1</td>
<td>1.3</td>
<td>-</td>
</tr>
<tr>
<td><strong>Official development assistance</strong> (mio 1989 US$)</td>
<td>-</td>
<td>-</td>
<td>52,911</td>
<td>49,606</td>
<td>54,527</td>
<td>50,418</td>
<td>42,985</td>
<td>35,839</td>
<td>37,724</td>
<td>36,600</td>
<td>45,116</td>
<td>-</td>
</tr>
<tr>
<td><strong>Annual growth rate, real terms (%)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-6.2</td>
<td>9.9</td>
<td>-7.5</td>
<td>-14.7</td>
<td>-16.6</td>
<td>5.3</td>
<td>-3.0</td>
<td>23.3</td>
<td>-</td>
</tr>
</tbody>
</table>

2) Estimated value, CGIAR Secretariat (CGIAR 1991b).
3) OECD Deflator (1989=100).

As shown in figure 2.2, the development in contributions to the CG System have largely followed the same pattern as the overall development in official development assistance (ODA) given to developing countries. Moreover, in the early 'eighties, national research systems received an increasing share of the total funds made available for agricultural research (de Janvry & Dethier 1985:82).

All these factors indicated that donors no longer agreed with the priorities set by their Technical Advisory Committee (TAC). The prolonged period with no major breakthroughs resulting from CGIAR research, particularly not for sub-Saharan Africa, combined with the CG System's apparent sluggishness in recognizing and responding to this situation, brought discredit to the CG System. One of the founding principles of CGIAR had been that research priorities and programmes should be based on purely scientific rather than political grounds. The apparent inability to respond to the new challenges posed by the food problems in sub-Saharan Africa created doubt as to the adequacy of these principles. Hence, there were strong motivations for the CG System to improve its responsiveness in order to regain the attractiveness formerly enjoyed among donor organizations. That funds for multilateral development assistance in general have
become increasingly scarce as compared to bilateral funds, has further contributed to the CG System’s difficulties in attracting donor funds.

Figure 2.2
CGIAR and ODA Funding, constant\(^1\) 1989 US$

\[\text{Figure 2.2}
\text{CGIAR and ODA Funding, constant}^{1}\text{ 1989 US$}
\]

\[\text{1 OECD deflator (1989=100)}\]

A new pattern of decision making has gradually emerged, with donors taking a still more active role and discussions becoming more politicized. Instead of TAC itself taking the initiative, donors have in recent years requested TAC to undertake a number of studies on issues which they found insufficiently covered. These issues include implications of the goal of sustainable agricultural production for international agricultural research, how the sustainability perspective hitherto has been included in the Centres' work, the need for an expansion of the CGIAR with additional Centres, and how the CG System should meet its goal of strengthening national research systems in developing countries.

The preliminary conclusion of all these studies is the expected outcome of the ongoing process of revising the overall priorities and strategies for the CGIAR research. TAC presented at ICW in 1991 its analysis and tentative conclusions concerning a review of
CGIAR priorities and Strategies (TAC 1991c). A final conclusion, however, will not be taken until the CGIAR’s mid-term meeting in Istanbul, 1992.

In the following, the process of change will be described, based primarily on the many reports which have been produced by the System, first and foremost by TAC, during recent years.

2.2 The TAC 1985 Review of CGIAR Priorities and Future Strategies

The TAC 1985 Review of CGIAR Priorities and Future Strategies, presented to the CGIAR in 1985 signalled the beginning of the almost avalanche-like process of change - seemingly much more comprehensive than TAC had intended.

TAC had itself proposed to undertake the study in order "to define an appropriate path for the development of the System so as to keep it lively, efficient and effective in an evolving environment". After complimenting the CG System for its crucial contribution in solving the acute food problems which had harassed large parts of Asia and Latin America in the 'sixties and 'seventies, the report made clear that the present situation and a look into the future reveal challenges which would necessitate changes in the CG System, or rather in its research.

The first among these changes related to the introduction of the concept "sustainable" into the goal statement. TAC, however, emphasized that this did not indicate a change but rather a strengthening: To increase sustainable food production and to strengthen national research systems have been the two central thrusts of the CG System throughout its development, it was said (my emphasis) (TAC 1985:23). Nevertheless, the changed goal statement, as well as the world-wide concern with sustainability, led the donors in 1986 to request TAC to undertake a study to define the implications of sustainable agricultural production for international agricultural research. This study which was presented to the CGIAR in 1988, will be discussed in section 2.3.

Secondly, the need was recognized to change the focus from agro-ecologically favourable areas towards more marginal areas, primarily in sub-Saharan Africa. This geographical
shift was anticipated to necessitate a higher degree of diversity or complexity, as it is said\(^6\), in technologies due to the intricate and highly variable agro-ecological conditions. Which specific changes would be needed, however, did not appear from the TAC Review. Therefore, in 1986, the CG Centres asked IFPRI to examine these implications in more detail. The report *International Agricultural Research Needs in Sub-Saharan Africa: Current Problems and Future Imperatives - Issues and Options for the CGIAR*, prepared by Peter Oram, was IFPRI’s response to that request. The report, published in 1988, is discussed below in section 2.4 on the strengthened focus on sub-Saharan Africa.

The third area where change was felt necessary related to the character of research. The gradual strengthening of national research systems was said to make it possible and the increased scope for making use of emerging biotechnologies even necessary for CG Centres to change the emphasis from applied towards strategic and basic research.

In other aspects, however, the TAC 1985 Review was largely an argument for *status quo*. This applies to the institutional and organizational shape of the system and the research approach and contents:

"TAC reaffirms the concept of the *International Center* as the appropriate organizational mechanism for conducting the System’s future research and research-related functions" (my emphasis), (TAC 1985:viii)

it was said. Thereby, TAC opposed the prevailing tendencies to decentralize and undertake research of regional rather that international relevance; tendencies which, at least by some, were regarded as imperative resulting from the strengthened focus on sub-Saharan Africa. The high proportion of CGIAR research activities aimed at sub-Saharan Africa funded via special projects, namely 42% (ISNAR 1987:19), is an expression of this decentralization tendency.

Furthermore, TAC argued in favour of a continuation of the commodity approach as the guiding principle in research organization, though with a stronger emphasis on multi-disciplinarity. By focusing on a commodity, other disciplines and aspects of the production system should be involved, such as cultivation practices (management of e.g. soil and

\(^6\) It is noteworthy that TAC uses the term "complex" instead of diverse. Conceiving the situation as "complex" is the planner’s syndrome, not the farmers’. The complexity does not relate to the technologies as such but to the facts that many diverse technologies, that the conditions under which they are supposed to work are relatively unknown, and finally that they are thought developed in international centres with wide geographical mandates.
water), integrated pest management, socio-economics etc. The multi-disciplinary commodity approach is preferred to what is termed discipline (e.g. entomology) and factor (e.g. soil, water, fertilizers) approaches to research which were argued more relevant to basic research (TAC 1985:33). Though essential for the success of CGIAR efforts in technology generation, new initiatives in factor research were not to be included in the CG System (TAC 1985:95).

In spite of the commitment to multi-disciplinary commodity research as the central research thrust, its share of total CGIAR allocations within the next 10-25 years was recommended reduced from 57% to 48%. This was to be accomplished primarily through reducing the number of commodities to be researched.

Instead, the share allocated to research in resource management and conservation was recommended to be increased from 7% to 13%. This programme includes activities on plant genetic resource conservation and management; agro-ecological characterization; land management and soil conservation; water management and conservation and energy in agriculture.

Among these activities, however, only plant genetic resource conservation and management, livestock management systems for grassland savannas and the humid tropical forests, and conservation of water resources (moisture retention) in dry areas were to be given priority. Other areas of research within resource management should be strengthened through their incorporation in commodity research and thereby "permit the CG System to more fully pursue its program thrust of enhancing sustainable agriculture" (TAC 1985:54).

Also, a closer collaboration with research institutions outside the CG System was recommended, though without specifying which institutes and which modes of collaboration.

Finally, the future size of the CG System was touched upon in the TAC 1985 Review. As the basic guiding principles for these considerations, it stressed that "the System should remain small and concentrate on selected problems of great importance" (TAC 1985:viii). However, as part of the priority assessment, TAC also evaluated activities/commodities lying outside CGIAR activities. TAC pointed to three commodities as candidates for CGIAR support after rejecting non-food crops and factor research. These were vegetables, coconuts, and aquaculture.
Though on many issues, the TAC Review largely argued in favour of status quo, the mere fact that these issues were touched upon, helped to focus donors' attention on these. This was the case for issues of international versus regionally-oriented research, commodity or productivity research versus factor or resource-management research, and finally new areas of research implying possible expansion of the CGIAR.

2.3 Focus on Sustainable Agricultural Production

In the above mentioned report from 1985, TAC introduced sustainability as a new element in the CGIAR goal statement (TAC 1985:vi). This should be seen, of course, in the context of the worldwide attention being focused on the environmental consequences of development, the theme of the Brundtland Commission's report.

After the CG System formally introduced the concept of sustainability into the goal formulation, the need arose for a more precise definition of this concept. In 1986, CGIAR decided to appoint a working group to define the implications of sustainability in the context of agricultural research and to find out how sustainability should be strengthened in the Centres' work. The working group, which consisted of members of TAC, finished its report, entitled Sustainable Agricultural Production: Implications for International Agricultural Research, in March 1988.

The report is divided into four chapters. The first chapter - "Need for Sustainable Agricultural Production" - defines the concept of sustainable agriculture and explains why now more than ever it is important to focus on sustainability. Chapter 2 examines the biological and physical as well as socio-economic factors that influence the sustainability of agricultural production. The third chapter of the report presents a summary of the research thus far carried out by the Centres dealing more or less explicitly with sustainability. Finally, the fourth chapter makes some recommendations as to how the Centres can and should further strengthen the aspect of sustainability in their research.

The first chapter can be seen as the most important part of the report, since here the problems which are said to threaten the possibilities for sustainable agriculture, and thereby also are the subjects for the Centres' future research, are identified.

7 The report was published in 1989 in FAO's series, FAO Research and Technology Paper (no. 4). The page references that follow, however, are to the 1988 publication.
The definition of sustainable agriculture is:

"... sustainable agriculture should involve the successful management of resources for agriculture to satisfy changing human needs while maintaining or enhancing the quality of the environment and conserving natural resources." (TAC 1988:2)\(^8\)

For a more profound understanding of this definition, it is necessary to consider the meaning of the individual words used:

"successful implies that the production system should generate adequate income and otherwise be economically viable and socially acceptable;

management includes policy decisions that can affect agriculture at all levels, from national governments to the individual producer.

resources includes inputs and manufactured goods coming from outside the agricultural sector (e.g. agricultural chemicals, machinery etc.).

maintaining the quality of the environment suggests that changes in the environment or the availability of natural resources should not threaten the capacity to meet changing needs and that production needs should be met without unnecessarily damaging natural ecosystems." (TAC 1988:2-3)

It is primarily population growth, it is argued, that threatens possibilities for sustainable agricultural development. The increasing population densities lead to increased pressure on natural resources and force poor farmers to expand into more marginal areas, resulting in a need to intensify agricultural production. The traditional production systems, it is said, do not provide adequate possibilities for such intensification since they are characterized by only utilizing externally produced inputs to a very limited extent (TAC 1988:6).

In the light of this presentation of the problem, the task, therefore - especially with regard to Africa - is to develop alternatives to traditional production systems. More specifically, the alternative borne in mind is termed "open production systems", i.e. systems which utilize external inputs and are able to produce a surplus. Only through such systems will it be possible to relieve the pressure on natural resources and ensure sustainable agricultural development.

Especially in relation to Asia, it will be exceedingly important from now on to carry out research on how to maintain the higher yields achieved through the green revolution’s...\(^8\)

\(^8\) Natural resources are thus not treated as part of "resources for agriculture", but instead in relation to maintenance or improvement of the quality of the environment.
introduction of improved varieties, chemical fertilizers, pesticides and irrigation. Even now, there are examples of yields reverting to "traditional levels". (TAC 1988:11)

Chapter 3 describes how CGIAR Centres have contributed to research related to sustainability. It begins by stating,

"None of the concepts described are new, nor call for work that is qualitatively different from a great deal of work that been done in the past" (TAC 1988:31).

The chapter concludes,

"While TAC recognizes the substantial contributions already made to research on sustainability by the IARCs, the needs are so great that much more needs to be done" (TAC 1988:34).

IITA's work on alley farming and ICRISAT's work on more effective utilization of water resources and intercropping are some of the examples cited. Almost all of the CGIAR Centres are named in this review for their efforts in regard to what is called organic or low-input farming. In addition, several international agricultural research centres outside the CG System are cited for their efforts, for example ICRAF, ICIPE, AVRDC, and IBSRAM.

The discussion is a more elaborate, though not more precise, in regard to TAC's recommendations on how sustainability should be strengthened in the future research at the Centres.

Like CGIAR's research today is said to be carried out from an farming systems perspective, TAC recommends that the Centres' research should be planned and carried out within a sustainability perspective. Sustainability should thus be one among other evaluation criteria, such as farmers' priorities and resource endowments, research costs, availability of inputs etc.

The considerations about sustainability until now, however, have been mostly qualitative. How to quantify long range sustainability remains an unsolved problem. The solution is not a task for the Centres alone, but rather requires cooperation among many institutions.

The discussion then turns to the implications of sustainability for the respective priority given to plant breeding and resource management in the commodity research programmes. TAC recommends that the Centres consider this balance carefully, since the problem of
sustainability will require some Centres to give higher priority to issues of resource management in their research programmes (TAC 1988:38). However, TAC reaffirms its recommendation from the 1985 Review that the multi-disciplinary commodity approach should continue as the organizing research approach as opposed to e.g. factor research. It is due to misconceptions, it is said, when the commodity focus is seen as inherently incompatible with problems related to sustainability (TAC 1988:39). (A more elaborate discussion of the TAC sustainability report follows in chapter 3.)

2.4 Focus on sub-Saharan Africa
A further consequence of TAC's 1985 report on future priorities and research strategies was a stronger focus on the problems of agricultural production in sub-Saharan Africa. As already described, TAC emphasized that this should not only mean an increase in economic and human resources, but should also bring about changes in the contents of the Centres' research programmes as a result of differences in agro-ecological conditions, e.g. between Asia and Africa.

The most obvious difference between the areas in Asia and Latin America where the green revolution took place, and sub-Saharan Africa, is the opportunities for irrigation and thereby for manipulating the agro-ecological conditions. The limited opportunities for irrigation in sub-Saharan Africa means that the agro-ecological conditions can only be modified with difficulty. Agricultural research must therefore develop technologies that, besides providing opportunities for intensification of production per area unit through sustainable utilization of natural resources, should also be applicable under agro-ecological conditions which are both very diverse with considerable seasonal variation and often marginal (still seen through green revolution spectacles!). Therefore, it will no longer be possible to develop a kind of 'prototype' production technology that, with just a few minor adjustments, is applicable over wide areas. Instead, what is required is an increasing degree of diversity (or as it is said complexity) in the technological development.

To support the development of well-founded policies for future expansion of the CGI System in Africa, the Centres' directors asked IFPRI to make a report to identify important problems and opportunities for agricultural research. IFPRI's answer to this request came in 1988 in the form of a report written by Peter Oram (Oram 1988). This report does not have the same 'official' status as the TAC reports. It is, nevertheless, included in this presentation in order to illustrate the existence of diverging opinions.
within the CG System with respect to the understanding of the problems in African agriculture and their implications for research. Furthermore, the report is interesting, because many of its recommendations, especially on the need to adopt a stronger agro-ecological or regional focus, are identical to those presently being considered by TAC and in the CGIAR.

The report describes the problems in and for African agricultural production with more detail than the TAC reports from 1985 and 1988. It distinguishes between areas with high and low population density and favourable and unfavourable agro-ecological conditions, and describes the significance these differences have for farmers' strategies for increased yields, for the national government's possibilities for carrying out its agricultural policies etc.

On the basis of this description, both a short-term and a long-term strategy is presented for the efforts of the international agricultural research Centres.

The most decisive difference between these strategies and the strategy presented by TAC in 1985 is the significance attributed to the identification of agro-ecological zones, both as an issue for research in itself, and as a principle guiding other agricultural research. While the 1985 TAC report recommended status quo for work on the classification of agro-ecological zones and instead encouraged better use of the existing information, the IFPRI report gives this work first and second priority in the short and long range, respectively. At the same time, the IFPRI report indicates that Centres working from an agro-ecological perspective or mandate have greater relevance in relation to the solution of Africa's agricultural problems than Centres working from a global mandate (Oram 1988:10).

Another important difference in relation to the 1985 TAC report is the IFPRI report's recommendation of a two-phased strategy, in which immediate priority is given to transform existing knowledge into technologies for increasing yields that can be used in agro-ecologically favourable and densely populated areas. Only in the longer term (10-25 years), priority should be given to research to increase the production capacity of more marginal areas. Furthermore, priority (third) should be given to development of production systems that reduce dependence on chemical inputs and fossil energy sources.
Finally, the IFPRI report emphasizes the link between agro-ecological and socio-economic information about the specific areas as a necessary prerequisite for the development of technologies that simultaneously increase productivity, encourage equitable distribution of resources in the population and ensure environmental sustainability of agricultural production (Oram 1988:38).

Recently, the strengthened focus on sub-Saharan Africa has been questioned. CGIAR has "gone overboard" on sub-Saharan Africa, to Asia's ultimate cost, it has been said (Gryseels & Anderson 1991:323). Also the 1991 TAC Review of Priorities and Strategies comments on this point. The preliminary conclusion made by TAC, however, is one in favour of status quo in terms of the relative distribution of CGIAR resources among the regions, but at the same time a recommendation that the issue of regional balance should be fully debated in the CGIAR (TAC 1991c:211-213).

"The rapid population growth rates coupled with declining per caput food production in sub-Saharan Africa make a compelling case for that region. The fragility of its tropical agro-ecologies and the slow rate of progress in productivity improvement to date add to the apparent urgency. On the other hand, the magnitude of population numbers, the narrowing yield gap and the limited scope for land expansion all argue strongly for more long-term strategic and applied research in Asia." (TAC 1991c:213)

In future considerations on the regional balance, it is, however, important to recall the initial reasons for shifting the focus from Asia to sub-Saharan Africa. Rather than emerging from a concern with sub-Saharan Africa as a region, the arguments were based in a concern that past CGIAR research had focused on more favourable agro-ecologies and in so doing had neglected large parts particularly of sub-Saharan Africa but also parts of Asia and Latin America with less favourable agro-ecologies. Thus, in the future discussions, considerations on the regional balance in CGIAR resource allocations should not be separated from those on the agro-ecological balance.

In this context, it is very unfortunate that information on CGIAR resource allocation does not allow for assessing whether the officially claimed change in focus towards the diverse and highly variable agro-ecologies of sub-Saharan Africa in fact has been reflected in the distribution of resources among research programmes as well as in the research focus. Data on CGIAR resource allocation is only given for major commodity groups and programme titles, and for core expenditures only. Keeping in mind, that an ISNAR
questionnaire survey revealed that close to half of the CG System’s activities in sub-Saharan Africa were financed through special projects (on which very little information is readily available) adds to the incompleteness of these data. However, judging from the development in the allocation of core research expenditures among research programmes over the past decade (figure 2.3), the effect of the many TAC reports is hardly discernible.

Figure 2.3
CGIAR Core Research Expenditures by Commodity/Programme, 1981-1991, percentage distribution

Note: RM/FSR Resource Management / Farming Systems Research

2.5 Emergence of a New CGIAR System
As discussions on the implications of sustainability and the strengthened focus on sub-Saharan Africa unfolded, still more fundamental issues and radical proposals for change were brought into the debate.

9 The mere fact that a questionnaire survey was needed to reveal this piece of information is in itself striking.
In the deliberations on sustainability, resource management became the central issue in full accordance with the 1988 TAC conception of sustainable agriculture. Nevertheless for some time, TAC maintained its 1985 recommendation not to incorporate research on resources as an independent research area in the CGIAR. Instead, it argued, more emphasis should be given to resource management issues within the commodity or productivity-oriented research while strengthening collaboration with institutions outside the CG System.

These recommendations did not satisfy donors, however. This became clear at the midterm meeting in Berlin in 1988. Whether by changing or broadening the range and content of CGIAR research or, as TAC put it, by approaching all research from a sustainability perspective, more had to be done to strengthen the sustainability perspective in CGIAR research (CGIAR 1988:1). On this background, a committee of Centre scientists was established to review Centre activities in the light of sustainability and propose changes or new initiatives that would reflect more fully a sustainability perspective. Furthermore at ICW in 1988, the Group asked TAC to undertake a review of ten non-associated international research centres for possible inclusion in CGIAR. The ten centres selected for this review carried an unambiguous signal of the research direction desired, since many of these centres were resource rather than commodity oriented. For many of the ten centres, this was not the first time to be considered for possible inclusion in the CG System. The ten centres are listed in box 2.1.

A look at the financial situation of these non-associated centres reveals a further reason for considering their inclusion as well as yet another signal of the direction which donors wished international research to take. From 1986 to 1990, contributions to the non-associated centres increased from US$33 million to US$65 million. This represents an annual growth rate of 13% in real terms, whereas contributions to the CG System during the same period only showed an annual growth rate of 1% in real terms (Gryseels & Anderson 1991:331).

The sustainability committee under the chairmanship of Leslie Swindale presented a preliminary report at the mid-term meeting in Canberra in 1989. In very general terms, this report emphasized the focus on sustainability already present in IARC research. A list of IARCs where this is "especially" the case mentions twelve out of the then thirteen CGIAR Centres. The only centre not listed is ISNAR which did not participate in the
**Box 2.1**  
Ten Centres selected for Review for Inclusion in the CGIAR

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Name</th>
<th>Location &amp; Year of Establishment</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVDRC</td>
<td>Asian Vegetable Research &amp; Development Center</td>
<td>Tainan, Taiwan 1971</td>
<td>Promote production, marketing, and utilization of vegetables with emphasis on Asia</td>
</tr>
<tr>
<td>IBSRAM</td>
<td>International Board for Soil Research &amp; Management</td>
<td>Bangkok, Thailand 1985</td>
<td>Apply principles of soil science to increase sustainable food production in developing countries</td>
</tr>
<tr>
<td>ICIPE</td>
<td>International Center of Insect Physiology and Ecology</td>
<td>Nairobi, Kenya 1970 (reconstituted in 1986)</td>
<td>Conduct advanced research in insect science</td>
</tr>
<tr>
<td>ICLARM</td>
<td>International Center for Living Aquatic Resources Management</td>
<td>Manila, Philippines 1977</td>
<td>Research topics pertaining to fisheries and aquaculture</td>
</tr>
<tr>
<td>IFDC</td>
<td>International Fertilizer Development Center</td>
<td>Muscle Shoals, Alabama, USA 1977</td>
<td>Identify and remove agronomic, technological, and economic constraints to fertilizer use</td>
</tr>
<tr>
<td>IIMI</td>
<td>International Irrigation Management Institute</td>
<td>Colombo, Sri Lanka 1984</td>
<td>Conduct research and communicate information on improved irrigation management</td>
</tr>
<tr>
<td>INIBAP</td>
<td>International Network for the Improvement of Banana and Plantain</td>
<td>Montpellier, France 1984</td>
<td>Promote research and scientific cooperation in banana and plantain improvement</td>
</tr>
<tr>
<td>ITC</td>
<td>International Trypanotolerance Center</td>
<td>Banjul, The Gambia 1982</td>
<td>Carry out studies to exploit trypanotolerance for commercial, agricultural, and food production purposes</td>
</tr>
<tr>
<td>IUFRO</td>
<td>International Union of Forestry Research Organizations</td>
<td>Vienna, Austria 1983</td>
<td>Promote international cooperation in forestry studies; standardize systems of measurement</td>
</tr>
</tbody>
</table>

* The institution has been accepted for inclusion into the CGIAR.

Source: CGIAR 1988/89 Annual Report
Sustainability Workshop on which the report was based (Leonard 1989: 6 & 27-28). Only very vague indications of gaps and needs were spelled out and only while stressing that such needs could not be met by reducing 'other' activities. Thus, the report did not differ substantially from the report already prepared by TAC on sustainability (TAC 1988). Therefore, the Group members requested the committee to consider more specifically which research activities should be changed or initiated as it proceeded in its work.

Though positively received, the second and final report from the sustainability committee fostered the same comment when it was presented a year later at the mid-term meeting in The Hague in 1990.

Also the TAC review of the ten non-associated centres received precise instructions from the Group to guide its preparation. The 1988/89 Annual Report states:

"... members made clear that they did not want simply a yes or no decision on each non-associated center, but rather judgments on whether and how the research goals addressed by each of the 10 could best be married with existing CGIAR programs - without taking as sacred either the organizational structure of the non-associated centers or the current CGIAR centers." (CGIAR 1989:3)

In the discussions on geographical focus, the need to focus more specifically on sub-Saharan Africa soon turned into a more general concern about less favourable areas with high degrees of diversity and variability. As also argued by IFPRI, this changing agro-ecological focus made Centres working within a location-specific or regional approach more likely to have an impact than those working on the basis of a global commodity mandate (Oram 1988: 10). In IFPRI’s argument, the agro-ecological mandate should not be restricted to encompass only resource management research. Also commodity improvement research should be carried out within a regional perspective in order to reflect specific agro-ecological needs.

This, however, was not part of the argument when TAC, in 1990, launched its proposal to establish ecoregional entities as a new element in the CGIAR organizational structure. Before turning to this new structure, however, the outcome of the deliberations on the possible expansion of the CG System are described.

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10 Until a decision is made with respect to the new 'ecoregional' element in the CG organizational structure, the more vague term 'ecoregional entities' rather than 'ecoregional centres' is used in the TAC documents. This "open" term does, however, also reflect that donors have differing views on how traditional "mortar-and-brick" type such entities should be as compared to "lighter", decentralized organizations.
2.5.1 New Areas of Research ... and New CGIAR Centres

The proposed expansion of the CG System was on the agenda at ICW in 1990. The CGIAR members had, however, partly preempted these discussions by agreeing on a "Declaration of Intent" at the Canberra Meeting in 1989. In this declaration, the members committed themselves

"...to continue to give emphasis to support for research on technologies and systems of enhanced food production that can be sustained by farmers over time through the efficient utilization of their renewable natural resource base, and to expand this emphasis to include research on the optimal use of tropical and sub-tropical forest lands giving particular stress to the interaction of agriculture and forestry..." (Here quoted from McCalla 1989:1).

Apart from reducing the question of the possible inclusion of forestry and agroforestry research into the CGIAR to a question of how this should be done, the declaration clearly affirmed the importance given to resource management issues.

Forestry and agroforestry research thus became the first area to be considered for possible inclusion in CGIAR. Perhaps for that reason, it also became the area of most heated discussion.

ICRAF, which had been very successful in attracting donor support, was already in existence. With its mandate to promote and develop agroforestry research, ICRAF has had a significant impact in raising awareness of agroforestry systems.

Anticipating the possible inclusion of forestry research into the CGIAR mandate, an International Task Force on Forestry Research, often referred to as the Bellagio II Task Force, had been set up in 1988. Counting twelve highly respected scientists, the Task Force’s goal was to address the need for stronger international institutional arrangements for forestry research. In their recommendations for a research programme, natural forest ecology and management, and utilization and marketing of forest products were given strong emphasis. Furthermore, the importance of integrating

"...all aspects of forestry research ... including agroforestry, social forestry at the village and farm level, through to the issue of forest land management which may impinge on the preservation of biodiversity in wilderness areas ... [as well as] the use of forest land for commercial purposes" was stressed (TAC 1990b:154).

Though placing particular emphasis on the integration of agriculture and forestry, i.e. agroforestry, the declaration of intent also concerned forestry. In its deliberations, therefore, TAC dealt with both types of research and agreed with the recommendation given
by the Bellagio II Task Force on the importance of a close, also institutional, integration between the various aspects of forestry and agroforestry research. However, TAC recommended a more selective research agenda as compared to the one proposed by the Task Force. Certain activities were thus explicitly excluded from the future CGIAR research agenda, e.g. those relating to large scale, primarily export-oriented, industrial timber production, harvesting and processing, on grounds that they do not conform sufficiently to the mission and goals of the CGIAR (TAC 1990b:162).

Among the five options considered for the institutional integration of forestry and agroforestry research, TAC recommended an integrated forestry/agroforestry centre. Further, it recommended that ICRAF could become this centre provided that it would adopt a broader mandate to also include forestry research. As an alternative recommendation, TAC suggested that a new integrated forestry/agroforestry centre should be established.

None of these recommendations were followed by the CGIAR members, however. During the discussions at ICW 90 and again at the mid-term meeting in Paris 1991, it became clear that ICRAF could not accept changing its mandate to include forestry research. While some donors supported the alternative TAC recommendation (to establish a new integrated centre), others were willing to include ICRAF with its present mandate restricted to agroforestry research while investigating the possibilities for establishing a second centre to deal with forestry research. Finally, the latter option which was approved by the CGIAR members at the Paris meeting. At ICW 1991, CIFOR was approved as the name for this new centre. Despite its name, CIFOR is foreseen to operate as a service rather than as a "traditional" commodity centre, contracting the major part of its research to other research institutions, including national institutions.

Discussions on other research areas and their related centres reportedly took a less dramatic turn, with the CGIAR members largely following the TAC recommendations (TAC 1990b:chapter 9).

IIMI, which deals with institutional, organizational and management issues related to irrigation, was accepted for immediate inclusion as a CGIAR Centre. This decision was based on the assumption that constraints to more efficient utilization of water resources are economic, political, social and institutional rather than technical. Such aspects are not
presently covered in CGIAR research. IIMI will be regarded as a 'subject-matter' centre in line with IBPGR, IFPRI and ISNAR. In the long run, IIMI might evolve as a centre dealing not only with management of irrigation water but also of other common property resources.

Also INIBAP, and thereby research on banana\(^\text{11}\), was approved for inclusion in CGIAR. TAC argued that banana and plantain are of far greater economic and social importance than is presently reflected in research, and, furthermore, their production is inherently sustainable and contributes to conserving the soil.

As its name suggests, INIBAP operates as a network rather than as a research centre. The institutional option recommended by TAC was to assign IITA the primary responsibility for banana and plantain research and to include INIBAP as an integral part of IITA. INIBAP should, however, preserve its well-known name and, for reasons of easy communication, continue to be run as a network from Montpellier, France.

Finally, AVRDC was also included, pending settlement of political issues relating to its present headquarters in Taiwan. It will have to broaden its Asian focus to encompass also Latin America and sub-Saharan Africa and subsequently change its name to International Vegetable Research Institute. When these issues will be settled is, however, uncertain.

A recommendation by TAC to include ICLARM was accepted on principle awaiting further review and ICLARM's elaboration of a focused strategic research plan. An inclusion is expected to take effect by 1993. In its deliberations on future CGIAR research on fishery, TAC stresses that CGIAR should become involved only in inland and coastal fishery research, and that it should not engage in e.g. high-input aquaculture, which is not regarded to be in line with the CGIAR mission and goals.

A decision with regard to research on coconut will be taken as part of the detailed planning of the new forestry Centre, CIFOR.

The remaining centres included in the initial list of ten non-associated centres were for various reasons not recommended for inclusion in the CGIAR.

\(^{11}\) The other commodity covered by INIBAP, plantain, is already included in IITA's mandate.
The research carried out by IFDC and IBSRAM on the one hand, and by ICIPE on the other is characterized by TAC as respectively factor and discipline-oriented. TAC's main argument for not including these centres into the CG System was that issues of soil/water relationships and of biological pest control are just as well, or even better, dealt with as part of the multi-disciplinary ecoregional programmes rather than independently. It is worth noting that the same argument could have been raised - and was, reportedly, actually voiced in the corridors of the ICW 1990 - against the inclusion of IIMI and its research on water management. Furthermore, the decision not to include research e.g. on soil/water relationships as a separate research area does not correspond to the recognition that there is a "lack of clear global responsibility for strategic research on resource management concerns" (TAC 1991a:4). Thus, in the summary from ICW 1990, it is said that

"Some concerns were expressed, however, that there was an inconsistency between the analytical emphasis on natural resource management and individual recommendations regarding some non-associated centers whose programs were particularly oriented towards research connected with natural resources." (CGIAR 1990:3)

2.5.2 Ecoregional Entities as a New Element in the CGIAR Structure

Perhaps due to the unambiguous signal given by the Group that nothing was sacred, not even the organizational structure, TAC proposed in 1990 a new organizational framework containing ecoregional as well as global entities. Two major reasons were given for introducing this new element. First, the issue of sustainable production systems was said to necessitate research not normally possible in commodity programmes. Secondly, commodity improvement research is expected to change as researchers start making use of biotechnology and draw on 'new economies of scale' (TAC 1990b:97-98).

Here, TAC deviates from its former position that resource management research, though recognized as essential for achieving sustainable production systems, can be covered sufficiently and most effectively as an integral part of commodity research:

"Past experiences suggest that in those Centres that have had both a commodity and a resource management mandate, it has been difficult to strike an effective balance between the two. Generally resource management has received less attention than crop improvement research on mandated commodities." (TAC 1991a:4)

Probably because commodity research has a longer tradition, it is easier to define than resource management research. This is one of the explanations given for "past experiences". Other contributing factors are that the impact of commodity research is more
readily recognized and, resource management research has such a long time horizon that it is difficult to define priorities.

TAC also admits that

"the greater emphasis given by Centres to crop improvement research may have been unintentionally encouraged by the 1985 TAC view that the CGIAR Centres should pursue a multidisciplinary commodity approach to research, including research on natural resources, and that solutions to factor problems requiring more basic research should be sought through collaboration with specialized institutions". (TAC 1991a:4)

Explaining why this new stand was not taken earlier, TAC says:

"The reason that TAC has opposed factor research on a disciplinary basis is the lack, historically, of a holistic perspective vital in the integration of components into appropriate technological solutions." (TAC 1991a:13)

A similar objection, however, would have been relevant for a long time in the case of commodity research.12

Drawing from these experiences, it is recognized that there is a lack of clear global responsibility for strategic research on resource management. Furthermore, the lack of genuine support for resource management research has led to uncoordinated decentralization among the Centres. This has had serious implications for commodity research. With insufficient knowledge of resource management, it has been difficult to arrive at relevant criteria for commodity improvement as well as for evaluating impact of research. Finally, an additional cause is given for establishing ecoregional entities, namely the fact that a variety of Centres conduct research relevant to the same region and the same national research systems has fostered a situation in which several CGIAR Centres have approached the same national research system, often in an uncoordinated way, thus overburdening the national research systems. This will be discussed in more detail in chapter 5.

It is hoped, therefore, that the introduction of ecoregional entities will:
* contribute to more effective resource management research
* improve coordination between IARCs and NARSs
* increase the overall cost-effectiveness of CGIAR.

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12 It should, of course, be borne in mind that membership of TAC changes over years and that differing statements do not necessarily reflect "second thoughts" but rather new eyes.
The ecoregional entities are envisaged to undertake a range of rather different functions. Based in an agro-ecological region, the ecoregional entities are supposed to collect information concerning that region, its farming systems and its resource base. The intention is that based on this information, collected in a kind of diagnostic endeavour, design criteria for commodity improvement programmes will be formulated as well as important areas for strategic resource management research will be outlined.

Related to this role, the ecoregional entities should participate in crop and tree improvement and management research by concentrating, though, on applied research. This involves a function as the major testing and evaluation sites for global Centres and responsibility for adapting new varieties and breeds to existing farming systems. Furthermore, they should host scientists from both the global commodity and subject-matter Centres.

It is suggested that the ecoregional entities have the primary responsibility for CGIAR research on resource conservation and management. This research should be primarily of strategic character.

Finally, the ecoregional entities should collaborate with national research systems and help them strengthen their capacity for undertaking research in resource management as well as providing general training opportunities.

Common to all of these quite different functions for which the ecoregional entities are supposed to cater is that they have been important elements in the criticism raised against the CG System in recent years. Thus, it is tempting to consider ecoregional entities as mechanisms for relieving the CG System's bad consciousness at the same time as freeing "traditional" commodity Centres from undertaking adaptive research, resource management research, etc. - roles for which they were not initially intended but gradually have been forced into. Moreover, it appears inconsistent to solve the problem of mixed mandates in some institutions such as IITA, CIAT, ICRISAT and ICARDA (TAC 1990b:100) by introducing new institutional entities with mandates being exactly as mixed and diverse.

The term "ecoregional" has been coined to denote regionally defined agro-ecological activities. The rationale for this approach is that it allows geographically referenced
ecological considerations to be combined with land use and socio-economic considerations (TAC 1991a:12).

There are many possible ways to divide the world into zones. Based on FAO’s agro-ecological classification, TAC has divided the developing world into 21 regional agro-ecological zones. However, TAC does not intend to establish ecoregional entities in each of these zones. Six ecoregional entities are thought to cover "the most important zones in the medium term" (See box 2.2).

**Box 2.2**
**Proposed Ecoregions to be Covered by CGIAR**

<table>
<thead>
<tr>
<th>Region</th>
<th>Agro-ecology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America</td>
<td>principally humid and subhumid warm tropics and subtropics (summer rainfall)</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>humid and subhumid warm tropics semi-arid warm tropics</td>
</tr>
<tr>
<td>West Asia &amp; North Africa</td>
<td>semi-arid subtropics (winter rainfall)</td>
</tr>
<tr>
<td>(WANA)</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td>principally semi-arid and subhumid tropics and subtropics (summer rainfall)</td>
</tr>
<tr>
<td></td>
<td>humid warm tropics and subtropics (summer rainfall)</td>
</tr>
</tbody>
</table>

Source: TAC 1990a.

Among the Centres with a global mandate, TAC distinguishes between Centres working from a commodity mandate and those having a subject matter mandate such as policy research and genetic resource conservation and management.

The global commodity Centres are expected to concentrate upon germplasm conservation, characterization, evaluation and enhancement. Furthermore, they should have in-house capacity for studying major pests, diseases and stresses that affect the productivity of the commodity. Four major groups of commodities are considered: cereals, roots & tubers,
legumes and vegetables. In addition to these, global commodity Centres are envisaged for perennial plants (trees, including coconut, banana and plantain), livestock and fish.

2.5.3 Towards a Revision of the CGIAR Mission and Goals

As already indicated, the goal statement has been subjected to continuous changes which have made it become longer and more elaborate in conjunction with increasing recognition of the complexity of the world’s food problems.

The goal statement adopted in 1986 introduced the concept of sustainability and the explicit emphasis on low-income people:

"Through international agricultural research and related activities, to contribute to increasing sustainable food production in developing countries in such a way that the nutritional level and general economic well-being of low income people are improved." (TAC 1985:26)

At the International Centres Week in 1990, a revised goal, or as it is now called, mission statement was adopted as recommended by TAC:

"Through international research and related activities, and in partnership with national research systems, to contribute to sustainable improvements in the productivity of agriculture, forestry and fisheries in developing countries in ways that enhance nutrition and well-being, especially among low-income people." (TAC 1990b:87)

This new statement signals a number of important changes. To start with the least controversial, the partnership with national research systems is explicitly emphasized as the mode of operation for the CG Centres. Though the importance of working in partnership with national research systems has been reiterated in many documents coming out of the System in recent years, adding it to the official mission statement reflects the greater importance now assigned to this aspect. Hence, rather than signalling new directions, this change confirms recent trends. Likewise, the incorporation of forestry and fisheries into the mission statement follows naturally from the recent inclusion of new research areas and centres into the CGIAR.

More controversial is the substitution of 'food production' with 'productivity of agriculture, forestry and fisheries'. The growth of the non-agricultural population and its increasing share of the total population is one of TAC’s main arguments for the necessity of this change. Food self-sufficiency achieved through food production is no longer adequate to enhance nutrition and well-being, especially among low-income people who often live in urban areas, it is said. Rather a concept of achieving food self-reliance is
suggested to guide the Centres’ research. Food self-reliance is defined as a nation’s capacity to provide sufficient stable food supply to all of its inhabitants either from domestic production or from production of exportable goods to enable commercial imports to cover the domestic deficit (TAC 1990b:84-85).

The immediate problem arising from the adoption of this new mission statement is how to demarcate the limits for CO activities. TAC recognizes this problem, though without providing any exact answers by saying:

"Although the range of commodities that are potentially in a production system is likely to be large, this does not, and should not, commit the CGIAR to working on all commodities; but it does commit the CGIAR to taking account of diverse production systems and their capacities to produce income and employment as well as marketable commodities. The direct implication is that the CGIAR should not rule out, by prior assumption, any commodity that contributes to food self-reliance either directly or indirectly." (TAC 1990b:85)

The new mission statement was presented to the CGIAR at ICW 1990 as part of TAC’s report on a possible expansion of the CGIAR. Thus, in effect, it was over-shadowed by the discussions on which centres to include. Though critical remarks reportedly were made, for instance that taken to its extreme even prostitution would become part of CGIAR’s mandate area, no comprehensive discussion was taken on its more precise implications. At ICW 1991, however, the TAC chairman, Alex McCalla, drew what can be regarded as a preliminary conclusion by saying that with a view to the financial prospects for the CG System 'new activities in forestry and fishery should not be launched at the expense of agricultural research and that the CGIAR hardly should include neither new food crops nor non-food crops such as cotton and coffee into its research mandate except to the extent that it would be necessary in farming systems research (Winkel 1991).

More fundamentally, the new mission statement makes it necessary to reconsider the rationale underlying the establishment and support for the CG System.

As earlier emphasized by TAC, the CG System has evolved from a concept of gap filling. When the CGIAR initially confined itself to research on food crops it was thus in response to the previous neglect of food crops (later also livestock production) in research carried out in or with respect to developing countries as compared to export crops which had enjoyed the attention from colonial authorities. Although the balance between research in food and export crops has been improved, partly due to the efforts of the CG System, it
is still easier to mobilize funds for research in export commodities, e.g. World Bank loans, on grounds that it is easier to justify financially than is food crop research.

TAC argues that food for the poor can be provided not only through food production but also through the production of non-food crops, etc. Had the CG System been the only actor in the global research system, it would have needed to reflect this complexity of the role of agriculture in providing national food self-reliance. Recognizing, however, as TAC does, that the CG System is only one actor in the global agricultural research system and even a minor one, the relevant issue rather is one of identifying the CG Systems' "comparative advantage" as so often emphasized by TAC, though in other contexts. As long as bilateral funds are easier mobilized for research in export crops and as long as private companies largely remain uninterested in agricultural research aimed at developing countries, particularly at the poor and the more marginal areas, the gaps which the CG System has a comparative advantage in filling remain in research aimed at food production in developing countries.
Chapter 3
THE SUSTAINABILITY PERSPECTIVE IN INTERNATIONAL AGRICULTURAL RESEARCH

While the two preceding chapters are mainly descriptive in character, this and the following two chapters discuss critically the implications for sustainability, the poverty focus and the national research systems of the changes now being made within the CG System.

3.1 Sustainability in CGIAR Centres’ Research
Two ways of strengthening the sustainability perspective of the work of CGIAR Centres are considered in the System’s reports. First, the sustainability perspective should be reflected in all research programmes, just as today most of the Centres’ research is said to be carried out within a farming system perspective. Secondly, the sustainability perspective necessitates a strengthening of specific research areas, particularly relating to resource management.

The recent inclusion of especially forestry and agro-forestry research into the CGIAR mandate area, and the recognition of the need to strengthen strategic and applied research in resource management within the CG System should, as already mentioned, be seen in this context.

Though there is no conflict between the two approaches to strengthening the sustainability perspective in CGIAR research, recent proposals to separate commodity research from research in sustainable production systems and resource management are more in line with the second approach.

Decisive for what becomes the content of such initiatives, however, is the understanding of current environmental problems - their causes and complexity as well as the possibilities that exist to deal with them. In this context, it is relevant to examine more closely the TAC report from 1988 on implications of sustainable agricultural production,
not only because it is a central document, but also because the understanding of sustainability has largely remained unchanged since then.

By being very polemic, the report (TAC 1988) paints a clear picture of the prevailing conflict concerning the introduction of the sustainability perspective into agricultural development, i.e. the conflict concerning the sustainability of the use of chemical inputs such as mineral fertilizers and pesticides. In a slightly offended tone, the report states that "... much current writing seems to imply that chemical inputs are bad, that biological inputs are good, and that small is always to be preferred. But agricultural practices are seldom inherently good, bad or appropriate. Their appropriateness is determined by the agro-ecological and socio-economic circumstances in which they are applied." (TAC 1988:5)

In the recommendation chapter, under the heading "Different Levels of Inputs", TAC recommends:

"Centres should review the emphasis given to low-input farming in their research programmes and increase it where appropriate. They should also review their approaches to research on low-input farming to ensure that the sustainability perspective is adequately taken into account." (TAC 1988:40)

This is followed by considerations about agriculture in the industrialized countries, which result in the following recommendation:

"TAC considers that, under appropriate conditions, the use of high levels of industrial inputs in production systems can make important contributions to sustainability and recommends that high-input production systems and related policy issues be included in research programmes of the CGIAR Centres." (TAC 1988:41)

This slightly offended tone is also found in reports prepared by CGIAR's Sustainability Committee chaired by Leslie Swindale, for instance, in a report made on the basis of a meeting in the Sustainability Committee held in 1989. When first introducing how CG Centres have been addressing sustainability, the report states that "... a sustainability perspective is clearly discernible in much of what the Centres do", because since the inception of the CGIAR, the Centres have shown a "... strong inclination towards low-input agriculture" (my emphasis) (Leonard, 1989:12). However, later in the report it is pointed out that:

"In short, IARC efforts to meet one priority (lowering inputs) may conflict with the priority to promote sustainability for the future." (ibid.:20)
Finally, the conclusion of the report (which as mentioned in chapter 2 is a very vague argument for status quo) is introduced in the following way:

"In an age when agricultural research is becoming increasingly politicized by use of polarizing classifications such as low-input and high-input, or chemical and organic farming...." (ibid.:26)

The direct references made to this conflict, both by the sustainability committee and in the TAC 1988 sustainability report, indicate that this is a genuine problem within the CGIAR, among its various partners as well as in the CG System's relations with the outside world. Possibly, this disagreement concerning the implications of sustainability is what has had the paralysing effect on the CG System's preparations for UNCED, to be held in Rio de Janeiro in June 1992. A decision to associate itself with UNCED was taken as late as at the mid-term meeting in Paris in 1991, and following this the CG System as such, and IBPGR as an individual Centre, have been granted observer status to the conference.

IBPGR's participation seems to be the most well prepared, while the content of the CG System's participation still seems very unprecise, except for the headings: agricultural sustainability (or sustainability of agriculture), bio-technology and capacity building (CGIAR 1991c).

The 1988 report is rather one-sided and hence manipulative in its presentation of the causes and extent of the environmental problems. One example of this is its explanation that the most important cause of environmental problems lies in the pressure being exerted on natural resources because of population growth, resulting in serious problems such as soil erosion. Malawi is given as an example of erosion resulting from small scale farmers cultivating land with an elevation of more than 12%. This is no doubt true, but there are reasons for doubting that population growth is the only factor which has led the small scale farmers to cultivate these steep slopes. The expansion of large, subsidized plantations, where, among other crops, tobacco is grown for export (curing of tobacco also requires large quantities of wood or other fuel), has required much of the more level land and therefore must be considered at least an equally important cause of erosion problems (Leach & Mearns 1988).

Secondly, use of the term "traditional agricultural system" is misleading. This term conveys the image of farming systems having remained unchanged for decades if not centuries. Traditional farming systems (understood in this traditional way) very rarely
exist, either in sub-Saharan Africa or elsewhere, since there - as well as here - improve-
ments and adjustments of farming systems are continually necessitated by changing
economic and ecological conditions of production. Of course, such processes of change
are never free of problems. In some places, farming systems break down; other places the
result is over-exploitation of natural resources; but very few places do farmers sit and
watch developments without taking any action.

In the report, the term "traditional agricultural systems" is contrasted with what is called
"open production systems". Thus, it denotes production systems which do not use
externally produced inputs to any significant degree, and which are said to be unable to
produce any marketable surplus worth mentioning. This last postulate, however, is
incorrect, since subsistence farmers have proved to have been involved in market
production for a long time.

The contrasting of 'traditional' with 'open' agricultural systems is important, because it
gives the impression that the only possibility for achieving increased marketed production
is by transforming 'traditional' agricultural systems to 'open' (input using) agricultural
systems. In this context, the 'traditional' agricultural systems are said to contain the
possibility for only 1% increase in production per area unit per year, which is of course
insufficient compared to a typical population growth of 3%. The basis for this postulate
is weak, however. Reference is made to a study of traditional cattle keeping systems in
eastern Botswana which cannot be considered valid for generalization, and further to a
more general summary of yield tendencies in various regions of the world from 1954-1973
based on FAO's agricultural production statistics. These figures show that agricultural
production in regions with an average yield per hectare of less than 1700 kg only rose 1%
per year, while production in regions with a yield per hectare greater than 1700 kg rose
4.5% per year (de Wit, van Laar & van Keulen 1979:49-52).

Many reservations can be made about the use of such studies in relation to assessing
possibilities for production increases from 'traditional production systems'. The first
reservation relates to the character of the data on which the FAO study is based. FAO's
statistics for agricultural production are, in most cases, not based on exact measures but
rather on estimates which, at best, are made on the basis of agricultural extension workers'
knowledge about the farmers. These estimates have often proved to be wrong, and
especially concerning 'traditional' producers, the extension workers' knowledge is seldom good (Raikes 1988:17-23).

Another critical point is that no evidence is presented to show that the limit of 1% increase in productivity claimed by the study is physically or biologically determined. It is rather unlikely that it should not be possible to increase yields from e.g. 1000 kg to 1100 kg (10%) per year without use of chemical fertilizer but rather, for example, through better weeding or pest management. Finally, an eventual lack of productivity increase can just as well - or perhaps more likely - be due to the fact that no need has existed, for example that it has been possible and more attractive to increase production by increasing the area under cultivation. Such a strategy, of course, cannot continue into a period when arable land is becoming a limited resource. In other words, there is a clear lack of understanding of the dynamics underlying changes in the so-called 'traditional' agricultural systems.

3.2 Strengthening Resource Management within the CG System

Following much debate, there now seems to be agreement that strengthening the sustainability perspective puts research in resource management on the agenda. Both strategic and applied resource management research is needed to provide knowledge on which to base development of sustainable production systems. The question remains, however, what the content of such research shall be.

In the definition of sustainable agricultural production in the 1988 sustainability report, TAC distinguishes between "resources manufactured outside the agricultural sector" (i.e. agricultural chemicals and machines) and "natural resources". In the definition, use of the manufactured resources should be developed, while the natural resources should be conserved (TAC 1988:2-3). This suggests that it is in the produced resources that sources for growth should be sought and not in natural resources. Thus, natural resources need not be 'managed' but merely 'conserved' to maintain the basis for production, and not least, the basis for increased use of manufactured resources.

The 1985 TAC report's recommendation to strengthen research in conservation of plant genetic resources - which form the basis for further development of improved varieties, making increased use of inputs possible - under the programme area "research in resource management and conservation" - can also be taken as an expression of this view.
Research in soil conservation, in management and conservation of water resources (not only in respect to irrigation), in agricultural use of energy and in characterization of agro-ecological zones in order to determine their production potential - none of these research areas were recommended to be strengthened within the CG System, but were referred to institutions outside CGIAR.

Given the CG System’s perception of the Centres as playing the role of gap fillers to satisfy unmet needs in agricultural research, this recommendation is hard to comprehend - then as well as now. An area such as research in methods of soil fertility conservation without use of chemical fertilizers is not particularly well researched compared with conservation of soil fertility through use of mineral fertilizers. Thus, in 1984 and 1985 IFDC had an annual budget of 10 mio. US$ (IFDC 1986) or approximately 5% of the CG System’s total budget (!), while no similar international centre can be pointed out that carries out soil productivity research without the use of mineral fertilizers. In addition, major parts of the work of both the CGIAR Centres and the national research centres relate to the use of mineral fertilizers.

Based on such reflections and under impression from the work of the Sustainability Committee that prospects for changes in the Centres’ research programmes were limited, the recommendation not to strengthen research of e.g. soil and water resources as independent research areas was challenged from several sides. The question was posed directly in relation to the discussions which took place at the 1989 mid-term meeting in Canberra, and was a decisive factor in initiating the review of non-associated centres for possible inclusion into CGIAR.

However, there has been and still is considerable reluctance to fully recognize certain types of resource management research as independent research areas within the CG System. As in almost any other context where environmental issues are discussed, environmental concerns are divided into at least two groups: For one group, the 'conservationists', conservation of the species, nature, forests, diversity per se is the primary concern; for the second group, the 'environmentalists' who focus on the relation between human production and natural resources, both as cause and solution to environmental problems, the concern is rather to ensure sound utilization of natural resources. Thus, by including forestry research as an independent area of research, as well as by strengthening the focus on plant genetic resources, the discussion of a possible
expansion of the CGIAR has, in effect, divided the critics into two groups, primarily satisfying the 'conservationists'. This is evident from the summary of ICW 1990, quoted in chapter 2.

Strategic research relating to the utilization of natural resources, such as research in soil/plant/water relationships or relating to biological pest management as independent areas of research, on the other hand, faces an uncertain future.

In TAC's 1988 sustainability report, it was recommended that instead of giving higher priority to the majority of areas lying within resource management research as independent research areas, these aspects should rather be included in the commodity-specific research.

Although it has been recognized since then that there is a need and place for strategic resource management research within the CGIAR, at least officially, it has been recommended not to assign it status as a research area for specific Centres, but to include it as part of the eco-regional entities' responsibility within the overall aim of developing sustainable production systems (TAC 1991a). Hence, there are great similarities with the recommendation given in 1988. The only difference is that now commodity improvement, or rather plant breeding, as a discipline, has been removed from the multi-disciplinary teams and assigned its own global commodity Centres. The lack of concrete proposals as to how strategic resource management research should be conducted is conspicuous: Should all eco-regional entities deal with all resources or should responsibility for specific resources/areas of research be divided among the entities? Should strategic resource management research be conducted separately from applied research? How much financial resources should be allocated to this type of research? How should strategic resource management research relate to global commodity Centres, and to similar research conducted outside CGIAR? Taught by the lessons of former experience, this uncertainty is alarming.
4.1 The CGIAR Goal: Alleviating Poverty or Inequity?

Improvement of the living conditions of the poor has long been a formulated objective for the CG System. This was, for example, the reason why the CG Centres embarked on farming systems research in the 1970s and commissioned studies of the individual centres' efforts in this area of research - just as is done today in relation to the sustainability perspective.

At that time, priority was given to farming system research as a response to the criticism made of the Centres and their impact through the green revolution. The critics maintained that the living conditions of the poor had been worsened, while farmers who were already better off were those benefitting from the new technology (e.g. Griffen 1974).

Even though this criticism has since been modified by further studies (e.g. Blyn 1983), it has had the effect of at least a formal focus in agricultural research on developing technologies relevant for resource-poor farmers. This objective appears in many contexts within the CG System, including the System's mission statement.

In the CGIAR reports already discussed, however, also another objective is formulated, i.e. that international agricultural research should contribute to increased equity among farmers in regard to access to and distribution of resources.

These two objectives have different implications for agricultural research. The upper limit determining who is poor, and therefore who belongs to the group for whom research results should be relevant, are to some extent arbitrary. Thus, in a report issued by IFPRI, all Africa's small scale farmers are identified as poor and thus the potential target group for the CGIAR Centres' work (Oram 1988a:25). If the objective of the research is rather to increase equity among farmers, then the Centres must direct their research more
explicitly not only to 'the poor' but to 'the poorest' to improve their opportunities to increase production relative to more advantaged farmers.

In addition to emphasizing 'low-income groups' in the CG System's mission statement, the TAC Review of 1985 treats the poverty perspective exclusively as a question of which commodities should be researched. One of the criteria on which the strategic plan is based is thus each commodity's relevance for the target group. The description of these criteria is introduced by stating that "all the commodities researched by the CGIAR Centres are relevant for the low-income group, since they comprise their basic foods" (TAC 1985:app.2-4). The report goes on to state that thereafter the equity aspect can be taken into consideration, i.e. each commodity’s relative importance in relation to specific target groups (such as producers in relation to consumers, rural dwellers in relation to city dwellers, women and children in relation to men) as well as which commodities are especially important for the very poor and the undernourished (ibid.).

Examples are then presented for various indicators that can be used to determine which commodities are most relevant, in relation to income and employment generation and in relation to improvement of nutrition. These include the amount of work required in cultivation of each commodity, the percentage of poor and undernourished in the total population, and commodities’ relative significance - all calculated by geographical region (ibid., tables 2, 5-9, 24).

Several comments can be made to this way of treating the poverty and equity aspects in agricultural research. The first problem which is overlooked is how to formulate a research strategy that will benefit a certain percentage of the population of West Africa identified to depend on cassava. Merely knowing the proportion of the population depending on cassava is an insufficient basis for drawing the conclusion that improvement of specific characteristics such as yield or nutritional value would be the optimal research strategy. The identified group of farmers would perhaps prefer to plant maize if it were possible for them to meet soil and labour requirements. In that case, more maize research would be needed. Another possibility could be that improvement of cassava would make it attractive for more advantaged farmers or even for commercial agriculture, which could lead the original target group into increased relative, as well as absolute, poverty.
Finally, choice of farming system or cultivation method is not treated at all in the description of the criterion for relevance for the target group. This, of course, is somewhat puzzling, since it has often been reported that lack of access to necessary marketed inputs such as fertilizers and pesticides has prevented resource-poor farmers from benefitting from the results of agricultural research.

In the TAC sustainability report from 1988, the equity perspective in research is discussed under the heading "Sustainability and Equity". This section begins by refuting the criticism that the green revolution had made poor farmers poorer. The green revolution has benefitted the poor through lower food prices (changes in the poor's wages are not taken into consideration), and even though wealthier farmers had been the first to use the new technology, farmers who were not so advantaged have also adopted it. The new technology is, so it is said, 'scale neutral'. Thus, the argument is made from a poverty perspective, and not with the objective of contributing to increased equity, even though the section heading indicates otherwise. Rather, it is stated, differentiation has taken place among the population in agro-ecologically favoured and unfavoured areas. The same tendency is assumed to apply in other parts of the world. The conclusion, therefore, is that if agricultural research wishes to contribute to greater equity, an effort must be made to improve productivity in the areas that, from an agro-ecological point of view, are more marginal.

The question of equity - or rather inequity - is hereby made a phenomenon dependent on agro-ecological features. As a result, social and economic differentiation among farmers within a single area, sharing the same (favourable) agro-ecological conditions, is overlooked. The same reasoning can be found elsewhere, e.g. in the report, Modern Varieties, International Agricultural Research, and the Poor, prepared in connection with the impact assessment of the CG Systems's efforts (Lipton 1985:26).

Though not explicitly emphasized, the analysis included in the 1991 TAC review of priorities and strategies (TAC 1991c) "refutes" the argument that poverty and inequity are agro-ecologically determined. The 1991 TAC Review contains a highly interesting analysis based partly on a study carried out by IFPRI (Broca & Oram 1991), partly on World Bank estimates of the location of the poor according to agro-ecological zones and geographic regions. From this, it appears that the percentage of the total population which is poor is fairly uniform across agro-ecological zones, varying from approximately 25% in the "wet
zone" to 39% in the "seasonally dry" zone. Thus, also in the parts of India where the green revolution has taken place, the percentage of the population living in poverty is between 30 and 40% (Broca & Oram 1991:23).

This ought to re-emphasize the concern with equity, i.e. the specific focus on developing technologies for the poorest, as an issue on the research agenda, not only in so-called marginal areas, but also in areas regarded as having a high potential.

What further distinguishes the 1991 TAC Review from former reports is the importance assigned to the non-agriculturally employed poor. A large proportion of the poor, it is argued, live in urban areas making their living from activities other than farming. As this proportion is expected to increase, it poses the challenge of increasing productivity in order to create surpluses of cheap food to supply the urban poor. As in other aspects relating to the poor, exact figures on urbanization and urban versus rural poverty are lacking. The figures available, however, suggest that the proportion of the population living in urban areas, surprisingly, is the same in Asia and sub-Saharan Africa (12-15%), while in Latin America the proportion is 44%. However, the share of the population comprised by non-agriculturally employed rural dwellers should also be considered in this context. If added to the urban population, the total non-agricultural population is 43% in South East Asia, 29% in South Asia, 26% in sub-Saharan Africa and 69% in Latin America (Broca & Oram 1991).

However, it is in Asia that urbanization is expected to create the greatest problems and thus pose challenges for agricultural research, since it is in this region that the so-called yield gap or scope for growth with presently known technologies is smallest (0.6 as compared to 0.82 for sub-Saharan Africa; 0.79 for Latin America and 0.72 for West Asia and North Africa) (TAC 1991c:139). The yield gap is calculated by comparing the potential productivity of presently cultivated land with the present annual food crop production. Thus, the argument is that where the yield gap is small, efforts in strategic research are needed to increase stable biological yields of crops, i.e. the potential productivity, and thereby broaden the yield gap. So far, the argument seems plausible. However, the argument is also made the other way around, saying that the high yield gap for sub-Saharan Africa indicates the existence of many opportunities to obtain improvements in crop productivity through application of technology resulting from applied and adaptive research (TAC 1991c:140). In this case, the conclusion to be drawn could just
as well be that the technologies which are the basis for calculating the potential productivity are inappropriate, if not from a biological then from a social or economic point of view, since they apparently have not been adopted.

Like the former reports, the 1991 TAC review does not treat the question of choice of cultivation techniques and farming systems in relation to the research's poverty orientation in any detail. Moreover, the socio-economic dimension is absent in TAC's proposals on how to organize research in developing sustainable production systems. The development of sustainable production systems, which is envisaged as one of the responsibilities of the ecoregional entities, is proposed to take place according to "research domains". As defined by TAC, "research domains" only encompass a geographical and agro-ecological dimension. Thus, the assumption is that all farmers within a research domain, regardless of their access to resources, are likely to benefit from the same technologies and production systems - an assumption which farming system research has shown rarely holds true. Thus, there is only little hope that attention will be directed to the relationship between choice of production system and concern with the poor(est).

It is Peter Oram who, in the 1988 IFPRI report, provides the most comprehensive presentation of the questions of poverty and equity perspectives.

"A further important policy issue which should be considered is how to promote equity through growth linkages where resources for production are unevenly distributed, and particularly how to safeguard the interests of the poorest of the poor." (Oram 1988:27)

The question, however, remains unanswered.

Unlike the 1985 TAC report, Peter Oram points out that the choices of both which commodities and which cultivation methods should be researched are essential in light of the objective to contribute to increased equity. An important element in these considerations is deeper insight into the farmers' motivations for use or non-use of specific technologies (Oram 1988:42).

The strategies presented in the IFPRI report have been developed on the basis of a list of criteria. Even though the importance of equity, and not only poverty orientation is emphasized several times in the report of the research, it is the seventeenth of twenty criteria:
"...the Centres should avoid actions which might discriminate against vulnerable social groups - tenants as opposed to landowners, women members of farm families, and landless persons. Loss of rights of access to common resources should not be threatened, since these are often a main source of support for disadvantaged people. Technologies which are neutral to farm size and gender may be preferable to those which are skewed too narrowly to target groups." (Oram 1988:54)

It is striking that the formulations about the poverty orientation of research and efforts to contribute to increased equity among various social groups is so unprecise as is the case here, especially since these aspects have been accepted a long time ago as essential objectives of the CO System's activities. Thus, there is a great need for more detailed clarifications, although, to judge from the various TAC reports, there seems to be little promise of them being forthcoming.

The first clarification needed concerns the extent to which the CO System in its research strives only to achieve absolute improvement of the poor's living conditions or to contribute to both an absolute and relative improvement.

Secondly, it is necessary to develop a more detailed set of criteria in order to be able to define and assign priorities among research programmes. As discussed earlier, it is not sufficient to define these criteria so that they can be used for choosing among commodities to be researched. In addition, such criteria should guide choices between various cultivation methods. This of course demands knowledge of the poor's access to resources and their preferences, which go beyond their dependence on various commodities. On this point, international - as well as national - agricultural research institutions have proved to be weak (Oram 1988b: 16) in spite of various types of farming system research activities.

Finally, there is reason to be watchful of the tendency, that has been strengthened after the introduction of the sustainability aspect, to consider poverty as an agro-ecologically determined phenomenon and thereby overlook the social and economic forces.

It is not only in the reports referred to thus far, which treat the CO System in general, that this tendency can be found. IITA's plan for the period 1989-1993 also states that "IITA's research strategy is explicit in allocating significant resources for work relevant to the problem of farmers in less endowed regions" (IITA 1988:7).
Even though it is desirable to allocate more resources for increasing productivity in less-endowed regions, for thereby to improve the poor's living conditions from a social as well as an environmental point of view, the consequence must not be that poverty in the agro-ecologically advantaged regions is overlooked. If that should happen, it could mean a further worsening of this group of poor's possibilities to undertake productive and competitive farming. Moreover, this tendency to overlook the social and economic forces that influence poverty and (in)equity in society leads to static ways of thinking. Thus, it becomes impossible to predict whether a technological development that e.g. increases the productive potential of formerly marginal areas would initiate a process of economic differentiation.

Even though the statistics on the location of the poor presented in the 1991 TAC Review do not support the argument of poverty being an agro-ecologically determined phenomenon, there seems to be little prospect for more research dealing explicitly with poverty and inequity in relation to choice of agricultural technology.
CHAPTER 5
NATIONAL AND INTERNATIONAL AGRICULTURAL RESEARCH

5.1 Weak National Research Systems - a recent concern

Recently, "in partnership with national research systems" has been made part of CGIAR’s mission statement. In spite of this,

"... there is no comprehensive statement of CGIAR policy on the relationship between CGIAR Centres and national research systems in the developing countries." (TAC 1991b:2)

Nor have any "earlier documents ... penetrated deeply into such questions as the extent to which Centres should or should not become involved in measures designed to strengthen national research systems" (ibid.), thereby enabling these to participate in and gain from 'the partnership with CG Centres'.

Thus, TAC’s paper entitled Relationships between CGIAR Centres and National Research Systems. Issues and Options, prepared for the 1991 mid-term meeting in Paris is the first paper dealing explicitly with these issues.14

Over the past decade, the relationship with national research systems has developed from being if not a neglected then a largely unreflected aspect of CGIAR activities, into an aspect receiving considerable attention.

ISNAR’s establishment in 1979 was among the first signs of the evolving concern with the many weak national research systems in developing countries.

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14 This, however, is a qualified truth. As part of the often overlooked CGIAR Impact Study (Anderson 1985 and the background papers published in the CGIAR Study Paper Series), finalized in 1985, a study was undertaken on the collaboration between the international and national research systems (Jahnke et al. 1987). The study raises many of the same questions as those discussed today. Recognizing the specific research needs of sub-Saharan Africa combined with the weakness of many national research systems in this region, the report states: "The question, then, is whether international agricultural research should fill this downstream gap [adaptive research] itself or whether one should concentrate on strengthening NAR [national agricultural research] in tropical Africa" (Jahnke et al. 1987:27). It continues: "But the CG System is an open system, free to choose, accentuate and change its priorities for different activities over time. It is up to the international donor community to decide..." (ibid.:37). This choice has not yet been taken.
"Because International Centres depend on national programmes for their ultimate success, the CGIAR has created ISNAR to help strengthen national programmes." (CGIAR 1981:44)

The 1985 TAC Review reaffirmed the importance assigned to strengthening national research systems, though without elaborating further on the issue as such, nor on the measures by which this should be achieved. Strengthening national systems was primarily seen to be achieved through training of national researchers, provisions for conferences, seminars and workshops and finally through documentation and information dissemination services. Resources allocated for institutional development, which is ISNAR’s mandate area, have only constituted a minor, though increasing proportion of total resource allocation for strengthening national research systems. In 1985, resources allocated to ISNAR amounted to 14% of total resources allocated to strengthening national systems while in 1990, the share had risen to 18% (CGIAR Annual Reports & CGIAR 1991b).

Since then, and in large part due to ISNAR’s studies of national research systems, recognition has gradually emerged that low level of training is far from the only factor responsible for the "weakness" of many national systems. Many national research systems are small, e.g. in terms of number of researchers, have a relatively short history, but nevertheless have witnessed frequent reorganizations due to internal changes as well as donor recommendations. This implies that each researcher has to perform a variety of tasks, often in relative isolation and under poor working conditions, that overall planning and priority procedures are weak and/or distorted, making coordination, discussion among researchers etc. difficult.

This growing understanding presently awaits being transformed into novel approaches for strengthening national research systems. Until these evolve, the reality remains that many national systems are too weak to benefit from research carried out by the CG Centres, i.e. to absorb, combine and adapt research results coming from the Centres in order to develop technical solutions useful under their specific conditions.

Three options - substitution, by-passing or strengthening national research systems - can be thought of to deal with this situation of prolonged weakness of many national research systems, and have to various extents been employed by the CG Centres. Many CG Centres have over the years chosen to move into what is ideally considered the domain of national research systems, i.e. to undertake location-specific adaptive research. This tendency,
which in TAC documents is referred to as 'uncoordinated decentralization' of CGIAR activities, is, in effect, employing the option of substituting (rather than strengthening) national research systems. A second option for overcoming the problems would be for CG Centres to focus on technical solutions which need no further adaptation and thus make it possible to by-pass (rather than working "in partnership" with) the national research systems.

The successful research carried out jointly by IITA and CIAT to alleviate the problems caused by the fast spread of cassava mealy bug in sub-Saharan Africa serves as an unintended and therefore ironic illustration of this. By identifying a natural enemy of cassava mealy bug, the wasp *Epidinocarsis lopesi*, and developing a method for mass-rearing of this wasp, it had by 1990 been possible to establish the wasp in 25 African countries, making it likely that cassava mealy bug soon will become a problem of the past. According to IITA, one of the important ingredients making this research a success story was that participation of tens of thousands of extension agents was not needed; they did not even have to be aware of the problem. Nor was any investment, maintenance or other action by farmers called for and, finally, the problem of the presence of cassava mealy bug is apparently the same whether cassava is grown in Nigeria or Tanzania. The wasps are simply released from aeroplanes or from the ground and once released they reproduce and disperse themselves.

Only very few agricultural problems, however, are of a nature which makes the option of by-passing national research systems feasible. In other words, the third option for dealing with the weak state of many national research systems, i.e. to strengthen them, is necessary and the only viable recourse. This is discussed in more detail below.

5.2 The Need for Strong National Research Systems

In 1990, TAC described "the evolution of scientific capacity in the developing countries" as "a factor of paramount importance" (TAC 1990b:45) and it continued:

"The international community acknowledges national research systems as the foundation of a global system, serviced by the supranational levels." (ibid.)

Although more recently ideas have been put forth that suggest the "supranational rationalization of research" as "the logical goal involving savings for the partner nations" (TAC 1991c:17), the above recognition of national systems still holds true.
The case of research on cassava mealy bug is thus a unique case in that national adaptive research was not needed. Only very few agricultural problems are identical for Nigerian and Tanzanian farmers. Usually, they differ with soil types, day lengths, rainfall patterns, availability of land, labour and capital, marketing systems and national policies. Correspondingly, only very few technical solutions are equally appropriate for Nigerian and Tanzanian farmers. As a minimum, they need to be adapted to local conditions, but often adaptations are not sufficient, and distinctly different solutions are called for.

Moreover, only very few technical solutions have wings enabling them to spread themselves. Once technical solutions are identified, farmers need to be made aware and convinced of their desirability and efficiency. In other words, research results have to be communicated, explained and demonstrated to become effective. Therefore, research needs to be linked with the wider administrative structure, particularly, of course, the extension service. Invariably, agricultural, livestock and forestry extension services are organized along national administrative boundaries, and this is one reason why the national level is often the most appropriate when organizing research.

A further argument for the appropriateness of research at the national level (as opposed to e.g. the regional level) relates to the role of agricultural research as a factor of competition. Having strong national research systems is one of the factors making the agricultural sector of one country more competitive than that of its neighbour. This, of course, limits incentives for e.g. mutual regional research cooperation (Jha 1987:271).

Finally, seen from the point of view of the CG Centres, strong national research systems are essential not only to adapt results from CGIAR research but also to identify problems for which international research is needed. This recognition is of relatively recent date and is perhaps not yet implemented to its full extent. Thus, what the recent TAC Issues & Options paper (TAC 1991b) emphasizes for cooperative networks among national research systems and CG Centres could as well be extended to apply to the overall relationship between national research systems and the CG System:

"As far as cooperative networks are concerned, if they are to be successful and sustainable, there is no viable alternative to a demand-driven system in which the countries themselves define the problems and determine the priorities." (TAC 1991b:13)
5.3 CGIAR's Future Role in Strengthening National Research Systems - a controversy

Despite the wide agreement on the importance of the CG System's relationship to national research systems, conflicting views exist within CGIAR about its proper role and contribution in strengthening this relationship.

Viewed in this context, the formulation in the mission statement represents the least radical position, since "in partnership with national research systems" is conceived merely as the mode of operation for the CG Centres. Thus, the Centres should only involve themselves in providing research assistance to national systems, in so far as it is necessary to fulfil the Centres' own research mandates. The governing principle is that CG Centres should primarily be seen as research institutions. This is TAC's position, but a number of donors would indeed like to see CG Centres involve themselves more extensively in administering research assistance to national research systems in order to strengthen these.

"While TAC has frequently advocated regarding the Centres primarily as research institutions, only the donors can decide their future." (TAC 1991b:11).

The position of donors is partly based on the difficulties many bilateral donors find in identifying projects to support national research systems and in administering the often small grants which are needed, just as this type of project is seldom requested by recipient countries. Moreover, the Centres are considered better qualified to provide research assistance to national systems due to their being placed in a research environment which facilitates recruitment of personnel for technical assistance, appraisal and evaluation of research activities etc.

As revealed in the quotation above, the conflicting views are openly recognized, both by TAC and in the CGIAR. The issue was discussed both at the mid-term meeting and at ICW in 1991, and it is hoped a final agreement will be reached at the 1992 mid-term meeting to be held in Istanbul.

In spite of the position taken by TAC, a door is held open for a compromise. In its document on a possible expansion of the CGIAR from 1990 (TAC 1990b) and again in the 1991 priority and strategy paper (TAC 1991c), TAC has suggested that technical and financial assistance for in-country applied and adaptive research, often through bilateral programmes, can be justified by current lack of capacity in developing countries as acceptable CGIAR activities over the medium term (TAC 1990b:44).
Regardless of how the conflict is resolved, the new ecoregional entities will become part of the solution since they are envisaged as lead Centres for CGIAR collaboration with national systems, and

"if the CGIAR wishes some of its Centres to become more explicitly involved in research assistance, those with ecoregional mandates would be prime candidates for assuming this role." (TAC 1991b:14)

Hence, it becomes important to examine more closely the roles envisaged for the ecoregional entities in order to assess their possible impact on the national research systems.

5.3.1 The role of ecoregional entities

In the context of national research systems, the ecoregional entities are thought of in general terms as coordinating bodies between global Centres and the national systems, as well as among national systems, by facilitating networking activities etc.

More specifically, however, the following three functions are envisaged for the ecoregional entities: First, the ecoregional entities are to be major testing and evaluation sites for CG Centres, with global (commodity) mandates. Secondly and in continuation of this, ecoregional entities will have responsibility for adapting new varieties and breeds to existing farming systems. Finally, ecoregional entities are to play a central role in formulating "design criteria" for commodity improvement and strategic and applied resource management research.

Hitherto, all of these functions have been - and still are - regarded as the responsibility of national research systems. The extent to which ecoregional entities should coordinate/participate in these functions should be determined by the strength of the national research systems.

"Ideally, NARS will do all adaptive research and much of the applied research.... Where national systems are weak, a case could be made for the ecoregional entity to take research through all three levels [adaptive, applied and strategic], including on-farm research at a few locations in the region; a case could also be made for the ecoregional entities in such areas to be a Centre, on the past CGIAR model, in order to help NARS more effectively." (TAC 1991a:17)

Though it is emphasized that adaptive research should primarily be undertaken to develop methodology and provide an example of how to do it (TAC 1991a:6), this proposal requires careful consideration. While TAC strongly argues in favour of maintaining the
principle of CG Centres primarily being research institutions, it is willing to give in on another CGIAR principle, namely that CG Centres should be primarily responsible for conducting strategic and applied research. In other words, and put more crudely, TAC prefers to see CG Centres (ecoregional entities) take over the function of adaptive research rather than enable national systems to perform this function by providing them research assistance. Underlying TAC's position, of course, is a concern about ensuring the maximum effectiveness of CGIAR research; this probably is what "effectively" in the above quotation refer to.

Adopting this recommendation, however, entails a danger that, instead of strengthening weak national research systems, the ecoregional entities will either substitute (or duplicate) these or function as yet another link placed in between CG Centres and the national systems.

There are some problems connected with the three functions being considered for the ecoregional entities discussed above. While the IARCs have served as testing and evaluation sites for each other due to being placed in different ecoregions, the national research systems have also carried out this function for the CG Centres and their various programmes. The remarks made about CG Centres approaching national research systems in an often uncoordinated manner, overburdening them with trials etc. are descriptive of this situation. The establishment of ecoregional entities, however, would not eliminate the need for variety testing and evaluation trials presently taking place in collaboration with national programmes; nor is this the intention. The hope is rather that the ecoregional entities will play a role in coordinating contacts between global Centres on the one hand and the national research systems within each ecoregion on the other.

For many, particularly small countries which can easily be referred to a specific ecoregion, this is likely to have positive impact. However, for countries with diverse ecological conditions, the benefit is more doubtful since they will need to maintain links with more ecoregional entities. Furthermore, the fact is overlooked that in most countries, research is organized along commodity rather than agro-ecological lines. Thus, problems of incompatibility are likely to occur between the CG ecoregional structure and that of the national research systems. In such situations, national researchers may be more interested in maintaining links with global commodity Centres rather than (or parallel with) ecoregional entity(ies).
Poor coordination among IARCs when approaching national systems is, however, not the sole factor preventing fruitful and mutually beneficial relations between IARCs and national research systems from emerging. The problem persists that variety testing and evaluation trials have tended to be defined by CG Centres alone without collaborating with national programmes working on the relevant commodity. This fosters a situation in which participation in such trials is perceived by national researchers as an additional burden rather than as an activity complementing and thus enhancing their own research. Therefore, without considering alternative ways of planning such activities in collaboration with national programmes, improved coordination is insufficient to ease the burden presently placed on national researchers and thus to improve conditions for mutual collaboration.

The second and third functions for which ecoregional entities are assigned responsibility are as stated above to adapt new varieties to existing farming systems and to formulate "design criteria" for commodity improvement as well as resource management research. The idea is that they be carried out and/or coordinated by multi-disciplinary teams of 8-10 scientists. As described earlier, each ecoregion is suggested divided into 3-5 smaller priority zones, referred to as research domains. For each of these research domains, the multi-disciplinary teams of scientists are given to describe the resource base and the farming systems, creating a data base which can be drawn upon by other scientists.

The approach is questionable for a number of reasons. First of all, it is doubtful whether an ecoregional entity in actual fact will be able to improve the understanding of location-specific conditions which is necessary, e.g. to formulate design and evaluation criteria. Secondly, in spite of being weak, most national systems have gained experience in these fields of research which deserve being further developed rather than ignored.

No matter how carefully the research domains are defined, they will end up being large. This will, in the first place, make it difficult to cover them satisfactorily and thus to make meaningful generalizations guiding further research. Secondly, if farming systems are to be comprehensively understood, if varieties are to be fitted in successfully, and if design and evaluation criteria are to be formulated, it is necessary to consider not only agro-ecological but also socio-economic factors. This does not only apply to commodity research but also when focus is on resource management. For this reason, within FSR
where the notion of 'research domain'\textsuperscript{15} is primarily used, it entails a socio-economic dimension. Hence, it refers to a group of farmers, operating under similar agro-ecological and socio-economic conditions who are therefore also likely to benefit from the same type of technical innovations. When the socio-economic dimension is omitted in the present context of sub-dividing the six ecoregions into minor zones, it is for the obvious reason that it would multiply significantly both the complexity and the number of research domains to be established. However, omitting this dimension entails a danger that it becomes difficult or even unlikely that the poverty focus, which is supposed to be reflected in all research, will be kept in mind, since in the "default" position it is always the resource-poor groups and their needs which are neglected.

5.4 Alternatives for Strengthening National Research Systems

The need for coordination of CGIAR activities in and with national research systems is beyond doubt. Nor can the need to assist national systems in strengthening their research capability be questioned. Financial and technical assistance are important components in pursuing these goals.

Being placed in a region, ecoregional entities are indeed one institutional option for improving coordination as well as for providing research assistance. However, there are indications that this might not be the optimal option.

It should be remembered that ecoregional entities are primarily intended as the institutional mechanism for carrying out research in resource management and sustainable production systems. This is a substantially different task from that of being a coordinating body and providing research assistance. Thus, as also pointed out by TAC, there is a danger that:

"Instead of responding to demand, there is a temptation for Centres to promote their own areas of research, and for countries to look upon the Centres as donor agencies, rather than as research institutions." (my emphasis) (TAC 1991b:11)\textsuperscript{16}

Furthermore, the proposal to separate global commodity research from the more location-specific research in resource management and sustainable systems is made in an attempt

\textsuperscript{15} In FSR, the term most frequently used is 'recommendation domain'. However, the basic idea of identifying a unit (group of farmers, area) for which a given recommendation (or research) is potentially relevant is the same.

\textsuperscript{16} In this quotation, the term Centres also seems to encompass the ecoregional entities.
to resolve the situation of Centres such as CIAT, IITA, ICRISAT and ICARDA which have suffered from having mixed mandates (TAC 1990b:100). Thus, in this context, it seems inconsistent at the same time to create entities or even new centres likely to experience exactly the same problem.

Concerning the second kind of activities envisaged for ecoregional entities, i.e. to "fill the gap" in adaptive research where national systems are too weak to perform this function, more profound objections should be raised.

First of all, it seems unlikely that ecoregional entities with teams of 8-10 scientists would be able to achieve results which in terms of quality (in-depth location-specific understanding) and quantity (coverage of many diverse locations) would exceed those of national teams of scientists if they were provided overall supervision and improved working conditions.

Furthermore, there are weighty reasons for reconsidering the proposals of assigning ecoregional entities responsibility for coordination and adaptive research, since there is an overhanging danger of substituting or (in the perception of national researchers) duplicating research previously or presently conducted by national researchers. This could have negative impacts on collaboration with and efforts to strengthen national systems. In this process, attention should be given to actually identifying what is needed to strengthen national research systems as such, rather than the more limited approach of merely trying to identify mechanisms for making CGIAR research effective.

Instead of the ecoregional entities, alternative mechanisms should be found for identifying, coordinating and providing the needed research assistance as well as for coordinating the overall contacts between global Centres and national research systems.

Two options seem viable, possibly in combination. In many regions, research networks of national systems and/or programmes, such as SACCAR, already exist. Some of these are well-functioning and are thus candidates as coordinating bodies, possibly with the provision of additional technical and financial assistance. The current SPAAR initiatives to create what are called consolidated funding mechanisms are highly interesting in this context. Recognizing national research systems as the building blocks for any higher level of collaboration (regional or international), the consolidated funding mechanisms will be
country specific with the aim of strengthening national research systems. An important element will be the provision for not only capital but also recurrent funds. Though the consolidated funding mechanisms are country specific, they are seen in a regional context. Thus, SPAAR has prepared *Framework for Action* documents for the Sahel and the Southern African regions in which the regional institutions INSAH and SACCAR should carry out the functions of orientation and coordination.

Secondly, one of the CG Centres, namely ISNAR, which receives remarkably little attention in this context, has as part of its mandate to put national systems in touch with donors, and to help link CG Centres more closely with national research systems (TAC 1991b:14). ISNAR, furthermore, has the advantage of being known in national systems as a service rather than research institution. Thus, the second option would be to establish regional ISNAR sub-centres or sub-services as the institutional mechanism for coordination as well as for administering research assistance. Such regional ISNARs would either perform these functions themselves or act as supervisors to existing regional networks.

However, the formulation of comprehensive research strategies and programmes and of procedures for setting and adjusting priorities is a precondition for any of the above mentioned initiatives to strengthen coordination and to provide and administer research assistance. This remains an issue where neither national research systems in developing countries, nor donor organizations or the CG System have long-standing traditions. Recognizing the importance of this issue, however, was another reason for establishing ISNAR and over recent years ISNAR has gained important experiences in this field. Hence, this is a further argument for involving ISNAR in regionally based initiatives to strengthen national research systems.
6.1 Prospects for Genuine Changes in the CGIAR

The CG System is apparently in a process of transition. New centres have been adopted; new areas of research - forestry and fisheries - have been included into the CGIAR mandate; the mission statement has been revised and new institutional mechanisms launched. However, there are reasons to consider whether these changes are genuine: Will a substantially altered CG System, not only in terms of appearance but also in terms of content - the research it undertakes - emerge as a result?

Unfortunately, a number of indicators suggest that the changes are primarily taking place in the surface.

The process relating to the expansion of the CGIAR is one example. Early in the process, donors emphasized that they did not wish the review of the ten non-associated centres being considered for possible inclusion to be simply a matter of 'inclusion-or-not' of new centres and areas of research. Rather, they would like to see the review to identify the needs for qualitative transformation of the CG System. Thus, the review should examine the entire CG System in a global context, making the necessary recommendations concerning a (re)distribution of resources among "old" and "new" Centres as well as among "old" and "new" research programmes.

So far, almost the only discernible results of the review are the expansion of the CGIAR with four Centres and two areas of research. Part of the explanation given for this, e.g. by TAC, is that the considerations of a possible expansion of the CG System coincided with the regular review of CGIAR priorities and future strategies. However, rather than combining these reviews so that decisions on a possible expansion of the CGIAR would have been dependent on the decisions on priorities and future strategies for CGIAR research, decisions on expanding the CGIAR were taken already at ICW 1990, while the TAC review of priorities and future strategies has yet to be concluded.
6.1.1 Unavailability of data - an obstacle to change

TAC has prepared what it calls "an advanced working draft" that reviews CGIAR priorities (TAC 1991c). This report can be seen as a second step towards formulating future strategies for CGIAR research; the first step was already taken in 1990(!) with the revision of the CGIAR mission and goals.\(^{17}\)

TAC has decided to review CGIAR priorities along three dimensions: an activity dimension, a spatial (geographical and agro-ecological) dimension and a commodity dimension. For each of these dimensions, i.e. among various activities, geographical regions etc., quantitative expressions of the "ideal" relative weights or priorities are calculated. This calculation - of the "ideal", so to speak - is made with the CGIAR mission and goals as the guideline for the choice of aspects to be reflected in the priorities. Such aspects include proportion of poor in the population, value of production, risk of soil degradation etc.

The next step is to compare the "ideal" relative priorities with the actual distribution of CGIAR resources. This leads to the final step, in which this comparison in addition to other considerations (e.g. the need to ensure a certain degree of continuity in research) provides the guideline for decisions on which changes or adjustments should be made in future research programmes as well as how resources should be distributed among them.

The transparency which characterizes this entire process is very positive and even more positive is the careful manner in which the quantitative expressions of relative priorities between commodities, geographical and agro-ecological regions etc. are used. For example, TAC takes pains to warn of "the danger that in an analysis producing numbers - i.e. relative allocations to commodities - those numbers will be given greater credence than they deserve" (TAC 1991c:199).

Despite all good intentions, however, serious limitations persist that prevent the considerations concerning CGIAR priorities and future strategies from reflecting especially the more recent aspects of the CGIAR mission and goals. These limitations are determined

\(^{17}\) It should be noted that although the new CGIAR mission and goals can have far-reaching implications for CGIAR's work due to the substitution of the focus on "food production" with focus on "food self-sufficiency", it was never discussed extensively, probably due to being overshadowed by the issue of a possible expansion of the CGIAR.
by the data available on current CGIAR activities and resource allocations, as well as data on some of the aspects reflected in the "ideal" relative priorities.

The lack of data on CGIAR activities is illustrated by the fact that a questionnaire survey (ISNAR 1987) was necessary to establish the proportion of CGIAR Centre activities aimed at sub-Saharan Africa financed via special projects. Likewise, the fact that the IFPRI Study on the Location of the Poor (Broca & Oram 1991) was the first of its kind, and is still far from complete, illustrates the uncertainty of the data on which to calculate the relative priorities.

More generally, figures on distribution of CGIAR resources are only readily available for commodities, major programme areas and geographical regions, whereas e.g. data on distribution of resources along agro-ecological lines are not available (TAC 1991c:210). Thus, in considering the agro-ecological balance in CGIAR research, TAC takes recourse to its "feelings" (ibid.). Very limited information is available on resource use in relation to the content or targets of research - whether it is directed towards marginal or well-endowed areas; resource-poor or -rich farmers; whether it aims at developing high- or low-input technologies etc. Since these topics have been important in the discussions which have taken place since the mid-'eighties, this is indeed a severe shortcoming.

Regardless of how carefully the review of CGIAR priorities and future strategies is designed, the outcome can only be as comprehensive as the data on which it is based. Therefore, unless more complete data is made available, both for the calculation of relative priorities and on the current content and targets of CGIAR research, the review will be unable to reflect as important issues as concerns for the poor and for less favourable production environments in terms of agro-ecology, economic infrastructure etc., and the implications that such concerns should have for CGIAR's efforts in developing new technologies.

The issue of the appropriate distribution of resources between regions, i.e. primarily among Asia and sub-Saharan Africa which has recently been raised, serves as a good example of how lack of data limits the comprehensiveness of considerations. The present strong focus on sub-Saharan Africa, which is reflected in the allocation of approximately 40% of CGIAR expenditures to this region, originally emerged from a recognition that development of technologies for less favourable agro-ecologies had previously been
neglected. Less favourable areas, however, are not only found in sub-Saharan Africa but also encompass large parts of Asia and Latin America. Unfortunately the data presently available on CGIAR resource allocations does not allow for consideration of agro-ecological regions but only of geographical regions (TAC 1991c:210). This lack of data has presumably contributed to the "reduction" of the issue of developing technologies appropriate under less favourable conditions to one of research directed towards sub-Saharan Africa as opposed to Asia.

Furthermore, the great proportion of CGIAR expenditures that have been allocated to research aimed at sub-Saharan Africa over recent years, holds no guarantee that this research has also been designed to develop technologies for the less favourable production environments; on the contrary, the existence of a yield gap between actual and potential yields of approximately 80% for sub-Saharan Africa suggests that this has not been the case.

Thus, if the ongoing process of transition is to achieve the significance wished by many donors and other partners within the System, one precondition is that basic data are made available on all vital aspects of the System and its activities as a basis for the necessary far-reaching decisions.

6.2 Ecoregional Entities - an institutional innovation

Not all attempts to transform the CG System are, however, in vain. The proposal to establish ecoregional entities within the CG System represents an institutional innovation and is seen as a solution to the dilemma in which the Centres have increasingly found themselves: On the one hand, they have moved into more strategic research while on the other hand, especially in sub-Saharan Africa, they have engaged increasingly in adaptive research, including farming systems research. This dilemma was already identified in the CGIAR Impact Study, finalized in 1985, and it was foreseen that it would broaden rather than diminish over time (Jahnke, Kirschke & Lagemann 1987:27).

The research mandates envisaged for the ecoregional entities are extremely broad, ranging from location-specific adaptive research to strategic resource management research as well as functioning as links to the national research systems. Thus, they can be seen both as entities that would facilitate location-specific research, but also as a mechanism for freeing global commodity improvement research Centres from other obligations.
Although the ecoregional entities are a response to long felt need for more concerted efforts in location-specific research (as well as in strategic resource management research), the feasibility of the proposed entities being able to solve such a broad range of problems must be carefully considered.

The first and most fundamental question is whether it makes sense at all to conduct location-specific research within an international research system, and thereby perform the functions intended for the national research systems. This is discussed in section 6.3 below.

The second objection which should be raised here relates to the division of labour and competence between the ecoregional entities and the global commodity Centres. Keeping in mind that the more detailed plans for the operational mode of the ecoregional entities have yet to be finalized, this, however, still appears to be an issue which has received remarkably little attention.

In its documents, TAC operates with the concept of "design criteria": The ecoregional entities are envisaged to identify the technological needs specific to their ecoregion and on this basis, formulate "design criteria" to help targeting the work of the global commodity Centres. Though developments have now made farming systems research a concept of the past, at least in CGIAR research, the basic principles are the same. Thus, the experiences from farming systems research seem highly relevant in this context, notably that there are severe difficulties in receiving recognition from "traditional" commodity researchers, seem highly relevant in this context. Linking ecoregional entities with global commodity Centres is mainly considered, in the TAC documents, in terms of ensuring good lines of communication. However, in the light of the farming systems research experiences, the aspect of mutual responsiveness among the partners involved seems equally important. If this aspect is not taken into consideration, it may prove difficult for an entity placed in a less favoured ecoregion to convince global commodity Centres placed in other parts of the world to follow the identified "design criteria". In the "default" setting, commodity improvement research, especially if it makes use of biotechnologies, enjoys higher scientific status than production systems research, and thus it will have the last word.
6.3 CGIAR’s Relationship with National Research Systems

Although the issue of CGIAR’s relationship with national research systems has long been regarded as important, it is a recent phenomenon to give it explicit consideration. Two aspects of CGIAR’s relationship with national systems are considered: i) the need for coordination among CG Centres regarding their activities with national systems; and ii) the CG System’s responsibility and capacity for strengthening the presently weak national research systems.

Especially the second aspect has given rise to controversies: While a number of donors would like to see the CG System playing a more active role in strengthening national systems, including administering research assistance, TAC prefers to maintain the principle that CG Centres are primarily research institutions. Instead, to prevent the weak state of many national systems from hampering the effectiveness of CG Centres’ research, TAC is willing to give in on another CGIAR principle, namely that CG Centres should primarily be responsible for conducting strategic and applied research. Thus, TAC’s position could be criticized as one of substituting rather than strengthening national research systems.

The ecoregional entities are intended to play a central role in both the above mentioned aspects - i.e. both in coordination of CGIAR activities and in strengthening national systems.

In relation to coordination, the ecoregional entities should serve as the coordinating link between global commodity Centres (and subject matter Centres) on the one hand, and the national systems within the ecoregion on the other. There is, however, a high risk that, in effect, they become yet another link placed in between CG Centres and the national systems. Commodity researchers within national systems are likely to feel more closely aligned with similar researchers and programmes at the global commodity Centres, and subsequently, to prefer to communicate directly with these Centres rather than via the ecoregional entities. Furthermore, some countries encompass a great diversity of agro-ecologies, which makes it difficult, if not meaningless, for them to associate themselves with a single ecoregional entity. Having to maintain links with several ecoregional entities drastically reduces possibilities for effective coordination. Finally, in many regions
research networks such as SAC CAR already exist. Rather than duplicating these by establishing new institutional mechanisms, such networks would be obvious candidates to serve as coordinating bodies, possibly with the provision of additional technical and financial assistance.

The role which ISNAR could (and should) play in this context deserves more detailed consideration, since issues relating to coordination and to keeping national systems in touch with donors are part of ISNAR’s mandate. Therefore, it is surprising to note the very limited attention devoted to ISNAR so far.

In relation to the second aspect - the CGIAR’s role in strengthening national research systems - the ecoregional entities are envisaged to conduct research in order to diagnose problems and adapt solutions within their ecoregion. It is hard to imagine, however, that ecoregional entities with two or three teams of 8-10 scientists should be able to achieve results, which in terms of quality (in-depth location specific understanding) and quantity (coverage of many diverse locations) would exceed what could be achieved by the many national teams of scientists working within adaptive research if these latter were provided overall supervision and, not least, improved working conditions. Therefore, instead of trying to make CGIAR research effective by filling the gaps in adaptive research itself, the CG System should direct genuine attention to identifying the actual needs for strengthening the national research systems. Inevitably, this would involve a certain proportion of research assistance.

Identifying constraints to the effectiveness of national research systems is another area falling within the mandate of an already existing CG Centre, namely ISNAR. Hence, this is a further reason to involve ISNAR in the, possibly regionally based, initiatives to strengthen the national research systems and thereby facilitate CGIAR’s relationship with the national systems. However, this should not be done without actively involving and collaborating with national researchers (and not only research planners), on whose participation the ultimate success of any such initiative depends.

6.4 The Sustainability Perspective in CGIAR Research

More than five years have passed since "sustainable food production" was made part of the CGIAR mission statement. Much has been said since then about sustainability but very little has happened. Some would argue, however, that there were no reasons to expect a
lot to happen: "Sustainability is not a new concept to the CG Centres..."; "...it is clearly
discernible in much of what the Centres do..."; "...has been one of the major thrusts of
CGIAR research...", it has been said. Thus, it only needs to be further strengthened.
Others, particularly the donors, expected the focus on sustainability to have major
implications on the direction of CGIAR research, of its focus and content. Donors, there­
fore, requested the preparation of a number of reports to outline these implications.

However, neither the TAC sustainability report from 1988 (TAC 1988) nor the following
reports prepared by the Sustainability Committee (e.g. Leonard 1989) have provided any
concrete proposals for change in the Centres' research. Rather, they have praised the
Centres for their contributions to sustainable agriculture. New areas of research as a result
of the goal of sustainability have almost exclusively been considered as additional to
present research programmes, provided that additional financial resources can be made
available.

Thus, rather than outlining concrete proposals for change or even adjustments, the reports’
major contribution - though perhaps unintended - lies in their description of the conflict
that surrounds the issue of sustainability, namely the conflict seen between directing
research towards traditional versus so-called open, green revolution-type of production
systems, or between high versus low input use, biological versus chemical farming etc.,
just to mention a few of the designations used. Apparently, the existence of this conflict
within the CGIAR, as well as the opinions and pressures to which the System is exposed
from the outside, has so far made it impossible for the CG System to formulate its own
stand.

Three ways or types of action to strengthen the sustainability perspective in CGIAR
research have been proposed in the reports and, not least, in the discussions taking place
at the CGIAR meetings relating to its possible expansion.

The first and, in its effect, the most radical, is to reflect clearly the sustainability
perspective in all CGIAR research. Secondly, the concern with sustainability is seen to
necessitate strengthening of certain areas of research within the CG System, particularly
resource management research. The third type of action considered concerns strengthened
CGIAR efforts in conservation of resources, notably plant genetic resources.
Though these types of action are in no way exclusive, only in relation to conservation of resources has some agreement been reached within the CG System, hence enabling the formulation of concrete initiatives. In principle, no one disagrees on the importance of conservation of resources, of forests and plant genetic resources, i.e. of bio-diversity. Disagreements start, however, as soon as the question is raised of how this should be done.

Reaching a common agreement on issues relating to resource management is a different case. Discussions on resource management research, or factor research as it was initially termed, have continued for a decade or more. Until recently, TAC has argued strongly against resource management research as an independent area of research within the CG System. Resource management research was seen partly as an integral part of the multidisciplinary approach guiding productivity research, and partly it was referred to institutions outside the CG System. The TAC report elaborating on the ecoregional approach to research in the CGIAR (TAC 1991a), however, marked a major shift in TAC’s position. Thus, today, strategic and applied resource management research are, at least formally, accepted as independent areas of research within the CG System.

Nevertheless, TAC has missed important opportunities to prove that this shift is genuine. The uncertain destiny of soil management research within the CG System is one example. Despite the recognition that serious gaps exist in strategic soil management research in a global context, IBSRAM was not approved for inclusion into the CGIAR. Instead, strategic and applied resource management research, including soils research, were referred to the proposed ecoregional entities without specifying, however, whether all ecoregional entities should cater to research on all resources and all aspects of resource management or whether some sort of division of responsibilities should be sought; neither is it specified how many financial resources and research personnel should be allocated to resource management research, or by which criteria this should be decided.

Finally, TAC has already taken steps which deviate from its initial proposal that all CGIAR research should be conducted from a sustainability perspective. The assignment of responsibility for developing sustainable production systems specifically to the ecoregional entities entails a danger that other parts of the System, e.g. the global commodity Centres, feel that they are free of the obligation to seriously consider sustainability. Furthermore, as in the case of resource management research, concrete descriptions are lacking of what the content of the programme area, sustainable production
systems, should be. Thus, it is unclear whether TAC sees research in sustainable production systems as identical to adaptive research, to be carried out by multi-disciplinary teams operating within research domains, diagnosing problems and adapting solutions, as earlier described.

The vagueness of the proposals regarding research in resource management and sustainable production systems is alarming. In view of the conflicts characterizing discussions in this field, more detailed proposals are needed as a follow-up to the, at least official, recognition recently gained by these areas of research. Otherwise, risks are high that genuine research in resource management and sustainable production systems will be silenced, and as mentioned earlier, that ecoregional entities will only act as testing and validation sites for the global commodity improvement Centres.

6.5 Poverty Orientation of CGIAR Research

Since the mid-seventies, research to benefit the poor has been an explicit goal for the CG Centres. However, there has been a tendency that, due to intensified concern with sustainability and its implications for CGIAR research, the concern with poverty has receded into the background.

As an illustration, the CGIAR research programme in farming systems research has disappeared from the System's most recent reports, and has been replaced by a programme on resource management research. Though the two programmes have a number of features in common, the fact that the social and economic dimensions are completely absent in the framework for resource management research, as outlined by TAC, clearly indicates that the shift is more than merely a "renaming". Without taking social and economic dimensions into consideration when identifying problems and adapting solutions, there is little chance that these will be applicable for poor(est) households. In addition, recent years have shown a tendency to consider poverty and (in)equity as agro-ecologically determined phenomena, rather than as socially and distributionally determined, although a recent IFPRI study (Broca & Oram 1991) provides evidence against this understanding of poverty. Apart from this study, however, very little has been written or said on the issues of poverty and inequity in recent years.

Despite the long history of the poverty focus within the CG System, its interpretation and more exact implications for CGIAR research are, thus, still far from evident.
First, it is still unclear whether the aim is that CGIAR research should contribute to alleviation of poverty in absolute terms, i.e. ensure that everybody has access to sufficient and cheap foods, or whether CGIAR research should also contribute to the alleviation of inequity, i.e. specifically aim at improving the conditions of the poorest relatively to the better-off.

Secondly, it remains an unsolved problem how to identify which research programmes would be the most relevant in order to meet the goal of benefitting the poor(est) farm families. In the TAC 1985 review of priorities and future strategies, the problem was reduced to a matter of selecting the commodities for future research. However, rich as well as poor farm households cultivate important crops such as maize and rice. Hence, focusing research on the poor is much more complex than focusing on the commodities that poor farmers produce. Although, the review of CGIAR priorities and future strategies which TAC is currently undertaking is much more comprehensive than the 1985 Review, serious problems persist that prevent the poverty aspect from being adequately reflected in the formulation of priorities and future strategies. Rather than the commodities they produce, what distinguishes rich households from poor is their access to productive resources which determine the techniques they employ, and the goals they (have to) pursue. As discussed in section 6.1, a precondition for reflecting such aspects in any future attempts to formulate CGIAR priorities and strategies, and to evaluate the impact of research for the poor is that data is made available on CGIAR activities and resource allocation not only according to commodities but also according to production systems and resource requirements. This in itself, however, is far from sufficient. If poverty orientation is to characterize CGIAR research in the future, poor households’ objectives and their access to productive resources have to be better understood and reflected as a "design criterion" in all CGIAR research.
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