Overseas Development Institute

Briefing Paper

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THE CGIAR: WHAT FUTURE FOR INTERNATIONAL AGRICULTURAL RESEARCH?

The Green Revolution which brought high yielding rice and wheat varieties to many parts of Asia in the 1960s and 70s is the most widely recognised, and for some the most controversial, dimension of contemporary agricultural change in developing countries. Yet much less is heard about the system of agricultural research centres which provided the basis for the Green Revolution; which expanded and diversified in its wake; and which now faces declining budgets and an uncertain future. That research system is supported by a unique association of donor agencies, the ***Consultative Group on International Agricultural Research*** *(CGIAR), with a current annual budget of approximately $215m. Recent debates regarding development assistance to agriculture have brought the CGIAR to an important crossroads. Donors will soon be making decisions that will have far-reaching effects on the way that international agricultural research will be organised and supported in the future. This Briefing Paper reviews the history and structure of the CGIAR, explains the nature of the crisis it faces, and describes some of the options for its future.*

The CGIAR

The CGIAR is a collection of public and private sector donors which supports the work of eighteen international agricultural research centres (IARCs) (see Table 1). The group was established in 1971 as a way of channelling and coordinating donor assistance to agricultural research for developing countries. Its current mission statement is: 'Through international research and research-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 of low-income people'.

The CGIAR can trace its origins to agricultural research sponsored by the Rockefeller and Ford Foundations. Work carried out by the Rockefeller Foundation and Mexican scientists beginning in the mid-1940s led, by the 1960s, to the diffusion of semi-dwarf wheat varieties to the Punjabs of India and Pakistan, to northern Mexico, and other areas. In 1960 the Foundations established the International Rice Research Institute (IRRI), the world's first international agricultural research institute, in the Philippines, and IRRI's semi-dwarf rice varieties quickly spread through much of Asia. The success of these short-statured, early maturing rice and wheat varieties that responded efficiently to fertiliser and water became dubbed the Green Revolution: by 1980, more than half of the developing world's rice and wheat land was sown to the new varieties. When the CGIAR was founded in 1971, four IARCs had been created. By 1980 the number had grown to 13, and

Table 1: The CGIAR and Core Funds of the International Agricultural Research Centres 1993 (US$m)

Original members founded before CGIAR		
IRRI (International Rice Research Institute), 1960	Los Baños, Philippines	26.3
CIMMYT (Centro Internacional de Mejoramiento de Maiz y Trigo), 1966	Mexico City	23.1
IITA (International Institute of Tropical Agriculture), 1967	Ibadan	20.8
CIAT (Centro Internacional de Agricultura Tropical), 1967	Cali, Colombia	25.3
Founded, or adopted, after 1971		
ICRISAT (International Crops Research Institute for the Semi-Arid Tropics), 1972	Hyderabad	26.0
CIP (Centro Internacional de la Papa) 1970	Lima	14.7
ILRAD (International Laboratory for Research on Animal Diseases), 1973	Nairobi	10.3
ILCA (International Livestock Centre for Africa), 1974	Addis Ababa	11.8
IPGRI (International Plant Genetic Resources Institute), 1974	Rome	8.6
WARDA (West Africa Rice Development Association), 1970	Côte d'Ivoire	5.4
ICARDA (International Centre for Agricultural Research in the Dry Areas), 1975	Aleppo, Syria	16.2
ISNAR (International Service for National Agricultural Research), 1980	The Hague	6.1
IFPRI (International Food Policy Research Institute), 1978	Washington, D.C.	8.1
Founded, or adopted, after 1990		
ICRAF (International Centre for Research in Agroforestry), 1977	Nairobi	11.2
IIMI (International Irrigation Management Institute), 1984	Colombo	6.1
ICLARM (International Centre for Living Aquatic Resources Management), 1977	Manila	3.8
INIBAP (International Network for the Improvement of Banana and Plantain), 1984	Montpellier	1.8
CIFOR (Centre for International Forestry Research), 1993	Bogor, Indonesia	5.0

with a recent expansion the group is now composed of 18 centres. There is a distinction between the consultative group and the research centres that the group supports. The group itself is informal: it has no constitution, by-laws or written rules of procedure. It is composed of a chair (traditionally a vice-president of the World Bank), three co-sponsors (the World Bank, FAO, and UNDP), donors (see Table 2), and 10 non-donor representatives of developing countries. Although the CGIAR provides review and auditing procedures, donors make their contributions directly to the individual IARCs. The World Bank provides facilities and staff for a CGIAR Secretariat, which supports the chair and carries out administrative functions. The three co-sponsors also support a Technical Advisory Committee (TAC) to review the activities of the IARCs and to advise on priorities for international agricultural research.

Table 2: CGIAR Core Grants 1993 (US$m)

US	40.4	France	3.2
World Bank	40.0	Belgium	2.5
Japan	32.6	Ford Fdn.	2.3
Canada	15.8	Austria	1.5
Germany	13.3	AfDB	1.1
EC	12.1	Rockefeller Fdn.	0.9
UK	9.4	Arab Fund	0.7
Switzerland	9.2	Ireland	0.7
Netherlands	8.3	Spain	0.6
UNDP	7.3	IFAD	0.6
Sweden	6.2	China	0.5
IDB	5.1	India	0.5
Denmark	4.8	Indonesia	0.5
Norway	4.6	Korea	0.5
Australia	4.2	IDRC	0.5
Italy	3.9		

The Record

The centres have clearly had a major impact on tropical agriculture. Feeding current developing countries' populations at prevailing nutrition standards without access to the improved crop varieties developed by the CGIAR centres would require at least sixty per cent more land. The value of the new rice and wheat varieties released to farmers between 1961-65 and 1979-81 alone is estimated at $50bn. But there has been much scepticism about the Green Revolution, directed mostly at the distributional effects of the new technology. Critics pointed out that the farmers who were the first to take up the new techniques were those with more resources, and that the technology favoured irrigated over rainfed areas. However, a growing body of research has shown that the early fears of the Green Revolution technology being captured by larger farmers were generally unfounded, but a clear advantage still remained with the favoured agricultural areas.

The acknowledgement that many farmers were unable to take advantage of the new crop varieties led the IARCs to diversify their activities from the mid-1970s to developing agricultural technology appropriate for the diverse rainfed environments that had not benefited from the Green Revolution. Most IARCs initiated research programmes that took account of these varied environments and looked at the broader social and economic concerns that were important to farm family welfare. Research in areas such as biological pest control, soil management, livestock production, agroforestry, and aquatic resource management were added. At the same time, the IARCs continued to develop new varieties of maize, beans, cassava, millet, sorghum and other crops, as well as additional innovations in rice and wheat, that reached a growing number of farmers.

The great expansion and diversification of activity in the IARCs in the 1980s was not matched, however, by a commensurate change in farming practices and technology in developing countries. Some progress was made, but the results were nowhere near the level of the Green Revolution. It became obvious that the Green Revolution represented a one-time technological advance that was unlikely to be repeated. Neither donors nor scientists could base their plans on the promise of equivalent breakthroughs, and both would have to be prepared for slower progress in agricultural technology development.

Donor Priorities

In the 1980s, donor concerns about slow progress in agricultural technological change were compounded by a broader set of concerns about agricultural development, dominated by the environment. Alarms were raised at the rate of deforestation in the developing world, and agricultural expansion was seen as partly to blame. Environmental contamination due to high input use in agriculture achieved increasing recognition in both developed and developing countries, and for many critics the 'modern agriculture' promoted by the IARCs was an obvious target (even though it made input use more efficient). As science took greater control of genetic codes, fears grew that private capital would gain control of much of the world's germplasm, and the spread of the IARCs' modern crop varieties was seen by many as an example of this challenge to biodiversity. At the same time, many donors began to cut back on their support to national agricultural research programmes, the major partners of the IARCs. Part of this was a result of structural adjustment programmes aimed at making the public sector more efficient. In addition, donors were also finding alternatives to public sector agricultural research. Donor support for NGOs increased substantially, and many donors felt that NGOs, who often worked in areas that had not benefited from technological change, had more direct contact with the poor and provided a more effective alternative than the state agricultural research and extension services. The private sector, particularly national and multinational seed companies, became better established in many countries as well, and some donors saw this as a further alternative to public sector research.

As a result of these shifts in interest, agricultural technology development, at least in the sense represented by the IARCs, is not currently at the top of most donors' agendas. But the challenges of improving food supply and rural incomes remain, and to these issues of production and equity is now added the problem of environmental sustainability. Thus food production must be improved in such a way that the rural poor achieve more secure and productive livelihoods; provision must be made for the billion people who will add to the world's population in the next decade; and the environment has to be protected and enhanced.

Funding for the CGIAR

Given the doubts about the direction and purpose of agricultural research, it is not surprising that funding for the CGIAR has suffered. In the past five years, the core funding available to the CGIAR has fallen by more than 20 percent (see Figure 1). In real terms, the CGIAR has core funding in 1994 that is roughly equivalent to the amount available in 1979, despite considerable expansion in the number of IARCs.

These cuts were not only the product of uncertainties about the future and importance of agricultural research. Most western nations were undergoing economic downturns that affected their total development assistance levels, which themselves were being stretched to meet new concerns such as financing for Eastern Europe. But the contradictory donor pressures that led both to an expansion in the number of IARCs and a contraction in total funding has left the CGIAR in a precarious position.

The uncertainty in funding has been compounded by the way the CGIAR has operated. Each year, donors make pledges to the core programme of the CGIAR, but the IARCs have a certain degree of freedom to look for their own funding for 'complementary' activities (those not included in the core programme). Complementary and special project funding is increasingly attractive to donors by giving them tighter control of funds and making support more responsive to their own mandates. The resulting duplication of efforts, on the one hand, and failures to muster a critical mass of support for high priority activities, on the other, have led many to suggest that the funding mechanisms for the CGIAR require an overhaul.

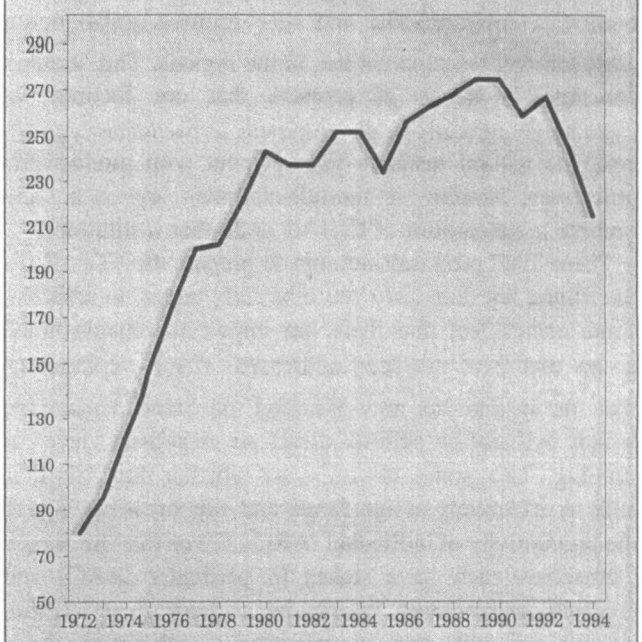
When the CGIAR held its 1994 mid-term meeting in New Delhi, its new chairman, Ismail Serageldin, outlined a set of proposals that attempt to set the CGIAR back on course. The proposals centre on ways of stabilising CGIAR funding and operations while at the same time addressing some basic management issues. The World Bank would make a one-time grant to the CGIAR to forgive its current debts, and is also willing to expand its role as donor of last resort for the CGIAR. The chairman also offered a challenge to donors to help bridge the growing gap between the annual CGIAR core research agenda approved by the TAC (and adopted by the donors at their annual meeting), and the funds that actually become available to the IARCs. For 1994-95 this gap is estimated to be $60m. The Bank will recommend to its Board that it cover up to one third of this gap if it is matched by donor contributions. The new chairman also challenged the donors to introduce more discipline and a longer time horizon into their funding of the CGIAR.

But these suggestions for stabilising CGIAR funding are contingent on the resolution of other issues relating to the organisation of international agricultural research and the division of institutional responsibilities. These are treated in the following two sections.

The Organisation of CGIAR Research

As the CGIAR grew and the number of IARCs expanded, with a corresponding broadening of mandates, several organisational inefficiencies appeared. There are, for example, overlapping responsibilities: more than one IARC may have a plant breeding programme for a particular

Figure 1: CGIAR Core Funding 1972-1994
US$m



crop. This has led the TAC to a broad review of CGIAR research activities and the development of plans for improving the efficiency of the system. These plans are based on the assumption that the CGIAR has a strong advantage in research with the following characteristics:

- Economies of scale: many research activities are more efficient if carried out at a limited number of sites. Each country does not require a breeding programme or germplasm collection for every crop, for instance.
- Long-term perspective: most national programmes do not have the resources to invest in research that is long-term, complex and risky; but many of the priorities for natural resource management, enhanced animal health and innovative crop improvement are of this nature.
- Spillover benefits: research conducted at one site often has benefits for other locations, in other countries, and this is one of the major advantages of an international research system.
- International public goods: the CGIAR develops products, methods, practices and approaches that can enter the public domain in developing countries.

The TAC has proposed that the CGIAR be organised along two major axes: global activities and ecoregional activities. The global activities include many of the CGIAR's current responsibilities in crop and livestock improvement. Global non-commodity activities for the CGIAR include: genetic resources (including germplasm collection, conservation, characterisation, and utilisation); institution building, public policy and public management research for agricultural research; and water management research. TAC has examined the priorities among CGIAR commodities, and will review the organisation of research over the next several years. A decision has already been taken that the centres working on livestock (ILCA) and animal health (ILRAD) will be combined.

The second axis proposed by the TAC focuses on 'ecoregional' activities. This involves the delineation of 14 regionally defined agroecological zones. TAC proposes that focusing research on a limited number of ecoregions will

accomplish three objectives: (i) improve the efficiency of research on sustainable production systems, (ii) improve productivity by focusing global research activities on particular environments, and (iii) improve collaboration with national research entities in the regions. This strategy envisages a series of projects that are focused on sustainable agricultural development in particular regions; combine natural resource management with productivity objectives; employ a multidisciplinary approach; and involve a consortium of CGIAR and other institutions.

These TAC proposals attempt to prepare the CGIAR for the future, but they have yet to be fully tested. In addition, some critics feel that there are important organisational issues that have not been addressed. There are concerns that the system has now assumed too broad a mandate, which will not be able to attract an appropriate level of funding. Also, some observers ask whether the CGIAR is able to effectively assign funds and support according to the productivity of individual IARCs. Given that the donors themselves each have stakes in particular IARCs and research programmes, it may be a question of whether donors are still able to effectively collaborate for a common goal, as they did at the inception of the CGIAR.

Institutional Responsibilities

There is no better illustration of the uncertainty that has affected the organisation of international agricultural research than the definition of relations between national research institutions and the IARCs. Early CGIAR goals were focused on strengthening national public sector agricultural research institutions. The 1960s saw the beginning of a long period of local and donor support to national agricultural research institutes in many developing countries, and the establishment of the CGIAR played an important role in that movement. But this support began to wane in the 1980s while alternative sources of technology development, especially NGOs and the private sector, came to the fore.

The CGIAR explicitly addressed this changing situation by defining its clients as national agricultural research systems (NARS), which according to ISNAR, comprise 'all of a country's entities responsible for organising, coordinating, or executing research that contributes explicitly to the development of its agriculture and the maintenance of its resource base.' Despite the broadened definition of NARS, the IARCs still have the majority of their experience with the national agricultural research institutes.

The CGIAR stance towards NARS remains equivocal. On the one hand, the CGIAR has traditionally been seen as a leader in providing training and consulting support to the NARS. On the other hand, tighter budgets and recognition of the CGIAR's comparative advantage for more strategic research have encouraged a reduction in CGIAR funds for strengthening national research programmes, often with the assumption that these programmes are getting stronger. But this assumption is belied by the precarious budgetary and personnel status of many of even the largest national research institutes. The CGIAR thus finds itself in a position where: (i) its traditional clientele of public sector research institutions is both financially weak and forced to redefine its own role *vis a vis* other national institutions; (ii) it is less able to provide much of its traditional types of support to the NARS; but (iii) its success is dependent upon the NARS' capacity to collaborate with the IARCs and to utilise the IARCs' products.

Proposals put forward in the midterm review attempt to address this dilemma. The World Bank is going to put more effort into strengthening the link between the IARCs and national agricultural research and extension services. In addition, the World Bank will be able to provide up to $500m of combined IBRD and IDA resources per year for the next five years to support national agricultural research and extension, contingent on the recipient country's commitment to strengthen its own institutions. This is a major initiative towards national research and extension systems, although it leaves a number of questions unanswered. Is it to be based on the Bank's previous experience in funding agricultural research and extension, which has had only partial success? How much attention will be paid to ensuring that local institutions are placed on a sustainable footing, and how will this be balanced against the usual requirements and limitations of donor project support? Perhaps most important, will other donors be persuaded to emulate the Bank's commitment?

Conclusions

The CGIAR has played a key role in agricultural development during its first two decades, but now finds itself in a crisis of direction and support. In the face of these problems, the TAC has set about redefining CGIAR priorities and organisation and the CGIAR chairman has provided new ideas for funding, issuing the challenge that the 'research agenda should drive the budget, not the other way around.' But the response remains to be seen. The donors will have to re-examine their own priorities for agricultural development and devote much more attention to a coordinated effort supporting both national and international agricultural research. Developing countries will have to consider the growing evidence that they have been under-investing in agriculture, and commit themselves to reinvigorate their own agricultural institutions, as well as to take full advantage of local level and private sector capacities to meet national goals. And the CGIAR itself will have to deliver a plan for the organisation of international agricultural research which meets the challenges of increasing productivity, improving distribution and protecting natural resources, and which also provides fresh motivation and purpose to agricultural scientists in national and international institutions.

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