CGIAR

CGIAR—How it all began

by Warren C. Baum and
A Commentary by Lloyd T. Evans

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Warren C. Baum, the author of *Partners Against Hunger*, is now retired from the World Bank.

1. CGIAR—How it all began

Partners against Hunger—Consultative Group on International Agricultural Research (The World Bank, 1986) draws on the experience of Warren C. Baum as chairman of the CGIAR for 10 of its 15 years of existence. Baum, a World Bank vice president, traces the CGIAR's origins and development and discusses how it is organized and managed, the issues it faces, and the lessons that can be learned from its experience. Below is a brief summary of events leading to the formation of the CGIAR in 1971, as extracted from the book's first two chapters.

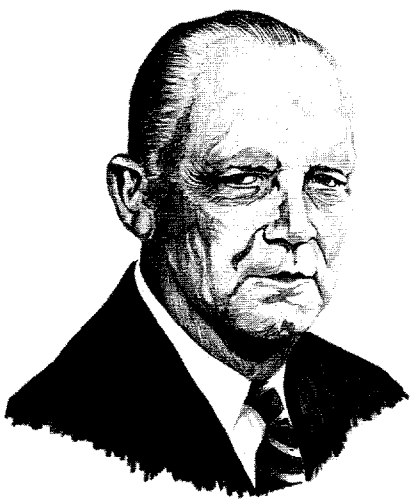
The 1960s and early 1970s were a period of widespread public and scientific concern that rapidly rising population in developing countries would soon outstrip the world's capacity to provide food. The Malthusian threat of a world food crisis, which gained considerable credence in the mid-1960s, has now retreated. Among the factors that produced this result, one was the evolution, with the support of the international aid community, of an agricultural research system to combat hunger in large parts of the developing world.

A few eminent men, drawn from international organizations, national governments and private foundations, devised an innovative system to fund and manage agricultural research. Each of the centers constituting the system was to be both autonomous in management and international in character. This new breed of research centers, loosely joined together, would work under the umbrella of the CGIAR, an informal, voluntary association of donors, operating without a legal charter on the basis of a sense of common purpose.

Early cooperation

The first cooperative effort in international agricultural research was begun in Mexico in 1942, jointly by its government and the Rockefeller Foundation. Henry A. Wallace, who as vice president-elect represented the United States at the November 1940 inauguration of a new Mexican president, played a leading role in this initiative. A former secretary of agriculture and an Iowa corn breeder with worldwide recognition, Wallace spent a month in Mexico during which he talked with leading agricultural officials. Wallace's advocacy of work to raise yields of food crops to improve living standards eventually persuaded the Rockefeller Foundation to take up agricultural research to complement what it was doing in Mexico in the area of public health.

Rockefeller sent a four-man team to Mexico, led by J. George Harrar, who later became president of the foundation. Norman Borlaug, who won a Nobel prize in 1970 for his work, took charge of the wheat-breeding program in 1945. His early research ran into a yield plateau. In 1953, he obtained from Orville Vogel at Washington State University, a few seeds of semi-dwarf lines made from crosses between U.S. domestic varieties and Norin 10 from Japan. The Japanese variety was the result of work on dwarfing, going back at least to 1870, which



J. George Harrar

culminated in the release of Norin 10 to the country's farmers in 1935. After a first unsuccessful attempt, a new Mexican variety with high-yield potential in tropical areas was evolved in 1955. It took another seven years of experiment before the first Mexican semi-dwarf varieties, Pitic 62 and Penjamo 62, were released for commercial use.

India's work on Mexican wheat varieties, with seeds made available by the U.S. Department of Agriculture for world-wide trials, was already showing promising results when Borlaug visited the country and neighboring Pakistan in 1963 at the invitation of their governments. Semi-dwarf wheats were first planted extensively in the two countries in 1967. The harvests moved the trend of wheat productivity decisively upward, marking the beginning of one-half of the Green Revolution and instilling confidence in the search for new technology under international auspices.

Rockefeller and Ford Foundations at forefront

The second half of the Green Revolution followed the establishment in the Philippines in 1960 of the International Rice Research Institute (IRRI), the first of its kind, through the joint efforts of the Ford and Rockefeller Foundations. The idea had been mooted in 1954 in a paper by two Rockefeller Foundation officials, Warren Weaver and Harrar. Following visits to Asia in 1952 and 1953, they had concluded that "many of the fundamental physiological, biochemical and genetic problems are essentially independent of geography, and they are certainly independent of political boundaries." They felt an international institute would be the most cost-effective way to concentrate expensive equipment and assemble talents from around the world to work under optimal conditions. Their proposal called for operating expenses to be met jointly by major rice-producing countries of Asia, while the capital investment would come from the foundation. It fell through because each of the countries approached said it would gladly support a research institute, but only if it was located in its territory.

Forrest Hill, who joined the Ford Foundation as its vice president for overseas development in 1955, visited India the next year to take a look at Ford-assisted work which focused on community development as the means to improve rural incomes. He came to recognize that improvement of crop yields through new technology, as well as a capacity to absorb and apply it, was an indispensable condition for making any significant headway.

At a meeting of officials of the two foundations in 1958, Hill suggested to Harrar that the foundations collaborate in rice research, drawing on their respective strengths. This started consultations, culminating in Ford agreeing to provide capital funds and Rockefeller the scientific staff, some brought in from its work in Mexico, to set up IRRI.

As it happened, Hill and Harrar, working for their respective foundations, commuted together to New York City from the suburb of Scarsdale, New York from time to time. The friendship of the two men made possible close collaboration between the two foundations, marked by fewer frictions than one might expect even within any single large organization.

Borlaug's work in Mexico had pointed the direction that IRRI's research should take. From multiple crossings between dwarf and tall varieties, the most successful was that made between Peta, a tall Indonesian variety then widely grown in the Philippines, and Dee-geo-woogen, a Taiwanese variety thought to have been transferred from southern China several hundred years earlier. Following highly promising trials in several Asian locations, IRRI released its first named variety, IR8, in 1966. Its rapid adoption throughout the rice-growing areas of Asia came as a pleasant surprise to both Harrar and Hill. They had envisaged a time horizon of 10-15 years to develop a dwarf rice variety. In fact, it took only four from the time IRRI research got under way.

Following a visit by Mexico's President Lopez Mateos to the Philippines in 1963, Rockefeller's Mexican program was transformed by 1966 into CIMMYT. This was to be an international program to link Mexican wheat and maize varieties with other breeding programs around the world. The new Rockefeller initiative followed the end of the national program with Mexico for which the latter assumed full charge in 1962. Rockefeller shifted to an international focus, partly because of encouragement from Ford which began sharing operating costs from 1967.



At left is Syntha, a traditional tall rice plant from Indonesia, and at right is higher-yielding IR8, a semi-dwarf rice that was rapidly adopted by farmers throughout Asia in the 1960s.

Broadening involvement

Successes in rice and wheat led Harrar and Hill to envisage the establishment of additional centers "at strategic points in the undeveloped world." The first such center was IITA with responsibility for the improvement of agriculture in a specific ecological zone, the low, humid tropics. The charter of IITA was promulgated by a decree of the Nigerian government in July 1967. Though the host government gave strong support, work proceeded slowly because of civil war in the country. The research program got under way in 1970, while construction of facilities was completed in 1972.

The fourth and last of the centers launched by the two foundations was CIAT. It grew out of a cooperative agricultural program with Colombia begun by Rockefeller in 1950, following the initial successes of the Mexican program. The proposal, made jointly by Ford and Rockefeller officials, was that the institute, like IITA, should have a regional orientation. Ford's decision-makers had some initial reservations about the research program, but the foundation joined as an equal

partner in sharing CIAT's operating costs within three years of its founding in 1966.

By 1967, the four institutes were in various stages of planning, construction and operation, and costs were beginning to mount rapidly. The foundations recognized that the finances they themselves could provide would not be sufficient to permit the centers to reach their full potential. Moreover, the early success of CIMMYT and IRRI had given rise to proposals for additional institutes to work on other crops or regions. Recognizing the resource gap, estimated by Hill in mid-1968 at US$5 million to US$10 million for the four institutes, he felt the time had come to "go public."

Following the lifting of a Congressional ban on assistance for food crops that might limit U.S. exports, prompted by the acute food shortages in South Asia in the mid-1960s, John Hannah, administrator of the U.S. Agency for International Development, was receptive to the foundations' plea for support. The Canadian International Development Agency (CIDA) and its president, Maurice Strong, were also responsive, but parliamentary approval was delayed as Canadian wheat was piling up at the time in warehouses as a result of bumper harvests. An approach was also made to the U.N. Development Programme in 1967-68 but with no immediate results.

Bellagio meetings

FAO director-general Addeke Boerma had, in one of his first actions as the head of the U.N. agency, called a meeting in 1968 at U.N. headquarters in New York to promote coordination of agricultural aid for the developing countries. Attended, among others, by officials of FAO, UNDP, the World Bank and the Ford and Rockefeller Foundations, the meeting considered the idea of convening a conference under U.N. auspices to push the concept of coordination. The two foundations had reservations, however, about a large formal meeting in which government officials would predominate. Sterling Wortman, director of agricultural research of the Rockefeller Foundation, proposed a small, informal gathering of heads of agencies and organizations working on agricultural problems of the developing countries. Held at the Rockefeller conference facility in Bellagio, Italy, on April 23-25, 1969, it was a landmark in the events leading to the formation of the CGIAR.

The participants at Bellagio were the heads of FAO, UNDP and the World Bank, the heads of British, Canadian, Swedish and U.S. aid organizations, and senior representatives of the Asian Development Bank, the Inter-American Development Bank and Japan's Ministry of Foreign Affairs, in addition to top officials of both foundations. It was a disparate group of individuals, some of whom had never met before and had no experience of working together. The meeting did not begin to come to grips with the need for research on new technology under

international auspices until Hill, in a homespun and persuasive presentation, described how new varieties were transforming agriculture in areas like India's Punjab.

Later in the discussion, Robert S. McNamara, president of the World Bank, raised the idea of forming a consultative group or consortium to mobilize funds. Hannah promptly seconded the idea, indicating the U.S. government would consider contributing 25 percent of whatever amount the others could raise. The new technology and the new means to fund it were beginning to fall in place. "The importance of vastly superior technologies of production was a thread running through the entire meeting," as the informal summary of proceedings put it.

The Bellagio meeting envisaged multilateral and bilateral support for a hierarchy of research institutions, ranging from international institutes to regional and national agencies. While there was a consensus on additional support for the existing four institutes, and even on funding some new ones, the modality of mobilizing resources was left vague.

Perhaps the key to the meeting's success was its particular amalgam of scientists and aid administrators. As Wortman said later: "While those of us who were scientists thought we knew roughly what was needed, we had no idea what might be done to marshal funds and expand the system. It was here that McNamara, Hoffman (of UNDP), Hannah, and Wilson (of Britain's Overseas Development Ministry) and others excelled." Indeed, they did. In the course of three days, the Bellagio meeting progressed from a general consideration of broad issues of agricultural development to focus on a highly promising avenue for initiatives to deal with the problem of world hunger. The meeting ended with a decision by the participants to meet again a year later.

On the donor side, DAC (Development Assistance Committee of the Organisation for Economic Co-operation and Development) was the first off the mark. Its chairman, Edwin M. Martin, was at Bellagio. At an informal meeting of experts held within weeks of Bellagio, strong interest was expressed by a number of country representatives in promoting agricultural research in the developing countries under international auspices. Rockefeller Foundation's Will M. Myers, who chaired the Bellagio gathering, was asked to suggest precise forms of assistance to the international institutes. His only suggestion for any kind of umbrella organization was that the DAC secretariat could serve as an intermediary, at least for arranging initial contacts, between institutes and aid agencies.

UNDP also responded promptly. At a governing council meeting in June 1969, Paul Hoffman, head of the agency, referred to Bellagio and expressed his personal opinion that "on the basis of what had



Forrest F. Hill

already been accomplished by basic research in certain agricultural fields, UNDP participation is almost obligatory."

FAO was already assisting a number of projects to help developing countries adopt new varieties to increase food production—an outcome of a 1968 staff paper identifying high-yielding varieties as one of the five areas warranting special effort. Within six months of the Bellagio meeting, the FAO conference held in November 1969 endorsed the organization's interest and active role in agricultural research.

In the case of the World Bank, its lending for agriculture was still modest, and research as such did not figure in the lending portfolio. A staff working paper written in 1967, debating the role the Bank should take, found opinions sharply divided. But this was before Bellagio. Fired by enthusiasm following his participation in the April 1969 meeting, McNamara launched a campaign to make the Bank the lead agency in mobilizing funds for agricultural research. Staff work to flesh out a specific proposal began in earnest.

Cosponsorship

At the annual meeting in September of the Bank's Board of Governors, McNamara said in his opening statement that the Bank was ready to offer both technical advice and financial assistance in dealing with the numerous problems that would have to be solved "if the hopes for the Green Revolution are to remain green." He added: "There is something further that I am convinced we ought to do. We should assume a greater role of leadership in promoting the agricultural research of today that will be the foundation of greater agricultural growth tomorrow." He called for "a new and sustained effort in applied research," jointly with the developing countries and with support from the Bank, FAO, bilateral aid agencies and the foundations. The following month, McNamara wrote to the heads of FAO and UNDP inviting them to join the effort. The two agencies accepted in principle. This was the first formal step towards the establishment, with the three agencies as cosponsors, of what would eventually be called the CGIAR.

The foundations warmly welcomed McNamara's initiatives, but there was a difference of opinion on how the international research effort should be managed. Although none of the would-be cosponsors contemplated taking a direct part in the management of existing or new research institutes, the three agencies envisaged a more formal and active role for a consortium or consultative group than the foundations thought desirable.

Differences over the need for, and the role of, a consultative group narrowed following another meeting in February 1970 at Bellagio, or Bellagio II as it came to be called. This was a meeting of senior technical officials—representing a wider range of development agencies than

those attending Bellagio I—to prepare for the second meeting of agency heads. A World Bank paper envisaged mobilizing resources through "a loose organizational framework, along the lines of consultative groups which have been set up to coordinate development assistance" to individual countries. The Bank was prepared to provide a secretariat and administer a general fund to which some donors might wish to contribute if they had difficulties in financing institutes directly. While some representation of donors on the boards of trustees would be appropriate, the group would not undertake any management or programming role. Bellagio II accepted this idea in principle, although some differences of approach remained.

The heads of agencies, meeting at Bellagio in April 1970, ended the debate by endorsing the idea of a consultative group, and urging the World Bank to take the initiative in setting up the group in consultation with FAO and UNDP. The meeting, Bellagio III, also authorized five feasibility studies out of a list drawn up by experts at the February meeting.

The scene now shifted to Washington. McNamara had unexpected problems in persuading the World Bank's Board of Executive Directors to authorize the role that the Bank had been asked to assume. He sent a memorandum to the Board in March 1970, after taking the unusual step of clearing it not only with the heads of FAO and UNDP but also with the two foundations. The memorandum reiterated the proposal for a consultative group serviced by a secretariat provided by the Bank. The Bank, it was suggested, should itself make a limited financial contribution in the form of grants for agricultural research.



Robert S. McNamara

The response from executive directors was generally favorable but some had significant reservations, leading to postponement of the scheduled discussion. However, the Bank went ahead and convened a meeting at UNDP headquarters in May to work out details of the consultative group proposal. The three would-be cosponsors met first as an executive committee, and were later joined by representatives of the Ford and Rockefeller Foundations and the Inter-American Development Bank. David Hopper, then head of Canada's newly established International Development Research Centre, attended as an observer. The New York meeting reached a consensus on several key issues. However, the first meeting of the Executive Committee was also the last. Other donors were not prepared to relinquish to the three cosponsors the degree of control implicit in the arrangement.

Still, the World Bank's Board had not yet reached a consensus. When the Board met on July 23 and 30, there was wide support for the initiative but some dissent as well. Some argued that FAO, not the Bank, should take the lead in setting up a consultative group. Even before these meetings, discussions with FAO at the staff level had settled

that it should take the lead in scientific and technical matters (including appointment of the chairman of a technical advisory group), and the Bank on financial and administrative matters.

Noting the strong reservations expressed by some executive directors, McNamara proposed as a next step consultations with the governments they represented to see if a consensus could be reached. Meanwhile, plans to hold the first meeting of the consultative group in October or November were quietly shelved. An intensive round of discussions took place in Washington and several European capitals. Some key governments softened their opposition or reservation to a point that McNamara could inform the executive directors on October 30 that no objection had been raised to holding an exploratory meeting to consider the establishment, terms of reference and organizational arrangements for an International Agricultural Research Consultative Group "or some comparable mechanism."

In preparation for the meeting scheduled for January 1971, another was held the preceding month in New York, headquarters of the Ford and Rockefeller Foundations. This meeting, now described as Bellagio IV, had as the principal item on the agenda the feasibility studies commissioned by Bellagio III. While no final judgments were made in deference to the forthcoming meeting of the consultative group, it was agreed that full funding of existing institutes should take priority over any new activities.

Bellagio IV participants considered the close involvement of the foundations essential to the success of the international institutes. The foundations agreed to continue their role in the management of the existing institutes and to assist in bringing into being one or two new institutes if their establishment proved feasible.

Following the preliminary meeting of January 1971, the first formal meeting of the CGIAR took place in May 1971—a little over two years after Bellagio I. To those familiar with the ways of international bureaucracies, this may well be regarded as its own variety of miracle. For the heads of a large number of international and bilateral agencies, or their senior representatives, to meet at such frequent intervals as a working party to bring an international organization into being is without precedent. This could not have happened without the sense of urgency that the heads of the three cosponsoring agencies attached to the enterprise and their readiness to sidestep jurisdictional issues to bring about a unique partnership among them. No less important was the continuing and strong support of the Ford and Rockefeller Foundations, and their willingness to share responsibility for the group of international institutes they alone had created and carefully nurtured.

A Commentary by Lloyd T. Evans

Evans is chief research scientist in the Plant Industry Division of the Commonwealth Scientific and Industrial Research Organization, Canberra, Australia. He is a Fellow of the Royal Society, and has served as President of the Australian Academy of Science. A plant physiologist, he was a member of the CGIAR's Technical Advisory Committee from 1978 to 1983.

The diverse and far-reaching impact on food production in developing countries of the work of the CGIAR centers was assessed in the impact study and summarized in last year's *Annual Report*. But the CGIAR has had another kind of impact, less direct perhaps but of great long-term significance, on how agricultural research is both perceived and done. It is now seen to be highly productive even in tropical environments, and with a nudge from the CGIAR is becoming globally more integrated, more of a "one world" enterprise than any other field of biological research.

Partners against Hunger complements the impact study by documenting the ways in which the centers and the CGIAR have helped to bring about this quiet revolution. The book is also a rich source of insights into how this improbable, genuinely international and highly effective "system" has evolved, how it works, and why it is attractive to donors, developing countries and research scientists alike. In writing it, Baum has had access to many sources not in the public domain, which makes the book an enlightening account of the origins and development of this experiment in informal international collaboration. Not unnaturally, we are told more about the beginnings from the perspective of the World Bank than from that of the other sponsors and participants, but the account is even-handed and informative. Yet even his sources are silent on some matters, such as the origins of TAC, which sprang forth fully armed at the meeting in January 1971 with no record of why such a body, not mentioned in the earlier discussions at Bellagio, should suddenly be thought necessary. And, of course, there are times when a discreet chairman must pass over lively human interactions for the sake of continuing consensus.

Interactive system

But my purpose here is to highlight a few aspects of the impact of the CGIAR on agricultural research, some of which relate to the individual centers and others to the CGIAR as a whole. Throughout, from the very first paragraph, Baum refers to the CGIAR as "the system." This is an appropriate word for what the CGIAR has now become, but in its

origins it was more "a loose federation of independent centers" or, as another founding father put it, "not an organization at all, but an arrangement for consultation." Just as the play by Pirandello had six characters in search of an author, so the CGIAR could easily have become merely 13 centers in search of a system. But Sir John Crawford and the other early architects of the CGIAR had in mind something more comprehensive, more integrated, more interactive.



Sir John Crawford

Of the amount spent on agricultural research, the CGIAR system represents only about 7 percent of the total for developing countries and less than 2 percent of the world total. It neither can, nor aspires to, replace the national research systems, but it can and has played a catalytic role in transforming attitudes to agricultural research *vis-à-vis* extension, and to the corporateness of such research. As "the system" has itself developed, it has also helped to integrate the agricultural research efforts of the Third World, through its networks and training activities, and now increasingly involves scientists from developed countries in the agricultural problems of the developing ones. In building its own system, it has catalyzed the formation of an emerging global one.

Commodity focus

But let us look first at some of the ways in which the centers have influenced agricultural research. Their first lesson was simple but telling, namely the benefits of concentration of effort on a single commodity or problem if rapid progress is required, a lesson of which even the CGIAR needs to keep reminding itself in the face of the temptation to tackle ever more problems. Much of the world's agricultural research is organized by discipline, and by focusing on particular crops, the centers brought a commodity woof to this disciplinary warp, greatly strengthening the fabric of research. Their early success highlighted the advantages of strong interactions between disciplines.

In the early centers, the major interdisciplinary effort was focused on plant breeding, which has generated the lion's share of the impact of the CGIAR. Beyond that, however, the way in which the plant breeding was done and the goals formulated for it reinforced the whole concept of an international center. There were the advantages of scale in bringing together at one place a really comprehensive pool of genotypes, of making a wide range of crosses between them, and of assessing them for many characteristics in many environments. Similarly the goal of broad adaptability, enunciated so forcefully by Norman Borlaug, meshed particularly well with the concept of an international center, and was reinforced by the development of more effective ways of analyzing the data from far-flung trials.

However, without wishing to bite the hand that has fed the CGIAR, several further points should be made about the plant breeding activities. The first is that while there are certainly economies of scale in the overall process of plant breeding, there are also disadvantages when the number of characteristics sought becomes too great. Secondly, although the emphasis on broad adaptability has been an effective strategy in the earlier stages of the breeding programs, once yield levels are moderately high, closer local adaptation may become more important in raising them still further. The greater regionalization of many of the CGIAR breeding programs is a recognition of this and a first step towards more localized breeding and assessment.

Such a trend will change but not undermine the role of the international centers in plant breeding in the future. Their closer association with, and more immediate knowledge of, the genetic resource collections, and the scale of their crossing and evaluation programs will continue to be of immense value to the world-wide plant breeding enterprise in the generation of useful new combinations, but the varietal finishing schools will probably be increasingly decentralized.



Medium-tall (left) and semi-dwarf (right) durum wheat lines are maintained in CIMMYT's germplasm unit for use in its breeding program, which has historical linkages to joint Rockefeller and Mexican efforts in the 1940s.

Continuing challenges

The genetic resources movement is now so well established that it is difficult to recall the sense of emergency that attended its birth. Ironically, it was the very success of the CIMMYT and IRRI breeding programs that led to concern about the fate of older varieties, land races and wild progenitors of the crops in the CGIAR portfolio, and eventually to the decision to establish the IBPGR as catalyst for their effective conservation. N. Vavilov and other crop scientists had set the scene, and the FAO panel of experts had defined the problem. What was needed was a body with the resources and the will to initiate and coordinate action, a role to which IBPGR acting in conjunction with the crop research centers was ideally suited. Between them they have not only conserved a vast amount of genetic material for future use by all countries, but have also heightened awareness of the value of these resources for plant breeding. Now the challenge is to see them better evaluated and more widely used, and it is here that the centers with the collections should be the prime movers. As a survey of U.S. plant breeders by Donald N. Duvick shows, they are often reluctant to use wild species or old varieties as a source of genetic variation unless they have no alternative, because of the time required to recover full performance. Genetic engineering techniques may reduce the problem of unwanted genes hitch-hiking along with the wanted ones, but there is clearly an important role for the centers in making more effective use of the accumulated genetic resources in future breeding programs.

Since plant breeding looms so large in "the system," and played so central a part in the concept of international centers, two other aspects should be mentioned. Warren Baum deserves our thanks for refraining, until almost his last page, from reference to conquests, whether of hunger or of pests and diseases. The Churchillian ring of such phrases is tempting to authors, but agricultural research is more like continuing guerrilla warfare against evolving pest and disease organisms than a decisive battle, especially in the tropics. The battle is never won, and the task becomes no easier, no less urgent, and no less in need of imaginative new approaches. I am talking about what has been called maintenance research, for which the CGIAR could provide as effective an example of leadership, as it did in the case of genetic resources. Such research could be quite as exciting and at least as significant as new gap-filling ventures.

If readers of Baum's book come away with the impression that the CGIAR has given far more attention to plant breeding than to agronomy in its drive to increase food production, or even that breeding alone suffices, that is not the fault of the author. It is part of the CGIAR mythology. Of course, it was the availability of cheaper nitrogenous fertilizers that generated the need for shorter-statured crop plants in the first place, to avoid lodging, but successive improvements in agronomy are also the key to breeding for greater yield potential, as well as to greater stability of production. Although there has been much innovative agronomic research at the centers, the agronomists are too often viewed as handmaidens rather than partners to the breeders. Donor enthusiasm for low-input agriculture has also contributed to the "poor relation" status of agronomic research in the system as a whole, which is all too evident in *Partners against Hunger*.

On the other hand, the CGIAR has certainly given a lead to agriculturists in both developed and developing countries in the related area of farming systems research. The first stripe review, led by John Dillon, was on this subject and considered farming systems research a highly appropriate activity for the centers because of its need to bring together expertise from many disciplines. On the other hand, the local specificity of much farming systems research makes it less apt, as the Bellagio meeting in 1977 and Norman Simmonds' review both emphasized. In the face of this wide spectrum of views on the usefulness and appropriateness of farming systems research, the CGIAR has experimented at various levels. There are several commodity centers with strong farming system programs; at one center, IITA, the major long-term task has been to seek viable alternatives to the bush-fallow system used in the humid tropics, although many other activities ebb and flow

around this goal; and one center, ILCA, was wholly dedicated to research on systems of livestock production. The problems being tackled are intractable and complex, and it is still too soon to judge the outcome but, whatever the final assessment, the CGIAR will be seen to have taken a bold and illuminating step in broadening the scope of agricultural research.

A related general question concerns the stability of food production. Here, too, the CGIAR is able to give comprehensive leadership in analysis of the problems, across an unparalleled array of commodities and regions, and at all levels of organization, whether of the individual crop variety, the farming system or of economic policies. All these levels were engaged at a meeting in Feldafing (Federal Republic of Germany) in 1985, initiated by IFPRI in conjunction with the Deutsche Stiftung für Internationale Entwicklung, which highlighted the unique contribution the CGIAR system can make in approaching problems of this complexity.

Catalytic role

This brings me, finally, to the impact of the CGIAR as a whole, as distinct from that of its centers, on agricultural research. As the impact report points out, what the system decides to do can have quite varied effects on both national systems and bilateral aid agencies. They may, like the poet Gerard Manley Hopkins, "admire and do otherwise," or they may boost their own efforts to match and interact with those by the CGIAR. And, as the impact study also shows, attitudes about the usefulness of agricultural research have been transformed. Beyond that, however, the CGIAR now sends highly significant signals to the research systems of both developed and developing countries through its discussions on priorities, on the geographic balance of its initiatives, its concern for equity, adverse environments, and sustainability. Shifts in the explicit goals of the CGIAR as enunciated in successive TAC papers on priorities and the Group discussions of them are noted, as are the centers' reactions to them. Given the power of shifts in fashion, one of the unsung strengths of "the system" is that the changing enthusiasms of both centers and donors can be tempered by the CGIAR, on the one hand, and by strong, autonomous boards of trustees, on the other—a point that is not altogether apparent in the Olympian perspective of how "the system" works which is given in *Partners against Hunger*. On the matter of adverse environments and equity, for example, the centers may be more acutely aware than the donors of the frequently strong inverse relationship between the need to solve a problem and its likely solubility.

This is not the place to debate current priorities, but the way TAC and the CGIAR have gone about defining these, as well as the priorities themselves, has had a major impact on the conduct of similar exercises in both the developing and the developed world. More Cartesian approaches are possible these days, but it is the collective experience and judgment brought together in the system as a whole which gives special weight to the priorities of the CGIAR.

This *gravitas* in its approach, the profusion of its networks, alumni and contacts in developing countries, the comprehensiveness of its research and documentation services, and the strength of the logistic support it can provide, make the CGIAR magnetic not only for agricultural scientists in developing countries but also for those in developed countries who want to bring their skills and imagination to bear on the world food problem. Increasingly the international centers are acting as marriage brokers between developed country scientists and developing country problems. They are the catalysts bringing the agricultural scientists of the world together to work more effectively on what is truly a world problem.

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