CHAPTER 4

Global partnerships and knowledge sharing: The foundation for innovation and impact

In this chapter:

CIMMYT's intention is to be a true partner in innovation, providing products, services, information, and technical expertise. Principles for partnering include:

- *Engage in strategic partnerships for specific purposes.*
- *Engage in collective priority setting and shared implementation.*
- *Emphasize equality in sharing resources, contributions, accountability, and credit.*
- *Wherever possible, work in a network mode that brings together multiple partners to solve complex problems, with each partner contributing from its particular area of expertise.*
- *Strengthen the capacity of partners so others can take on new roles and create additional synergies; devolve activities wherever possible.*

With respect to specific groups of partners, CIMMYT will:

- *Strengthen work with national agricultural research and extension systems in broad alliances of diverse partners.*
- *Actively harmonize and integrate CIMMYT's efforts with those of other CGIAR Centers.*
- *Continue to build relationships with private foundations, which often provide resources to assess and incorporate important new approaches to research and capacity building.*
- *Expand relationships with non-governmental and civil society organizations, especially in seed production and delivery systems, seed relief, and health initiatives.*
- *Establish more strategic and productive relationships with the private sector and advanced research institutes.*
- *Maintain strong links with international development agencies and global and regional development fora.*

Where appropriate, CIMMYT will play a stronger role as an advocate for alleviating poverty and hunger and promoting sustainable development through improved policies and technologies. This role supports all partners, resource-poor farmers and consumers above all.

To add value to its participation in partnerships and networks, CIMMYT will attend to the whole cycle of knowledge management. It will further an organizational culture to stimulate the acquisition, sharing, and evaluation of knowledge.

> Stakeholders...view CIMMYT as playing an essential coordinating role in a rich network...that transcends geopolitical boundaries, gives agriculturalists in less developed countries access to colleagues in more developed countries, and is unusually vertical in its membership, ranging from farmers to Ministers of Agriculture. Stakeholders observed that few organizations in agricultural research could claim an equally extensive network.—Summary of Meridian Institute report on stakeholders' perceptions of CIMMYT

Building on a strong network of partnerships

The consultations and analyses that led to the development of this strategy identified CIMMYT's extensive networks and partnerships as one of its greatest scientific and operational strengths. To achieve its global mission, CIMMYT will build on its partnerships in three ways. First, as counseled by our stakeholders, we will regularly engage partners in a more consultative, locally nuanced process for developing our global research agenda. Second, we will reinforce our research presence in Asia and Africa to address problems of poverty more directly where they are most extensive and severe. Third, we will build on the strength of these partnerships to expand the global public knowledge base for innovation in maize and wheat research.

This first part of this chapter examines the ways in which CIMMYT seeks to work with particular groups of partners—renewing our partnerships with the public sector, seeking more productive partnerships with the private sector and advanced research institutes, encouraging complementarities with other CGIAR Centers and NGOs, fostering innovation with private foundations, and partnering to engage in advocacy on specific issues. In all of these relationships, our intention is to be a true partner in innovation, providing products, services, information, and technical expertise. Our partnerships will emphasize equality in sharing resources, contributions, accountability, and credit. There has been some discussion of the transactions costs involved in extensive partnerships, but it is our belief that the approach described in this chapter will enable partnerships to become more efficient for all involved.

The primary resource shared and created by these partnerships is knowledge. Unlike a particular technology, which may be relatively short-lived, knowledge is a continually changing, renewable resource for science. The second part of this chapter explains a defining feature of CIMMYT's mission and strategy: the commitment to be an effective catalyst in a global knowledge sharing and innovation network.

Renewing public-sector partnerships

For an organization such as CIMMYT, whose existence is founded on developing public goods for developing countries, national research and extension programs and agricultural universities are natural allies. Many elements of this strategy, such as a greater regional presence in Asia and Africa, are intended to help CIMMYT become a more valuable and effective partner for the public sector in developing countries.

Based on consultation with many representatives of national research and extension programs, we envision that these long-standing allies will join us in forming broader strategic alliances for managing knowledge and innovation, as described later in this chapter. We also believe that there is great potential to work with these partners to become more effective advocates for policy interventions to alleviate hunger and poverty, as mentioned below.

Our extensive collaborative relationships with public organizations in developing countries, as well as with regional consortia of national research organizations, have stood the test of time—in many cases enduring national conflicts and natural disasters. The economic and efficiency advantages of the international maize and wheat research systems formed by CIMMYT and its public-sector partners in developing countries, as well as the considerable benefits generated by these systems, have been extensively documented (see Box 1.2, p. 4).

In light of the growing competition for resources to conduct public agricultural research and extension, however, some observers have questioned the sustainability of these primary research partnerships for CIMMYT. Money is not the only issue. The private sector's large investment in agricultural research, combined with its tendency to seek intellectual property rights over key processes and products, have raised barriers to innovation by the public sector. In some countries, the number of talented research staff working in the public sector has been depleted by emigration, opportunities in the private sector, HIV/AIDS, and civil disorder. Increased funding alone will not compensate for these losses.

Box 4.1

Public-sector partnerships prevent epidemics in wheat

International public-sector partnerships can be the best assurance that some potentially costly problems never reach farmers' fields. For example, a virulent race of yellow rust that arose in East Africa in 1986 migrated to North Africa, crossing West Asia and South Asia to reach Nepal around 1997. On the way, the new race caused epidemics and severe production losses in wheat in Ethiopia, Turkey, Iran, Afghanistan, and Pakistan. The multi-million dollar losses could have been reduced or avoided through concerted disease monitoring and control.

Today, a global network links CIMMYT, ICARDA, and national research organizations in Asia, Africa, and Latin America to report new rust races as soon as they appear and alert unaffected countries to potential epidemics. Scientists and decision-makers in each country use this information to decide whether susceptible wheats should be replaced with new resistant varieties, including some with durable resistance from CIMMYT. Countries in one region may ask CIMMYT to facilitate the testing of their experimental varieties in another region where a disease already has a head start, simply to ensure that they already have good resistance to a disease that may cross their own borders within a few years. This early warning network is a good example of how international public research partnerships produce a global public good—in this case, the prevention of costly epidemics. No single nation can accomplish this task, given that disease pathogens do not operate within national boundaries, and private companies do not address this kind of need at the global level.

Box 4.2

CIMMYT and other CGIAR Centers

Rather than providing an exhaustive list of the many ways that CIMMYT has collaborated with other CGIAR Centers over the years, we offer a few representative examples. Our work with other Centers has ranged from ambitious disaster relief initiatives, to long-term collaboration in research and training, to more mundane concerns such as the development of similar policies and procedures. Some of these efforts have been quite successful, others less so, but we are committed to learning from our experience to support the development of a more integrated, efficient CGIAR.

CIMMYT and several other Centers have formal arrangements for hosting each others' staff, with provision for local support and collaborative research. Collaboration with IPGRI is an essential feature of CIMMYT's work, especially with respect to clarifying and executing international legal responsibilities for conserving and sharing genetic resources. For decades, CIMMYT has worked alongside IITA in maize improvement for Africa and alongside ICARDA in wheat improvement for the Caucasus region, West and Central Asia, and North Africa (CWANA region). CIMMYT and other Centers collaborate in several Eco-regional and System-wide Programs. CIMMYT is currently the convening Center for the Rice-Wheat Consortium for the Indo-Gangetic Plains, in which IRRI, IWMI, ICRISAT, and CIP also have well-defined and highly visible roles. CIMMYT is active in the System-wide initiatives on Integrated Pest Management, on Participatory Research and Gender Analysis, and on Genetic Resources for Agriculture, and partners with the African Highlands Initiative and the Consorcio para el Desarrollo de la Ecorregión Andina (CONDESAN). CIMMYT, IRRI, and IPGRI lead the Challenge Program on Genetic Resources, and CIMMYT will actively participate in the other three programs established to date: Water and Food, HarvestPlus, and Sub-Saharan Africa.

Aside from these formal arrangements, numerous effective and informal partnerships between CIMMYT and other CGIAR Centers are based simply on mutual interest and a desire to get the job done.

Despite these trends, the public sector accomplishes many things that other organizations do not. Publicly funded research and development organizations often have national coverage, direct access to farming communities and local research facilities, a wealth of local knowledge not available elsewhere, and formal governmental support. They continue to play valuable public service roles, such as supporting the conservation and international exchange of genetic resources or monitoring for emerging disease epidemics (Box 4.1). Finally, the public sector in some countries has recently strengthened its commitment to advanced scientific endeavors, including biotechnology and other new research areas, in the service of agriculture.

For these reasons, and because of the proven effectiveness of our partnerships with the public sector, we envision that public research and extension organizations will remain primary partners in the years to come.

Partnering to support a renewed CGIAR

CIMMYT's history and evolution are virtually inseparable from that of the CGIAR. The Green Revolution in wheat and rice provided much of the impetus for the CGIAR's founding in 1971 (Box 1.2, p. 4). The CGIAR has been a powerful medium for channeling support and setting priorities for international agricultural research. CIMMYT values the determination within the CGIAR to forge the work of the Centers into a more efficient whole to take a coordinated approach to problems of hunger and poverty. This changing vision for the Centers has heavily influenced our strategy, which is intended to offer more opportunities for collaboration and effective change within the CGIAR. The agenda for international agricultural research is expanding, and collaboration is essential to ensure that resources are used intelligently.

CIMMYT and other Centers have partnered in many ways over the years (Box 4.2). The recently initiated Challenge Programs represent opportunities to engage multiple Centers and external partners in research on complex issues of wide significance. Perhaps equally important, the Challenge Programs will generate valuable lessons for how research might be organized and funded throughout the CGIAR. We foresee that similar institutional arrangements, though not on such a large scale, will be essential for success in the years to come (two examples of such arrangements are the Rice-Wheat Consortium for the Indo-Gangetic Plains and the proposed Soil Fertility Consortium for Southern Africa).

As mentioned in Chapter 3, a strong motive for organizing our research agenda into eco-regional programs is to foster greater interaction and integration with other CGIAR Centers. We will seek the expertise and collaboration of other Centers—and offer our support—wherever complementarities exist. Specifically, we will seek to work more closely with IITA, the World Agroforestry Center, CIAT, and ICARDA on eco-regional activities in Africa, Latin America, and Central and West Asia and North Africa, and with ICRISAT in both Africa and South Asia where our mandates overlap in water-stressed regions. Given the importance of maize-livestock systems in Africa, we will also seek to partner more closely with ILRI (for example, in developing dual-purpose maize varieties, or analyzing crop-livestock interactions related to conservation agriculture). Especially in Africa, we see many opportunities to collaborate with other CGIAR Centers in activities such as understanding livelihood systems, conducting participatory research, improving seed systems, strengthening policies and markets, and on a more operational level by sharing infrastructure and data analysis resources. Advances in genomics and overlapping cropping systems in South Asia make stronger collaboration with IRRI advantageous for both Centers. Our relationship with IFPRI will no doubt deepen as CIMMYT commits additional energy to policy and advocacy work. Synergies with all CGIAR Centers on capacity building, knowledge and information management, and intellectual property issues are essential.

> We never had enough to eat until we started producing seed.—Debaki Karki, Nepal, farmer, women's group leader, and CIMMYT partner

NGOs, farmer groups, and community and self-help groups

The spectrum of NGOs and CSOs, including community and self-help groups, relief organizations, and farmer advocacy groups, extends from small, locally organized groups to large international concerns. We have relatively longstanding relationships with some large NGOs, such as Sasakawa-Global 2000 and World Vision, and seek to form others. One of CIMMYT's most enduring research relationships is with the Patronato of Sonora, a council of producers in northwestern Mexico that has provided fundamental support to CIMMYT's research (Box 4.3, p. 34).

In many cases, NGOs and CSOs have complementary areas of expertise or resources (e.g., local contacts, expertise in community welfare issues, language skills) and similar goals (to improve livelihoods), all of which can encourage productive partnerships. Their local expertise is often invaluable for initiating constructive discussions of local needs and channeling resources to people for experimenting with technologies or practices that might meet those needs. In some of the increasingly unstable areas where CIMMYT is called upon to work, NGOs may be virtually the only lifeline to poor farm households. Here we highlight some kinds of partnerships with NGOs that are important for the future.

The Patronato of Sonora: Local support for global research

"The Patronato" (formally known as the Patronato para la Investigación y Experimentación Agrícola del Estado de Sonora) is an association of commercial and communal farmers in the state of Sonora in northwestern Mexico. CIMMYT researchers have high regard for the Patronato, based on decades of cooperation and support. Millions of farmers around the world would share this regard, if they knew the debt of gratitude they also owe the Patronato. More than 1,300 cultivars of wheat and triticale, released in 51 countries and grown on approximately 58 million hectares, can trace their ancestry to the fields and resources that the Patronato has provided to CIMMYT in the Yaqui Valley in northwestern Mexico. The dry environment in the Yaqui Valley is well suited for globally oriented wheat research because it can be managed to simulate agro-ecological environments throughout much of the developing world where wheat is grown.

Yaqui Valley farmers were the first to experience the benefits of the new wheats developed in the 1950s and early 1960s by the Government of Mexico/Rockefeller Foundation program that was the forerunner of CIMMYT (see Box 1.2, p. 4). In 1964 these farmers decided to create their own organization—the Patronato—to provide consistent support for agricultural research. The organization was subsequently expanded to include farmers throughout Sonora.

Most of the Patronato's funding comes from farmers' donations, based on a yearly quota (currently 0.00125% of their production per hectare) collected at planting. The Patronato also receives support from private companies and the State of Sonora.

In addition to providing funding for CIMMYT's wheat and maize research, the Patronato generously provides access to over 200 hectares of prime agricultural land close to the government's Northwestern Agricultural Research Center (Centro de Investigaciones Agrícolas del Noroeste, or CIANO), where CIMMYT also has the good fortune to work. In the course of developing this strategy, Patronato farmers have been actively involved with CIMMYT and CIANO in providing feedback for research and priority setting.

Seed production. One area in which alliances with NGOs and CSOs will continue to be crucial is in sharing information about seed production, especially for maize. The public sector has largely exited the business of selling seed to farmers, and for years to come, many of the world's maize farmers will remain far too poor and isolated to constitute an attractive market for private seed companies. By partnering with NGOs, local research and extension organizations, and the private sector, CIMMYT can share knowledge on producing good quality seed and create links between community seed producers and organizations that can provide information on new varieties. Through this work, communities gain better information about the new maize and wheat varieties and practices that are available to them, establish profitable local seed production enterprises, and improve crop production.

Seed relief. Relief agencies have the networks and expertise to help people return to productive, stable livelihoods in the wake of natural disasters, famine, or civil disorder. CIMMYT can partner with these organizations by providing appropriate seed and knowledge to help restore farming communities and rehabilitate the agricultural sector, including local research capacity. Ideally, CIMMYT seeks to establish partnerships with relief agencies before disaster strikes, enabling institutions to avoid bureaucratic impediments and respond more quickly.

Organizations dedicated to nutrition and health. Agriculture is a food delivery system for better nutrition and heath. By forming proactive links with organizations focused on health and nutrition, including the many NGOs and advanced research institutes active in this arena, CIMMYT can ensure that food production systems become part of an overarching strategy for delivering health and nutrition in rural communities, including those devastated by HIV/AIDS. Aside from the work to develop nutritionally enhanced maize and wheat varieties for the Harvest Plus Challenge Program, current projects, study how food systems must change to overcome problems of rickets and arsenic poisoning.

> The perception that CIMMYT's work is less politicized than that of other players has provided a great deal of comfort for partners at all levels. This honesty allows CIMMYT to create collaboration and understanding where other entities, acting alone, could or would not.—Summary of Meridian Institute report on stakeholders' perceptions of CIMMYT

Partnering with private foundations

CIMMYT has much direct experience of the ways in which private foundations encourage and support innovation in international agricultural research. Private foundations (the Rockefeller and Ford Foundations) were among the first to understand the potential of international agricultural research for development. Foundations continue to expand the boundaries of international agricultural research in many ways: they often bring new groups of partners together; they continually facilitate and support new approaches for working with farmers; they provide resources to explore promising applications of basic research; they invest in studies of emerging issues at the farm level; they help to create new channels for learning about and sharing technology; and they consistently support capacity building.

The value of this contribution cannot be overstated. It permits new thinking and experimentation in areas that other partners (sometimes representing more conservative constituencies) and CIMMYT itself may tend to avoid. To continue to challenge our assumptions, learn about different approaches to research and development, and integrate them into our work, we will seek greater collaboration with foundations (the Rockefeller, McKnight, and Gatsby Foundations, among others).

Box 4.4

Partnering with the private sector to reach maize farmers

CIMMYT develops improved maize and other products specifically to meet the needs of poor farmers, and by providing this technology to local seed companies free of charge, we can assist them in delivering improved seed at affordable prices. They gain access to our research products and resources (including information on seed production), and further improve them based on their local knowledge and expertise. Through their access to local seed markets, small seed companies help immensely in enhancing the impact of research at the farm household level, especially in less accessible rural areas where larger companies rarely operate.

CIMMYT will seek partnerships to license its products (including maize varieties and hybrids) to private companies in specific regions or countries. These partnerships will be formed in such a way that CIMMYT does not compromise its policy of providing free and unlimited access to its germplasm to any of its partners. The technology will remain in the public domain, and CIMMYT will retain its freedom to operate. It remains a challenge to find evenhanded ways of dealing with private companies when several operate in the same geographical area and wish to acquire our advanced germplasm for commercialization, but in some cases there are solutions. For example, the same CIMMYT maize inbred, which possesses high combining ability and other special attributes, might be used by two different seed producers to produce two different hybrids or varieties, depending on the proprietary parents that they use.

Strategic partnerships with the private sector and advanced research institutes

CIMMYT will establish more strategic and productive relationships with the private sector and advanced research institutes. Despite the frequently cited constraints to linking with these organizations, especially intellectual property constraints, the role of these organizations in developing and using new technology with important agricultural applications is widely acknowledged.

The private organizations with which CIMMYT works range from very small, local seed companies, which have little funding to conduct research and marketing programs, to multinational agriculture-biotechnology-chemical companies. Similarly, advanced research institutes include large and small institutes and universities, public and private, in both industrialized and developing countries.

The objectives of these partnerships are varied as well. They help us to acquire technology for our own use or for use across developing countries. They help to amplify the impact of research at the local level—for example, by providing improved seed to poor farmers at accessible prices (Box 4.4). They are important for CIMMYT to remain informed about scientific developments and trends.

Among advanced research institutes, academic institutions are particularly significant partners because of their long-term impact on research capacity and on the kinds of research that are done. The impact of the development community's investment in international agricultural research can be extended by creating better links between academic institutions in donor nations and CGIAR Centers. Young scientists in industrialized countries would encounter more opportunities and motivation to become involved in science to alleviate poverty and hunger. By influencing the academic research agenda in industrialized countries to take these problems into account, academic institutions would also increase their relevance and links to developing country researchers and academic institutions.

> CIMMYT will engage in science-based advocacy to increase the range of choices available to our partners and to the poor.

What is CIMMYT's strength in partnerships with the private sector and advanced research institutes? CIMMYT offers unique, genetically diverse germplasm of maize, wheat, and wild relatives with numerous traits of interest, such as broad adaptation, stress tolerance, and improved nutritional and industrial quality. We offer important information, both phenotypic and genetic, about that germplasm in a broad set of environments. We offer an international network in which we are a trusted partner. This network is an important avenue for advanced research institutes, which often lack wide contacts in developing countries, to implement their research at the farm level. The groundwork done by CIMMYT in development and training creates potential markets for the private sector and a pool of expertise from which private organizations often recruit staff.

Each partnership with private companies and advanced research institutes has its particular advantages/disadvantages and requires specific kinds of contractual agreements (including material transfer, intellectual property, and confidentiality agreements). CIMMYT gives high priority to ensuring that these agreements are congruent with international conventions, such as the International Treaty on Plant Genetic Resources for Food and Agriculture, and its own policies. Good legal counsel, especially with respect to intellectual property law, is essential to CIMMYT's future, both to ensure that CIMMYT fulfills its role as custodian and producer of global public goods, and to ensure that CIMMYT and its partners in developing countries can still access the best science for the benefit of farmers.

Other international and regional development organizations

CIMMYT will continue to pursue and strengthen its partnerships with a large number of international and regional development organizations, such as the World Bank, United Nations Development Programme, United Nations Environment Programme, and the United Nations Food and Agriculture Organization. Global and regional fora will also feature prominently among our partners—e.g., the Global Forum on Agricultural Research, the New Partnership for Africa's Development, the Southern African Center for Cooperation in Agricultural and Natural Resources Research and Training, the Asia Pacific Association of Agricultural Research Institutions, the Association for Strengthening Agricultural Research in Eastern and Central Africa, and the Southern African Development Community, to name only a few. Regional fora are especially important partners for setting priorities and developing more effective strategies for delivering technology for farmers.

Science-based advocacy for developing and delivering public goods

A wide range of stakeholders consulted during the development of this strategy advised CIMMYT to give greater attention to its role as an advocate to ensure that research truly fosters sustainable development. Building on a stronger capacity for policy analysis, we will participate more fully in the public debate on issues of importance to us, and our stakeholders, with the goal of influencing the process though which those issues are addressed and resolved.

CIMMYT's advocacy work will be informed by its unique scientific and humanitarian perspective. It will be done in partnership with others (IFPRI, for example) and focus on two specific objectives.

First, we will advocate when there is a good chance that by doing so we can increase the range of choices available to our partners and to the poor. One example is the debate over transgenic crops. CIMMYT, along

with other CGIAR Centers, can help assess the potential usefulness of genetic engineering for public plant breeding programs, objectively examine the potential risks and benefits of transgenic crops for poor producers and consumers, and encourage enlightened private-sector participation in using new science to resolve the problems of poor people. Another area where advocacy is sorely needed is the development of regional biosafety policies.

Second, we will advocate the use of technologies to benefit the poor, when advocacy is needed to turn research into impact. There are countless examples of promising technologies that never made it off the shelf because adoption was blocked by external constraints. For example, the formal and informal mechanisms that regulate the availability and sharing of seed may be ineffective, preventing farmers from obtaining better varieties. In the presence of such constraints, poor farmers rarely have the clout to bring about needed policy changes. CIMMYT, along with other CGIAR Centers, can provide that clout.

All of this work will emphasize accurate, science-based information and analysis. We will focus only on issues for which we and our partners can offer substantive, competent input. CIMMYT will not recast itself as a policy advisory organization and will certainly not make judgments about the political structures or orientation of any country or territory. To do otherwise would be irresponsible, given that our participation in apolitical innovation networks is crucial for achieving our mission.

Working as a global innovation network: A systemic approach to knowledge management

A fundamental change in CIMMYT's mission and strategy is an emphasis on knowledge sharing and innovation networks. The knowledge produced by CIMMYT and its partners will almost certainly become as important a "global public good" as improved varieties or practices. How will CIMMYT work with its diverse array of partners to create and share knowledge?

The acquisition and sharing of knowledge are complex processes, and innovation is not just a simple outcome of those processes. Anyone can be a knowledge and innovation catalyst, and anyone might be a user. It is often difficult to identify the elements that lead to innovation and understand how they fit together, but without that understanding, it can be challenging to foster innovation or to determine why it occurs in one setting and not another. There are countless examples of research organizations and networks that work well, and others that do not. For CIMMYT—which cannot work well without effective partnerships—it is crucial to know whether its own approaches to managing knowledge, partnering, and networking are leading to effective innovation.

The strategic shift towards catalyzing innovation

Who uses the knowledge—the information and technology—produced by CIMMYT? National agricultural research systems, other CGIAR Centers, the private sector (especially local seed and input providers), and NGOs may all incorporate knowledge from CIMMYT into their own efforts—for example, as inputs into further research, as seed for multiplication and distribution, and/or as technology packages (in the case of national research organizations or NGOs) that are used in rural development.

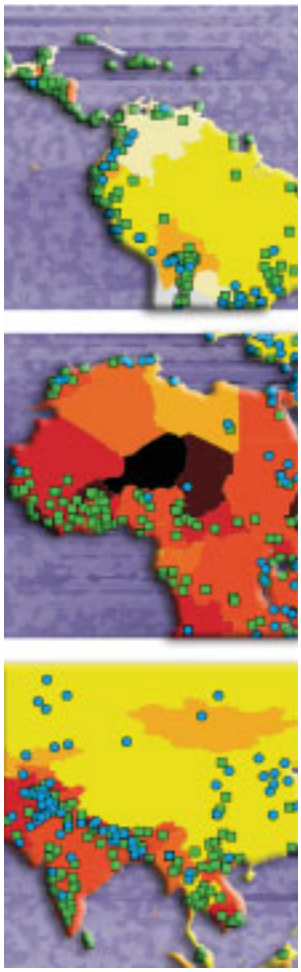
These same partners are all important sources of knowledge for CIMMYT as well. CIMMYT must be highly attuned to their heterogeneous and evolving needs, and to their changing capacity to generate, share, and apply knowledge. *This collaborative role is necessary for CIMMYT to succeed in its strategic decision to act not just as a technology provider but as a catalyst in an innovation network*. To take on this role, CIMMYT must make it a standard practice to conduct research priority setting, planning, and evaluation in collaboration with key stakeholders whenever possible.

The elements of a global knowledge system

The quality and usefulness of the knowledge that we create and share with others depends, to a great extent, on our own access to information and knowledge. CIMMYT must hone a strategy that allows access to new science (overcoming intellectual property barriers), databases, online journals, and other resources so that information is available to scientists and partners regardless of their location. CIMMYT must also continue to invest in tools to combine, interpret, and use a wide variety of data in further research.

It is human interactions that give these resources their value, however. CIMMYT will need to foster greater learning at the individual, group, and inter-organizational levels. Our new program structure is based on interdisciplinary teams to ensure the lively exchange of ideas to solve complex problems. CIMMYT, as the link in a network of a great variety of partners, is in a unique position to foster knowledge sharing across types of research (exploratory, highly innovative, "blue-sky" research; strategic global research; and adaptive research), across regions, and from farmers' fields to the laboratory and back again. By paying greater attention to this ability to span boundaries, CIMMYT will reinforce its role as a catalyst for innovation. We can facilitate "communities of practice" (groups with similar expertise and interests) that include researchers and practitioners around the world who are committed to addressing farmers' needs. By continually engaging with these partners, we will generate valuable new paradigms (in other words, new models or sets of assumptions) for understanding what we are learning from our work, how we are learning from our work, and when these new perceptions call for new solutions to research problems.

As part of this learning process, we will strive to ensure that all partners share information about the benefits, implementation challenges, and shortcomings of technologies, and continuing (or emerging) needs of farmers and collaborating institutions. Formerly the effort to sustain these information flows may have been seen as a transaction that detracted from CIMMYT's "real work" of applied science. In the future, supporting such information flows will be one of the foremost mechanisms through which CIMMYT adds value to the networks in which its science plays a crucial role.



> Supporting information flows will be one of the foremost mechanisms through which CIMMYT adds value to the networks in which its science plays a crucial role.

Although we have described this approach to knowledge management as if it were an isolated element of our strategy, it is not. The platform for developing new knowledge is based on:

- An agenda of strategic research challenges, understood in their real-life contexts and identified through our network of partners (Chapters 2 and 3).
- Effective partnerships and shared research paradigms to tackle the research challenges (Chapters 4 and 5).
- Information and tools for effective problem-solving (Chapters 3 and 5).
- A strong human resource base for knowledge creation (Chapters 4 and 5).
- A continual learning perspective that captures feedback from our partners and beneficiaries so that the knowledge creation cycle is dynamic (Chapter 5).

The practical implications for CIMMYT may be summarized as follows:

- Actively exchange information across organizational boundaries, and use that information to inform the workof CIMMYT and its partners—in other words, function as an open rather than a closed system with respect to information.
- Participate in diverse networks and partnerships, valuing them as multiple sources of information and expertise, as channels to improve the validity and usefulness of CIMMYT's products and services, and as a way of extending impact.
- Recognize that our most important assets are people, because they create and maintain scientific knowledge, networks, and relationships.
- Reward risk-taking and creativity, foster wide-ranging conversations across disciplines and programs, and intentionally learn from mistakes as well as achievements.
- Value individuals who embrace these principles, and develop procedures and an organizational culture to sustain them.

Conclusion: Committing to change

Clearly, to transform itself into the kind of organization envisioned in this strategy, especially with respect to sharing knowledge and fostering innovation, CIMMYT must make a strong commitment to working in new ways. We must draw on such practices as participatory priority setting and planning, strategic human resource management, critical interdisciplinary dialogue, partnering for technology dissemination, and innovative approaches to understanding impact from a systems perspective. The next chapter reviews some of the steps that must be taken for CIMMYT to move from strategy to practice.