

CGIAR NEWS

CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH AUGUST 1998

THE INDONESIAN CRISIS AND ITS IMPACT ON THE FORESTRY SECTOR

Jeffrey A. Sayer, Director General of CIFOR

The economic crisis in Indonesia began unfolding in mid-1997. A year later, it has resulted in public uprisings, a massive decline of the national currency, rising inflation, food shortages, and huge increases in unemployment and poverty. When Indonesia plunged deeper into civil unrest, many embassies, organizations, and companies evacuated foreign nationals from Indonesia.

In contrast, CIFOR decided not to evacuate its international staff, because Bogor, where its headquarters are located, remained relatively calm. All staff were given the option to work at home. CIFOR provided international staff the option of relocating temporarily to CIFOR offices and or those of its partners outside Indonesia. We acknowledge with gratitude IRRI's kind invitation to accommodate CIFOR staff at Los Baños. Fortunately, conditions did not worsen sufficiently to warrant relocation and most staff stayed on in Indonesia.

During this period, CIFOR made every effort to continue normal operations. CIFOR's Board asked me to remain in Indonesia until conditions stabilized

"CIFOR is committed to helping Indonesia – particularly its forest community – regain economic stability as rapidly as possible."

and, therefore, I did not attend the CGIAR Mid-Term Meeting in Brazil.

We at CIFOR are cautiously optimistic that economic and political stability will return to Indonesia in the near future. As CIFOR's host country, Indonesia has extended generous support and cooperation to us, including the gift of our excellent headquarters facilities.

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MESSAGE FROM THE CHAIRMAN

Ismail Serageldin

Before the sounds and sights of Brasilia recede deep into the vaults of memory, I want to thank the participants at the CGIAR's Mid-Term Meeting 1998 (MTM98) for the effective way in which all components of the System worked together to reach consensus on issues that are crucial to our mission and, at the same time, are fraught with many complexities.

Through combined efforts and goodwill, we reached closure at MTM98 on a phase of consultation and policy formulation about biotechnology that began at a stakeholders meeting in April 1997. That meeting was convened against the background of an emerging view, particularly among developing country scientists, that agrobiotechnology, with adequate safeguards, could be an important,

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THE INDONESIAN CRISIS AND ITS IMPACT ON THE FORESTRY SECTOR

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ICRAF's Southeast Asia offices are also located on this campus. Indonesia has also demarcated 300,000 hectares in the Bulungan forest in East Kalimantan for CIFOR to develop as a model for long-term research-based management.

CIFOR is committed to helping Indonesia – particularly its forest community – regain economic stability as rapidly as possible. Our scientists are monitoring the effects of the crisis on

Indonesia's forests and forest communities and are producing research reports. We have also posted a statement on the CIFOR homepage.

In the midst of the crisis, the Indonesian government's four main goals are to alleviate poverty, generate employment, improve public health care, and stabilize the national currency. Improved forest protection and management can support these goals. Forest protection supports the goal of poverty alleviation in as much as forests are a key source of income for Indonesia's poorest people. Foreign exchange income from the forest sector is an important income source for the country. Forest protection supports the goal of employment generation, because as many as 700,000 to 2,500,000 people depend on the forest sector for employment. Given that air pollution from the fires has been a significant health threat since mid-1997, forest protection is important to fulfilling health care objectives. Finally, forest protection is crucial to currency stabilization, because avoiding further fire-related costs helps maintain scarce foreign exchange reserves. The estimated cost of the fires is 35 to 40 percent of existing currency reserves.

Up until 1997, Indonesia enjoyed one of the most rapidly growing economies in the world with an average 5 to 6 percent annual increase of per capita gross national product. In the first half of 1998, Indonesia registered negative economic growth for the first time in 30 years. The depreciation of the currency and more competitive position of Indonesian commodities on the international market are two of the strongest factors affecting the forestry sector. The

international price of plywood remains low, but demand has risen. While revived demand for Indonesian plywood is good news for the economy, it raises concerns about forest protection as the potential for increased damage in production forests and unauthorized logging in protection forest appears to be high.

The economic crisis is also leading to expanding the agricultural sector. The most important commodity with respect to this development is oil palm. A high international price and low production costs in Indonesia mean large profit



Indonesian Forest

margins. The rapid pace of oil palm development implies increased threats to natural forest cover and forest-dependent peoples. A six-fold increase in the producer price of cocoa between mid-1997 and January 1998 has also greatly stimulated production. Coffee production has also increased, notably in North Sumatra.

On the basis of preliminary evidence, we believe it is likely that the economic crisis will increase pressures on Indonesia's natural forest cover. It follows that Indonesia has much to gain, even during this economic crisis, by increasing efforts to protect its forest resources.

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DR. NELSON RECEIVES MACARTHUR'S GENIUS AWARD

Rebecca Nelson was discussing potato diseases with a colleague from China when the phone rang and the representative of the John D. and Catherine T. MacArthur Foundation told her she had received one of the world's most coveted prizes: a MacArthur Fellowship, widely known as a "genius award."

Nelson is a molecular plant pathologist at CIP, but her work is not confined to the laboratory and greenhouse. The scientist believes the solution to many problems in agriculture comes from research in which the farmer plays a part.

This approach is growing in acceptance by the international agricultural research community, particularly in the CGIAR. Nelson struck the MacArthur Foundation as especially deserving of one of its fellowships, which recognize and encourage creativity. She was one of 29 new fellows from diverse fields who were named recently. The grant is for a five-year period, and carries no restrictions. A native of Bethesda, Maryland, Nelson received her Ph.D. in zoology from the University of Washington at Seattle.

"The creative person is at the heart of a society's capacity to improve the human condition," said Adele Simmons, president of the U.S.-based foundation, in announcing the awards. "Nelson is a plant pathologist concerned with the production of staple food crops in underdeveloped countries. Her studies have enhanced our understanding of infectious mechanisms of agricultural pathogens,



Dr. Rebecca Nelson

and she is disseminating the results of her research to farmers in the developing world, thereby reshaping their responses to plant diseases."

That's a succinct description of Rebecca Nelson's current work on integrated control of late blight, one of the most devastating crop diseases in the world.

Along with other CIP researchers, Nelson is using biotechnology and classical techniques to identify and eventually clone genes that provide resistance to late blight. As the leader of CIP's late blight project, Dr. Nelson is working to create new potato varieties with stable late blight resistance and improved methods for integrated disease management that are suitable for farmers in developing countries.

Nelson then takes research a step further. "I always wanted to practice my trade," she explained recently, "by blending biology, in the investigative sense, with the mission orientation that is the

privilege of the CG: to do something about the ills of the world. I like to investigate and understand the biology of a situation, but I also want to look at the human context."

One way to do that, says Nelson, is through farmer field schools, which professional researchers support, but farmers, who eventually serve as the instructors, operate. By involving farmers in the diagnosis and management of diseases, along with varietal evaluation and selection and decisionmaking power, she hopes "to switch disease management from one that is centered on fungicides to one that's centered on resistance, in which fungicides become secondary to resistance. The best way to do this is through farmer participation. It's very difficult to envision doing it any other way."

How does Nelson plan to use her grant? She'll purchase needed equipment for members of her project. She will rent a house for students and colleagues working at CIP's pilot farmer-participation site in the Peruvian Andes, at Cajamarca. She and her husband, freelance journalist and writer Jonathan Miller, will increase their contributions to charities. There may be a short sabbatical to Eastern Europe. But mostly, Nelson wants to continue performing the mission of applied, vitally practical research that is so central to the CGIAR system. "I love that mission," she said. "I find that mission wonderful, beautiful, and stimulating."

CGIAR HONORS THE

AS YOU SOW, SO SHALL YOU REAP

Scientists at ICLARM and other research organizations believe that present patterns of exploitation of marine resources are unsustainable—the world cannot continue to reap what it has not sowed. This view is contrary to conventional wisdom that exploiting the ocean for fish and marine invertebrates should be a prosperous sector, because fisheries, in contrast to agriculture and aquaculture, reap harvests that do not need to be sown.

Total estimated fish catches from natural stock worldwide have increased from around 74 million metric tons annually in 1984 to 84 million metric tons in 1994. So why are scientists and others concerned about overfishing, depletion of world fish stocks, and the threat of a gradual loss of this important source of food? Are we indeed causing unalterable damage to aquatic ecosystems and destroying this valuable source of food?

Researchers at ICLARM and the University of British Columbia have carefully documented and analyzed the pattern of world fish harvests since 1950 to show clearly that the wealth of the oceans is not limitless and human interaction with it is definitely causing changes that should be a serious cause for concern. They show that humans are “fishing down the food web,” changing the marine ecosystem and reducing the amount of higher quality, more desirable

food fish available from the oceans.

Scientists use a scale to define the feeding or trophic level within the marine food web: 1 for planktonic algae at the base of the food chain to 4.6 for the highest level predator fish. Within



Photo by Ismail Serageldin

this range fall each group of fish included in the Food and Agriculture Organization of the United Nations (FAO) statistics on global fish landings. When researchers at ICLARM and the University of British Columbia assigned trophic levels to actual fish catches between 1950 and 1994, they found that the average

trophic level of the fish caught showed a declining trend—from an average level of 3.3 in the early 1950s to 3.1 in 1994. Assuming that the fish humans prefer are mainly in the 2.5 to 4.6 range, the data indicate a decline of nearly 10 percent of the usable range over the last four decades. What this means is that although the total weight of fish caught has remained constant, the type of fish caught has deteriorated. Are we using fish lower down the food chain, because there are simply not enough of the top level species to catch? The answer, according to these researchers, is an unequivocal “Yes.”

When the researchers extended the analysis to a study of specific fishing areas, they found even greater cause for concern. Although going down the food



Photo by Ismail Serageldin

web is generally associated with a greater quantity of fish caught, there comes a point in the pattern of overexploitation where the fishery “collapses,” which is

YEAR OF THE OCEAN

usually caused by a major shift in the ecosystem. Then even fishing lower down the food web results in a lower overall catch. Data from the North Atlantic fisheries, perhaps the longest and most intensively fished area in the world, support this hypothesis.

Fish biologists have been saying for some time that the current patterns of exploitation are unsustainable and we are seriously depleting stocks of larger and more valuable fish. The ICLARM-University of British Columbia study, which used scientific analysis and an ecosystem approach, provides support for the view that we are moving from long-lived piscivorous bottom fish towards short-lived, low trophic level invertebrates and planktivorous pelagic fish. And although fishing down food

webs may initially result in larger catches, it eventually leads to a collapse of the fishery. The study concludes that fisheries management should “emphasize the rebuilding of fish populations embedded within functional food webs.” Given its mandate, ICLARM has already been working on this through its study of the impact of marine protected areas on regeneration of fish stocks and conservation of biodiversity.

REEFS AT RISK

Human activity threatens nearly 60 percent of the earth’s coral reefs, placing much of the world’s marine biodiversity at risk, according to the new study *Reefs at Risk: A Map-Based Indicator of*

Threats to the World’s Coral Reefs. Produced in collaboration with ICLARM, World Resources Institute, the World Conservation Monitoring Centre, and the United Nations Environment Programme, *Reefs at Risk* is the first detailed, map-based global assessment of coral reefs and human-made threats to these ecosystems. It marks a significant advance in understanding the condition of coral reefs.

To model areas where reef damage is predicted to occur, the study draws on information from sites known to be degraded, top coral reef scientists, and global data sets.

Coral reefs are among the most biologically diverse ecosystems on the planet, but until recently almost nothing was known about their conditions. The study offers a stark warning: human activities are posing grave dangers to reefs in most of the world’s oceans.

Given that countries benefit from tourism-related recreational value alone provided by their reefs, threats to coral reefs can be economically devastating. Reefs are also a vital source of food for many developing countries.

Sylvia Earle writes that *Reefs at Risk* “makes it possible to pull back and gain perspective on past problems as an effective way to participate—and perhaps prevent potential disasters in the making. The fate of coral reefs, the ocean, and humankind forty years from now and forevermore will depend on the intelligence, motivation, and caring of people now alive.”

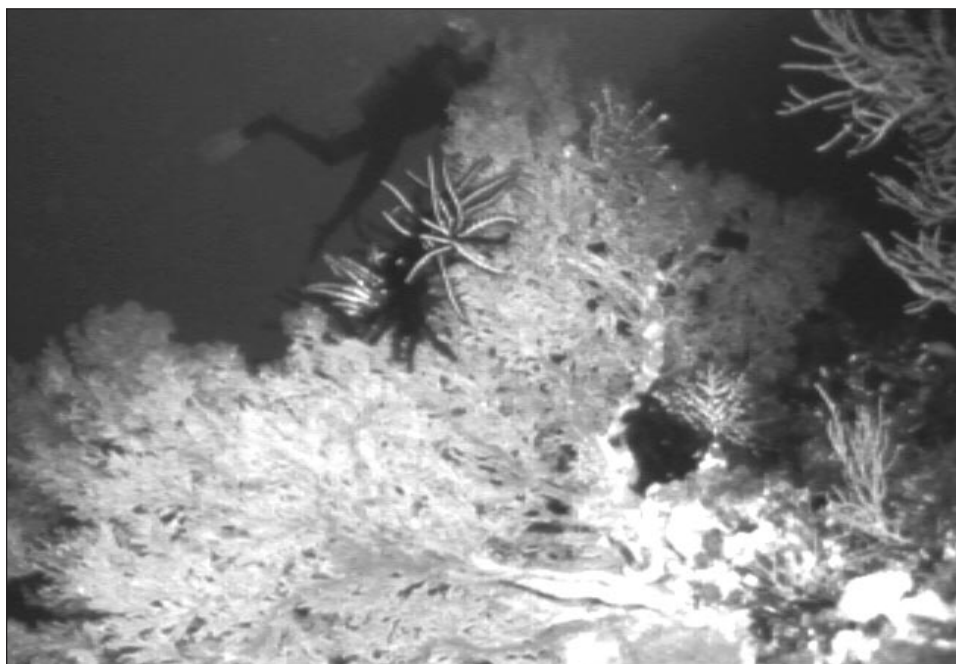


Photo by Ismail Serageldin

TOP HONOR FOR DR. PARODA

The Government of India has conferred “Padma Bhushan”—one of India’s most prestigious civilian awards—on Dr. R.S. Paroda for “distinguished and excellent service in the field of science and engineering (plant breeding).”

Dr. Paroda, currently Director General of the Indian Council of Agricultural Research (ICAR) and Secretary, Department of Agricultural Research and Education (DARE), Government of India, has a long affiliation with the CGIAR family. At the May 1998 Brasilia Mid-Term Meeting, he was unanimously elected as Chairman of the Steering Committee, Global Forum on Agricultural Research (GFAR).

Dr. Paroda spoke to CGIAR News about his work, the award, and his new responsibilities with GFAR.

✦ Q: What were your thoughts on being awarded the Padma Bhushan?

A: The announcement came as a complete, but very pleasant surprise. I was in Washington, negotiating the National Agricultural Technology Project (NATP) at the World Bank, when I heard the good news. The award is a source of tremendous satisfaction—both personally and professionally—and encourages me to redouble efforts in the cause of Indian agriculture and service to the nation. The award also highlights the importance the Government of India attaches to rural development.

✦ Q: What is the NATP project?

A: The basic premise of the NATP project



Dr. Paroda receives award from the Honorable President of India, Mr. K. R. Narayanan

is that continued growth in the agricultural sector is crucial for India’s broader development, because agriculture accounts for 28 percent of India’s gross domestic product and 15 percent of exports. India has invested heavily in public agricultural research and extension systems, and these investments contributed to the tremendous success in food grain production: from 51 million tons in 1951 to over 196 million tons.

But we cannot rest on our laurels. Demands for agricultural technology are changing, requiring us to break yield plateaus and embrace frontier sciences, such as biotechnology.

The NATP project will accelerate agricultural growth through the reform and strengthening of Indian’s agricultural technology development and dissemination

system. Indeed, at \$240 million, the NATP is the first project of its size for agricultural research and extension in a single country, entirely prepared and driven by the national agricultural system. I am confident that it will help to spur rural growth and deliver the benefits of modern science to India’s poor farmers working in ecologically-fragile environments.

✦ Q: What role do you envisage for GFAR?

A: GFAR is an excellent initiative, and I congratulate the CGIAR, and Chairman Serageldin for creating a forum that has the potential to play a catalytic role in promoting agricultural research at the global level. In Brasilia, I was delighted to be elected as Chairman of GFAR’s Steering



Committee. I have always felt that GFAR is uniquely positioned to serve the interests of developing country NARS by helping address those concerns that are outside the mandate of the CG System.

The forum is an absolute necessity because it brings about complementarity between diverse stakeholders such as the CGIAR, NARS, donor community, and our ultimate clients: the poor farmers of developing countries.

✦ Q: What next steps will you be taking to achieve GFAR's potential?

A: The establishment of GFAR offers

uncommon opportunities for strengthening ties between international, regional, and national agricultural research entities. It is clear that developing country NARS have varying capabilities. Some regional fora are already active. Some are starting up, and will need our sustained support. Therefore, my intention is to galvanize regional fora so that we can benefit from each others' experiences.

Communication and information dissemination will be at the core of this effort, and it is my earnest hope that we will be able to provide unbiased advice and support on a range of critical issues,

especially where weaker NARS are looking to the CG system for support. In this context, it is important to recognize that many of the critical themes of our time – biotechnology, genetic resources and enhancement, intellectual property rights, and global climate change to name a few – all transcend national boundaries, and it is only through a global, coordinated effort that we can hope to make a difference. I am convinced that if the GFAR did not exist, it would have had to be invented!

“LOST” RICE VARIETIES RETURN TO CAMBODIA

Phnom Penh, Cambodia — Three “new” traditional varieties of rice are once again growing in Cambodian farmers' fields, thanks to their conservation in IRRI's International Rice Genebank in the Philippines.

Because Cambodia possessed no cold storage facilities, its collection of rice germplasm was sent to IRRI in the early 1970s for safekeeping. Many of these traditional varieties subsequently disappeared in Cambodia during the long years of civil strife in that country as genebanks were destroyed or seed collections consumed by starving people.

“When people were forced to relocate by the Khmer Rouge government, they brought rice seeds from their own areas, but often these varieties were not suited to their new locations,” explains Edwin Javier, a Filipino plant breeder with the Cambodia-IRRI-Australia Project (CIAP).

In the 1980s, after the strife had ended, seed samples of the lost Cambodian rices were returned by IRRI at the request of the new government.

Recently, the Varietal Recommendations Committee of Cambodia released three strongly photoperiod-sensitive rice

varieties: CAR 11, a high-quality, medium-maturing variety with extra-long, slender grains; and two good-quality, late-maturing varieties—CAR 12 (with mild aroma) and CAR 13. “CAR” signifies Cambodian rice. Cambodia's rainfed lowland rice ecosystem is highly diverse, requiring varieties of different growth durations and photoperiod sensitivity.

“We can really attest to the value of conserving germplasm in the International Rice Genebank at IRRI,” says Dr. Javier. Eight of the 24 total varieties released since 1990 have been from this “lost” germplasm.

ACHIEVING SUSTAINABLE INTENSIFICATION IN AGRICULTURE

Timothy G. Reeves, Director General, CIMMYT

To be sustainable, farming systems must be economically viable, environmentally sound, socially acceptable, and politically supportable. To intensify agricultural systems in sustainable ways, we must seek a new approach to research, one that addresses whole systems, more effectively combines new technologies and traditional knowledge, and better integrates farmers and communities into research, development, and extension. We at CIMMYT summarize this new paradigm as G (germplasm) x E (environment) x M (management) x P (people). The following explores this new paradigm in terms of wheat and maize farming, but the paradigm can be applied to all types of farming.

THE ROLE OF GENOTYPE (G)

Improved, more robust wheat and maize genotypes add to the resilience of farming systems and reduce production costs by using available soil nutrients and moisture more efficiently, tolerating abiotic stresses such as nutrient deficiencies, soil toxicities, or drought, and contributing to biodiversity in farmers' fields.

In addition, improved genotypes make other important contributions to sustainability: higher productivity means less land is required to produce the same harvests; higher productivity in favorable



Timothy G. Reeves, Director General, CIMMYT

farming areas reduces pressure to cultivate more marginal (and often more fragile) environments; and higher productivity reduces poverty through lower food prices and increased employment opportunities.

THE ROLE OF ENVIRONMENT (E)

CIMMYT is making an increased effort to characterize maize and wheat production environments. This work is important for understanding sustainability challenges and to better target possible solutions. At CIMMYT we have long practiced the use of mega-environments to guide plant breeding.

THE ROLE OF MANAGEMENT (M)

Improved on-farm management, combined with robust, highly productive crop varieties, is likely to make the biggest contribution to agricultural sustainability in the coming decade. Five key interventions will be the foundation for sustainable agriculture in many parts of the world: crop nutrition, soil organic matter, crop rotations, soil tillage, and integrated pest/weed management.

THE ROLE OF PEOPLE (P)

If sustainable intensification of agriculture is to be achieved, far greater emphasis must be given to an effective combination of farmers' traditional knowledge with the contributions of science. Just as sustainable agriculture requires a new research paradigm, it also requires a new paradigm for involving people – the research-adoption continuum, which includes research, extension, industry, and farmers. In this continuum, all key partners have a role in the process, from priority setting to adoption.

BRINGING IT TOGETHER

In working along the research continuum towards farmers' adoption of sustainable systems, three challenges present themselves. (1) A range of techno-

logies must be integrated at the farm level. (2) There must be an effective and efficient way to “scale up” from individual research sites. This issue is particularly important for CGIAR centers working ecoregionally. (3) Key information must be developed and disseminated among all partners if they are to contribute effectively to sustainable farming systems.

The tools of modern science show significant potential to meet these challenges. Computer simulation models, GIS, and user-friendly information systems are key elements of research for sustainable intensification of agriculture. Aside from helping to develop risk management strategies at both the farm and national levels, these tools are also the most effective means of extrapolating information in time and space—that is, in addressing the issue of how to “scale up.”

ACHIEVING IMPACT

To truly address the GxExMxP paradigm, we need strategic partnerships, and as partners, we must bring to the table all available and appropriate technologies. We know that “business as usual” will not achieve sustainable intensification of agriculture in farmers’ fields. CIMMYT has changed in ways that build on its strengths in G while giving greater emphasis to ExMxP. We seek to build strong alliances with partners who have strengths in these strategic areas—be they national research systems, advanced research institutes, nongovernmental organizations, the private sector, or other international centers. (The full publication of Achieving Sustainable Intensification in Agriculture is available from CIMMYT publications.)

IITA PIONEERS USE OF AFRICALINK

The U.S. Agency for International Development (USAID) has called IITA a “pioneer” for using the Internet in USAID’s AfricaLink program to connect national agricultural researchers in Africa with the resources of the Institute’s library and international staff.

The pioneering event began when Jack Reeves, head of IITA’s Information Services Program, sent a short message to the National Agriculture and Animal Research Institute (NAARI), Namulonge, Uganda, to test a recently installed high-frequency radio link with NAARI. The link connected NAARI to the national telephone system, in Kampala, and through an Internet service provider (ISP) to the Internet and thereby the world.

A reply soon came from the NAARI: “Thanks for the congratulatory message. Indeed, we have gone on E-mail. You are welcome aboard the information superhighway with NAARI.—Innocent Rugambwa, librarian.”

“I was thrilled when I received the message. A line from ‘Casablanca’ came to mind: This looks like the beginning of a beautiful friendship,” Reeves said.

He immediately initiated a test to demonstrate AfricaLink’s potential.

“The first thing I did was to propose to Innocent that NAARI scientists, through her, could call upon the services and resources of IITA such as the library and international staff,” he explained.

Requests soon began traveling in. The most sophisticated test was transmitting NAARI texts and graphics from journal articles archived in IITA’s library. A request came for copies of pages from seven publications.

“We knew that we would have to find solutions to file conversion and compression, to enable us to optimize file sizes to the absolute minimum, while retaining all relevant information. Tables, equations, and figures were our focus. Through experimentation with file formats, and acceptable reduction of quality, a document’s file size can be reduced by 90 percent,” explained Paul Philpot, IITA’s Multimedia Consultant.

Within 3 hours of receiving the request, the information was ready for sending as attachments to NAARI via CGNET.

And the rest is history. Requests continue for information and expertise.

“I hope that our success will spur use of the Internet and E-mail as connectivity becomes available to more national agricultural research systems in Africa. AfricaLink is potentially revolutionary,” Reeves said.

In East and Central Africa, AfricaLink is implemented by ICRAF, which also provides the wireless communication for Namulonge in Uganda.

BED PLANTING SYSTEMS

Working in collaboration with Mexican researchers and farmers, CIMMYT has developed bed planting systems for wheat that reduce the ecological impact of wheat cropping in irrigated environments. The system was originally developed in Mexico's Yaqui Valley, where more than 90 percent of the farmers have adopted the practice.

In the system, farmers plant wheat on top of raised beds that are usually superficially reshaped for sowing the next crop. Residues may be incorporated



CIMMYT Scientist

during reshaping or chopped and left on the soil surface. Irrigation is applied through the furrows between the beds, which greatly enhances water conservation and drainage.

The great benefit for wheat production resulting from bed planting is the tremendously enhanced field access, which facilitates controlling weeds and other pests, handling nutrients, reducing tillage, and managing crop residues.

Researchers at CIMMYT and institutions, such as Punjab Agricultural University, are currently assessing the system's suitability for other irrigated wheat-producing areas of the developing world—for example, the Indian Punjab.

With raised beds, farmers can tailor nitrogen applications to suit their production goals and satisfy the crop's nutrient needs. If nitrogen is applied just when the wheat plant starts to pull it rapidly from the soil, yields increase, grain protein content improves, and the grain's nutritional value is enhanced. Researchers have also determined that by applying nitrogen at certain times, the amount applied can be reduced and less nitrogen is wasted through "leakage."

Yaqui Valley farmers have mainly adopted bed planting, because the system reduces production costs. In the Valley, the system has reduced costs by about 30 percent.

In northwestern India, wheat farmers face two major constraints: weeds and lodging. Bed planting can contribute to solving both problems.

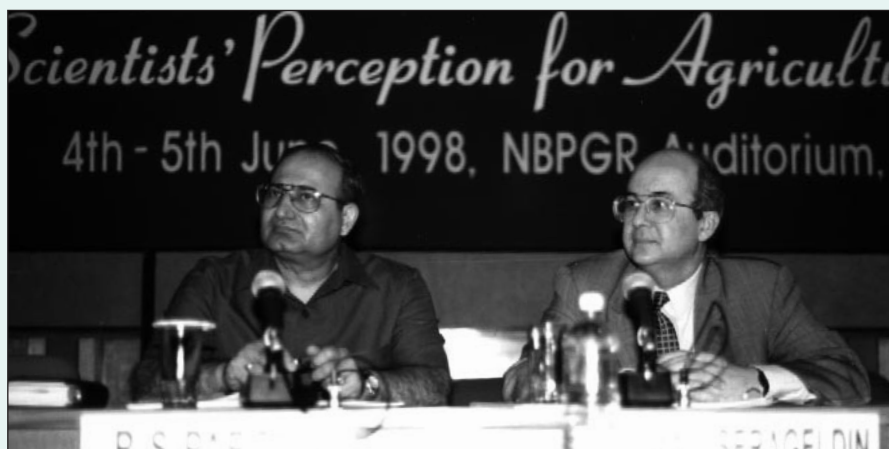
The distinct ecological benefits of bed planting are particularly relevant. The system helps reduce the negative impact of wheat farming on the environment by improving water use efficiency and conservation, reducing the need for applying herbicides, helping to control erosion, reducing the amount of nitrogen that "leaks" into the environment, providing environmentally friendly options for managing crop residues, reducing soil compaction, and bettering soil physical structure over time.

The new system requires specifically designed machinery. In Mexico, farmers, researchers from national agricultural research systems, and CIMMYT scientists have developed prototype equipment for forming and reshaping beds and controlling weeds between the beds. In the Indian Punjab, a local manufacturer has built a prototype low-cost planter that plants three rows of wheat on the beds at the same time as the beds are formed. If it becomes widely available, farmers in the region may find it easier to adopt bed planting.



Bed planting in India

MEETING DISCUSSES VISION FOR INDIAN AGRICULTURE



Ismail Serageldin, CGIAR Chairman, was the keynote speaker at the National Academy of Agricultural Sciences' brainstorming session on "Scientists' Perception for Agriculture -2020."

The meeting, held in New Delhi this summer, attracted many of India's top agricultural scientists and policymakers. Mr. Serageldin briefed the audience about the spectacular developments taking place in biological sciences, and their potential to transform agriculture. He noted that the private sector is making phenomenal investments in biotechnology—\$8 to 9 billion annually in the United States alone and many agriculture-related breakthroughs are occurring within a proprietary science regime. Extensive patenting laws, which

protect the outcome of these efforts in terms of products and processes, have profound consequences for 'public goods' type research in which products are available freely. Moreover, American courts are defining the rules of the game—regarding sharing knowledge, products, processes, genes, and germ-plasm—raising the specter of 'scientific apartheid' where developing countries run the risk of being locked out of the benefits of modern science.

Mr. Serageldin called for a new 'private-public' compact where the best of cutting-edge science could be applied to staple food crops of developing countries. The need is to find imaginative ways of developing constructive and equitable partnerships among the private and public sectors, national and international programs,

farmers, and civil society. He cautioned policymakers and researchers that unless they mobilize science for the benefit of the farming community, it would spell the difference between nations facing misery or well-being.

In a sobering assessment, Mr. Serageldin noted that the challenges to the agricultural sector and achieving food security are formidable with 840 million people hungry, 2 billion malnourished, and the environment under assault. Modern molecular sciences offer considerable promise, but also raise a complex mix of issues—ecological, ethical, legal, and social—that must be confronted if the products of biotechnology are to be safely deployed in the service of humanity.

NEW DIRECTOR GENERAL FOR IRRI

Dr. Ronald P. Cantrell is the new Director General of IRRI. Dr. Cantrell, head of the agronomy department of Iowa State University, is a plant breeder with extensive experience in international agricultural research. After receiving degrees at Texas Tech in agronomy and Purdue University in genetics and plant breeding, he led a farming system project in Burkina Faso from 1982 to 1984. "I'm not sure that in the very brief period of time I had in West Africa, I contributed much," he said in a recent interview. "What I gained was an awareness and a growing interest in international research for the poor people of the world."

When asked if he would like to direct CIMMYT's maize program, the decision was easy: "It seemed really appealing to me, because I thought the international centers were capable of doing some things that I didn't see being done through the university system." He was at CIMMYT from 1984 to 1990 before joining Iowa State's respected agronomy department.

IRRI's new director acknowledges that it's a big change from cattle ranching in Texas, or even maize improvement in Mexico or Iowa, to the grain that provides food energy for a quarter of humanity. Yet, producers of rice face similar goals and problems as other farmers. "It doesn't matter whether you're growing maize in Latin America or sorghum in India or Africa or rice in the Philippines or China: What subsistence farmers want to do, and what their goals are, are pretty much the same," says Cantrell.



Dr. Ronald P. Cantrell, Director General, IRRI

This similarity is underscored by the new technologies now available to researchers. "We're learning through a lot of the new molecular tools that we have so much in common among the various crops. . . We have the tools now to go in and tag genes and transfer them to different material, to incorporate the gene into varieties. Those are tools we haven't had in the past. It's been very difficult to utilize what people call 'exotic germplasm,' but now you can identify genes that you want to transfer that are needed in your elite material, as opposed to our more traditional way of making crosses and visibly selecting in the field." The new technologies won't supplant classical plant breeding methods, "but they are going to amplify that work and make it better."

The new tools couldn't have arrived

at a better time. Population increases are accelerating demand for cereals just as analysts are detecting what they call a disturbing plateau in yield. Cantrell does not feel that agricultural research has reached the upper limits in rice production, but rather that the rate of production increase is slowing—understandable in light of the rapid initial gains of the early Green Revolution years.

"But these new tools are going to allow us to pick up that rate of progress. Likewise, they're going to allow us to incorporate more qualities like native resistance and reduce the dependency on chemicals. And there are gains that can be made from the agronomic side, new tools from the remote sensing field like devices that will measure the reflectance of light on plant leaves to give you an indication of nutrient levels . . . All this sounds futuristic, but it's happening very rapidly in the developing world, and it's going to be important for IRRI to know what they are and to see if there are applications for small-farmer conditions."

At the same time he is concerned with rice yield and the crop's environmental friendliness, the new director general will preside over IRRI at a time of significant change. As residents of the developing world raise their standard of living, Cantrell thinks, they will view rice less as a commodity and more as a source of specialized products. "We'll need to do research to change that rice kernel to provide the products that the consumer wants," he says. "I'm really looking forward to the challenge." 🌱

MESSAGE

FROM

THE CHAIRMAN

Continued from page 1

additional tool in the world's continuing efforts to eliminate poverty and hunger, while protecting the environment. Stakeholders reviewed the state-of-the-art both within and outside the CGIAR System, and discussed the needs and opportunities for CGIAR programs and investment in biotechnology research. From that beginning we intensively examined the substance of the issues and, finally, agreed at MTM98 on a number of action-oriented propositions.

We have agreed on the potential importance of biotechnology as an instrument to help the poor and the environment, although we reject the notion that it is some kind of magic bullet. Whatever we undertake will be within the ambit of our ethical principles, and with necessary precautions to ensure safety. Up to now, this promising aspect of agricultural science has been very much a part of the commercialization of science. Henceforth, the mobilization of its potential for public good-related research will be enhanced. We have clarified our stand and the CGIAR centers' current practice on genetic resource management, collaboration with the private sector, patenting and other important issues.

Our deliberations and decisions have, as well, reaffirmed the scientific credibility of the System. Thus, for many

reasons, all of us—including our partners and beneficiaries—can find great satisfaction in what was accomplished.

Our future actions will have to be elaborated in alliance with many partners. Since MTM98, the World Bank has already brought together a number of our partners in an important workshop on "Intellectual Property Rights (IPR) in Agriculture." It is noteworthy that during

"We must ensure that our voice and views, on behalf of the poor and the environment, are heard in the multiplicity of fora where discussions are shaping the basis of a new global regime." *Ismail Serageldin*

the course of the workshop participants from two national systems, Embrapa (Brazil) and ICAR (India), both CGIAR members, declared their strong interest in carrying out analysis of strategic issues concerning technology innovation, including IPR in the development of agriculture.

These and related issues will be discussed on numerous platforms, for instance at meetings of the Conference of Parties of the Convention on Biological Diversity, and the World Trade Organization. We must ensure that our voice and views, on behalf of the poor and the environment, are heard in the multiplicity of fora where discussions are shaping the basis of a new global regime.

FACING THE FUTURE

How the CGIAR System functions, the research agenda supported by the Group and implemented by the centers, and numerous connected questions will receive common focus in the forthcoming report of the distinguished System Review Panel led by Maurice Strong. We await the System Review report with great anticipation, expecting the wisdom of the panel to guide us as we confront the future. We stand ready to adapt as needed in the light of its recommendations.

Among the problems that need resolution is an erosion of support for official development assistance (ODA) in many countries of the industrialized North. The combined ODA of countries belonging to the Development Assistance Committee (DAC) of OECD has declined consistently in recent years. It dropped from \$58.9 billion in 1995 to \$55.5 billion in 1996, and to \$47.5 billion in 1997. The aggregate ratio of ODA to GNP in DAC countries, similarly, has dropped from 0.27 percent (1995) to 0.25 percent (1996) to 0.22 percent last year. Only four countries—Denmark, Norway, the Netherlands and Sweden—met or exceeded the target adopted at the UN of a 0.7 percent ODA to GNP ratio.

This is a trend that cannot be ignored by the CGIAR, whose contributions are from ODA budgets. We need to be creative, to explore all new avenues for funding, ever vigilant, and re-double our resource mobilization effort. In this connection, independent, impact evaluation is an essential instrument of confidence building in the ODA community, and needs to be strengthened.

Scientists predict that climate change will result in increased weather extremes (storms, floods, and droughts), loss of biodiversity in tropical forests, loss of fertile coastal lands, increased incidence of pests, and other changes. This could have significant implications for the work of the CGIAR. Agricultural production throughout the world could face enormous difficulties as a result of global warming. In addition, agriculture is a significant contributor to anthropogenic sources of greenhouse gases and is responsible for about 70 percent of the total amount of methane and about 90 percent of all nitrous oxide. Thus, agricultural research could potentially contribute to mitigation strategies that reduce emissions.

At MTM98, Dr. Robert Watson, Chair of the Intergovernmental Panel on Climate Change (IPCC) and Director of the World Bank's Environment Department, provided an overview of the latest scientific findings on climate change and the significance for forestry and agriculture. Given population growth, economic growth, and taking into account energy prices and the availability of new energy technologies, scientists project that carbon dioxide concentrations would increase from 360 to 500 parts per million by the year 2100. According to computer climate models, temperatures will change between 1 and 3.5 degrees (centigrade), and sea level will rise between 15 and 95 centimeters.

CLIMATE CHANGE EXPERT SPEAKS AT MTM98

During his presentation, Dr. Watson explained how climate change could have severe consequences for agricultural systems, forestry systems, human health, and ecological systems. Although global agricultural production would be maintained, there could be significant regional effects, with reduced production in the tropics and subtropics, where many of the world's poorest live. Climate change experts predict increased risk of hunger and famine in Sub-Saharan Africa, South, East and Southeast Asia, and the tropical areas of Latin America as well as some Pacific Island nations. The incremental costs of adaptation could burden developing countries and analysts are uncertain about developing countries' capacity to adapt in the face of projected population growth.

According to Dr. Watson, a number of mitigation options exist for agriculture and forestry. Substantial amounts of carbon can be sequestered or conserved in

the forestry sector over the next 50 years by slowing deforestation and establishing tree plantations. Agricultural practices that can reduce greenhouse gases include the following: altered management of agricultural soils and rangelands; improved efficiency of fertilizer use; restoration of degraded agricultural lands and rangelands; methane recovery from storage of manure.

"We need to think through approaches, not only in the energy sector, but also in land management, of how to sequester carbon more effectively both in above-ground biomass and forest and, and below-ground biomass in both agricultural systems and forestry systems," Dr. Watson said. He invited and encouraged CGIAR scientists to work in partnership with the IPCC on these issues. The IPCC, an international body of 2,500 scientists from around the world, was created by the World Meteorological Organization and the UN Environment Programme to provide authoritative global information on climate change.

The CGIAR Technical Advisory Committee (TAC) is currently overseeing an assessment of ongoing CGIAR work that relates directly or indirectly to climate change mitigation and adaptation. A report by Dr. Alison Withey, who is currently working with the U.S. Agency for International Development will be discussed at TAC's September 1998 meeting.

ANNOUNCEMENTS

- Uganda has joined the CGIAR, thereby increasing the total membership to 58, and the number of developing country members to 20.
- Amir Kassam from the TAC Secretariat will join WARDA in September as Deputy Director General of Programs.
- Gordon MacNeil from the CGIAR Secretariat has been appointed Director of Finance at IRRI.
- Guido Gryseels has been appointed Executive Secretary of the Impact Assessment Evaluation Group.

The CGIAR had a presence at the IFAD "From Hope to Harvest" exhibit, which was held at the U.S. Capitol in Washington, D.C., this summer. The exhibit offered viewers an opportunity to see how innovative and sensitive collaboration between all sectors of society can make a difference in combating hunger and rural poverty.

Dr. Dharmawansa Senadihira, a distinguished plant breeding and genetics scientist from IRRI, was killed in a bus accident in Bangladesh on July 7, 1998, where he was attending an international conference. Dr. Senadihira was from Sri Lanka and had recently been selected as recipi-

ent of the Fukui International Koshihikari Rice Prize for outstanding achievements in rice cultural development in the region. He will be sorely missed. Dr. R. K. Singh, IRRI, and Dr. Medan Dey, ICLARM, were also injured in the accident.

- CIP has joined forces with the Swiss Development Cooperation and the Ministry of Agriculture of Bolivia and its National Potato Research Program to create a new research foundation, PROINPA (Promoción e Investigación de los Productos Andinos). The foundation is dedicated to promoting and researching Andean crops in Bolivia.

AWARDS

JOHN RYAN RECEIVES AWARD FOR SOIL RESEARCH

John Ryan of ICARDA received the International Soil Science Award from the International Soil Society of America for his work in dryland areas. As the head of the soils laboratory at ICARDA, Dr. Ryan is responsible for soil test standardization throughout the West Asia-North Africa region. He has a career publication record that includes seven books and over 250 journal articles, proceedings, and abstracts to his credit. Dr. Ryan contributes to regional and international meetings and serves as a reviewer for several journals.

IPM TEAM WINS SECOND MASHLER AWARD AT ICRISAT

The second Doreen Margaret Mashler Distinguished Scientific Achievement Award was presented at ICRISAT

to a multidisciplinary team that contributed to the "Development of Integrated Pest Management in Groundnut with Special Attention to Defoliating Insects." Scientists from ICRISAT, the national agricultural research programs of India and Vietnam, nongovernmental organizations, farmers, and media representatives from Andhra Pradesh made up the team.

GIRO ORITA HONORED BY THE EMPEROR OF JAPAN

A long-term ICARDA scientist, Dr. Giro Orita, has been awarded the Order of the Rising Sun with Gold and Silver Rays, the highest decoration in Japan for Japanese experts working overseas, by His Majesty Emperor of Japan Akihito. A Japanese veterinarian, Dr. Giro Orita rendered outstanding service to animal health in Syria for 34 years. In 1983, Dr. Orita began working with ICARDA on the health of sheep and goats. Although he retired from ICARDA in 1990, he has retained a strong link as an Honorary Senior Scientist.

THE CGIAR

CGIAR Chairman

Ismail Serageldin

CGIAR Executive Secretary

Alexander von der Osten

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International and Regional Organizations

African Development Bank, Arab Fund for Economic and Social Development, Asian Development Bank, European Commission, Food and Agriculture Organization of the United Nations, Inter-American Development Bank, International Development Research Centre, International Fund for Agricultural Development, Opec Fund for International Development, United Nations Development Programme, United Nations Environment Programme, World Bank

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