Challenges for IRRI: a cross-section of opinions

In a departure from presenting excerpts of a single pioneer interview, this installment presents a diverse cross-section of responses to one question: As IRRI approaches its 50th anniversary in 2010, what do you see as the Institute's greatest challenge? Interviews were conducted between June 2006 and June 2009. More will be added online as interviews continue

Randy Barker, IRRI agricultural economist and head, Economics Department, 1966-78; acting head, Social Sciences Division, 2007-08

When I first came to IRRI in 1966 just before IR8, people at that time looked at IRRI and said, "that's a nice set of buildings," but they didn't think the Institute would ever produce anything. There was a real skepticism about whether IRRI would ever amount to much. Joining IRRI was like buying into a stock that all of a sudden took off.

In the early days, the IRRI mandate was fairly simple and straightforward, increase rice production in Asia, and so the focus and the priorities were there. Since that time, we've gone from food security to environment and poverty and other areas. So, in many ways, the mandates of IRRI and of the other centers tended to expand.

The real challenge now is being sure that IRRI operates in the area where it has the greatest comparative advantage. For example, the challenge for upstream work is to have the appropriate connections with the advanced institutions for developing biotechnology research. When going downstream, this means, in part, the ability to transfer some of that biotechnology expertise and focus it on those areas that will complement what the NARES [national agricultural research and extension systems] are doing.

Nyle C. Brady, IRRI director general, 1973-81

I think IRRI needs to make effective use of biotechnology and other modern research tools to help the plant breeders develop rice lines that efficiently utilize plant nutrients, that tolerate adverse conditions such as drought, and that are resistant to insects and diseases, thereby reducing the need for pesticides.

To do this, IRRI must have linkages with scientists in both the developing and the more developed countries. This is an advice which the whole CGIAR [Consultative Group on International Agricultural Research] system could accept. I recognize the political reasons why this is difficult because some countries don't want biotechnology to be used for this purpose. But the developing countries need the improved crops much more than we do in the U.S. So, I think this is the direction in which IRRI and other such centers should and could go.

IRRI must also continue to push what it has been doing lately—more after I left than when I was there—to recognize the consequences of what we do to the environment in terms of pesticide use—and fertilizer use, that is, nitrogen getting into the water causing troubles later on. This is being done, but I think even more can be done. I think this is an opportunity for IRRI to develop high yields of quality rice in such a way that the soil, water, and atmosphere will not be adversely affected.

Ronald Cantrell, IRRI director general, 1998-2004

Clearly, it is the funding issue. What comes with the funding uncertainty is creating some difficulty in hiring staff. IRRI has been able to continue to hire good international staff. But there is uncertainty caused by restricted core funding and the threat of the loss of all USAID funding [in July 2008]. If you are a bright young scientist just out of graduate school, do you want to take a chance on starting your career there? "There" meaning not necessarily IRRI but "there" meaning in that kind of system. So, unless there are some things that will stabilize the funding, it may create some problems for IRRI in the future of being able to hire international staff. I think that is the greatest challenge that IRRI will face. The culture of the Institute is rich; it's great. I just think it needs to have a more stable environment.

Kwanchai Gomez, IRRI head statistician, 1968-93; liaison for coordination and planning, 1993-96; consultant, 1997-98

I think IRRI's greatest challenge is to define clearly the kind of contributions it still can make to the rice world. IRRI cannot just keep doing the same things it did at the start. IRRI has come a long way [47 years as of the time of the interview] and the rice problems of the world have changed drastically. IRRI must define what its present goals are; who are its clients and what are their expectations? What does the rice world need and what and how can IRRI contribute?

It's true that IRRI is an aging institution, and it may not be easy to re-define its goal, its mandate, and adapt new strategies and directions at this point in time. But, unlike old people, it is still easier to revive and renew an old institution. And I think IRRI should be able to find the way.

IRRI has a new strategic plan, *Bringing hope, improving lives*. Some see it simply as a patch-up job of what it is doing now or maintaining a status quo. Whenever a strategic plan is developed purely by the people from inside the institution, it carries too much baggage; it's heavy. Who will work on a strategy and work plan that will put them out of their jobs tomorrow? Nobody, of course! I myself had worked closely with the first IRRI strategic plan; I should know.

Ronnie Coffman, IRRI plant breeder, 1971-81; currently chair, Department of Plant Breeding & Genetics, and director of International Programs, Cornell University

Global warming and the rise of sea level could prove to be the greatest challenges for IRRI, for plant breeding, and for rice science in general because, as you know, the majority of rice is found in the large low-lying river deltas of Asia. The Ganges, the Brahmaputra, the Irrawaddy, the Mekong, all those big deltas are, in some cases, only a few inches above sea level. So, right now, the minimum prediction for sea-level rise is a conservative projection of 38 inches by the middle of this century. This will obliterate places like Bangladesh, West Bengal, and the Mekong Delta.

This is huge. So, what will happen, slowly, or maybe not so slowly, is that brackish water will get pushed up the rivers and affect the growth of the rice. And you get less and less fresh water coming down because glaciers are melting in the Himalaya at the rate that people can't believe. So, you're going to get a scarcity of fresh water and then the rising sea level that pushes in the brackish water. That's going to push the cultivation of rice way back in a gradual, or maybe not so gradual, manner. So, salinity tolerance might offer some help. But I think the global warming and the resulting rise in sea levels—and remember that 38 inches is the minimum prediction; others are predicting more and faster—that portends a real crisis in rice cultivation.

M.S. Swaminathan, IRRI director general, 1982-88; currently chairman of the M.S. Swaminathan Research Foundation

There are challenges and I'm sure IRRI is aware of them as it modifies its mandate. During its first decade [1960s], IRRI's challenge was to improve productivity. The second decade had the challenge of putting it into a farming systems background. During my decade, we had the challenge of mainstreaming considerations of ecology and equity in technology development and dissemination and also building national rice research institutions, including one in the Philippines.

IRRI's greatest challenges today are against the backdrop of globalization. The UN Millennium Development Goals (MDGs) present a challenge for IRRI because, for 40% of the world's population, rice is a staple. So, the very first MDG, reducing hunger and reducing poverty, depends greatly on IRRI's work, along with its national partners. So, there is a great responsibility. Then, of course, MDG number 3 is gender equality and empowerment of women, where again IRRI has been the flagship of the gender equity movement in the world, the first scientific institution, which started strong gender mainstreaming of its work. I would say the number-one challenge is this new vision for IRRI, which places poverty alleviation and hunger elimination at the top of its agenda.

Another challenge is dealing with the public/private partnerships in an IPR [intellectual property rights] environment. As they commonly

say, the "Green Revolution" was a public-sector enterprise, while the "Gene Revolution" is a private-sector enterprise. So, how are we going to develop this new kind of partnership between the public and private sector without compromising IRRI's commitment to help poor farmers? Social inclusion for access to new technologies should be the bottom line of IRRI's technology dissemination policy.

Tom Hargrove, IRRI editor and later head, Communication and Publications Services, 1973-91; most recently coordinator of information and communications, International Center for Soil Fertility and Agricultural Development

IRRI's greatest challenge is to continue to do the work it is doing and keep the money coming in so that it is able to carry out the plan. The world is changing so much right now that we don't have any idea of what really is going to happen. There's obviously not just a food crisis, which has been building up for a long time. Then, these different factors hit all at once: a decrease in funding for research and the demand for food and fuel with 30% of the U.S. corn crop going into ethanol. At the same time, Indians and Chinese are achieving higher incomes and they want to drive cars too and, as incomes rise, they eat less rice and want more meat.

Of course, fertilizer (nitrogen, potassium, and phosphorus) is essential to the nutrient production needed to make the ethanol and to feed the livestock to accommodate the changing food habits of China and India. All of these things are coming together. A farmer in Togo or Mali in West Africa who grows rice or any other crop, a couple of years ago, had to pay twice what a farmer in Iowa has to pay for a kilogram of urea. Now, with the price of fertilizer doubling, tripling in the United States, I think it's going to be almost impossible in Africa. This could be one of IRRI's greatest challenges in Africa if indeed there's to be an African Green Revolution.

Gurdev Khush, IRRI rice breeder and principal scientist, 1967-2001; currently adjunct professor, University of California, Davis

As the national programs have become stronger, IRRI has started putting emphasis on certain areas where it has a comparative advantage, such as in molecular biology and biotechnology. IRRI stopped naming varieties because the national programs have become strong enough so we only need to supply them with germplasm. The challenge will continue for IRRI to find new techniques, which can help the national programs.

In breeding, I think we have to continue to find approaches to increase yield potential and to identify new sources of disease and insect resistance so that they can be supplied to the national programs. Also, IRRI needs to use the new genetic engineering technology. The environment for accepting genetically modified crops is not as good as it should be, but eventually, I think, in a few years, the national programs, the farmers, and the NGOs will start accepting genetically modified materials. Molecular biology techniques to use include molecular marker-aided selection and identifying QTLs [quantitative trait loci] for difficult traits, such as drought. So, the challenge is to work with national programs to incorporate all these techniques into breeding approaches. This should lead to rice improvement efforts that focus on increasing the yield potential and developing varieties with novel traits.

S.K. De Datta, IRRI principal scientist and head, Department of Agronomy, 1964-92; currently associate vice president for international affairs and director of the Office of International Research, Education, and Development at Virginia Polytechnic Institute and State University

When I was at IRRI, I didn't realize until I left how inward-looking we were. Somehow, we felt that our donors will continue to support us no matter what we do. I think IRRI scientists have to go beyond the inward-looking posture to communicate and network with the best minds all over the world and to collaborate much more aggressively. Otherwise, down the road, I can see that we'll have problems garnering funds.

What I have noticed over the last 5–6 years is that IRRI is not making headlines in the United States, when, 5, 10, or 15 years back, IRRI news was major news here in the *Washington Post* and the *New York Times*. I don't see any breakthroughs coming out, which are hitting the headlines. [At the time of the interview on 25 June 2006, this was perhaps true, but now, in 2009, IRRI is routinely making headlines in the U.S. and around the world; see irri.org/media/articles.all.asp.] We need to generate more relevant knowledge and technology and to communicate with the U.S. and other industrial nations so they feel excited about IRRI's research and support it on a sustained basis.

IRRI must communicate its new knowledge and technology, which will help the next generation of food producers and consumers around the world. The primary beneficiaries are the developing regions, but let's not forget that the developed regions are our partners and we need to do a better job communicating with them as to why they need to support IRRI and other CGIAR centers. So, I consider that as a big, big challenge because resources are shrinking all over the world.

Robert Herdt, IRRI economist, 1973-83, head of the Economics Department, 1978-83; later director, agricultural sciences, and vice president, The Rockefeller Foundation; currently adjunct international professor of applied economics and management, Cornell University

I think IRRI's greatest challenge is how to turn over management and responsibility to the Asian countries that are the primary beneficiaries. There are many hundreds of millions of people in Asia who are still in need of the benefits of new technology and higher productivity, but there are also hundreds of millions in other countries in the world who are in a lot worse shape. Rice research is at a high level of development in Asia. This is something that Asian countries should take more responsibility for. If they don't feel like there is enough value to them having a regional research institute, then I personally don't believe the rest of the world should be supporting the whole thing. So, that's the biggest challenge.

Klaus Lampe, IRRI director general, 1988-95

I guessed that you might ask such a question. I recall the very first draft of a new strategic plan, developed in 1994, with the title IRRI towards 2050. It was rejected in the committee and by the board because the horizon was seen to be by far too long. Of course, nobody knew if IRRI would exist in 2050.

However, in my view, there are five functions, which I stressed at that time and still valid for IRRI in 2050: (1) to house the base collection of the world's rice germplasm and to perform the many evaluation, research, preservation, and service functions that this responsibility entails; (2) to collect, evaluate, select, and make accessible information on current rice research and development programs, rice and rice-related research, and global rice research resources—human, financial, and physical; (3) to retain a response capability, which can catalyze the use of those resources through internationally recruited teams working on topics of supra-national importance; (4) to organize and convene conferences, task forces, seminars, and meetings to facilitate the exchange of information and to focus the application of knowledge on the resolution of emerging problems; and (5) to define research needs that can be taken care of by existing research centers worldwide, promote funding, and harmonize the implementation.

Given its mandate, IRRI's future, its lifetime, will largely depend on its successful search for excellence in all aspects of its endeavors: excellence in research planning and implementation; excellence in human resource management, cooperation, and collaboration; excellence in efficiency and effectiveness at all levels; and excellence in its financial resource management and not to forget in public awareness, creating conducive donor-, partner-, client-, and target-group relationships.

Gary Toenniessen, managing director, The Rockefeller Foundation, and long-time IRRI collaborator

The biggest challenge for IRRI today is that many of the national programs that it is assisting are also becoming very strong. IRRI needs to really find its niche in Asian situations, in which the national programs are now quite capable as well. I think there really is a niche for IRRI. It's doing those kinds of things that can be shared across all of the rice research institutions in Asia or worldwide and that wouldn't likely be done by a national program or, if they were, that they wouldn't get shared. IRRI needs to be a coordinator, a source of knowledge or information, and continually a source of breeding lines, which have traits that have been generated through advanced science done throughout the world that no national program can probably access.

The new Sub1 lines that have submergence tolerance are a good example. The initial real work on that was done at the University of California, Davis. Not only was the technology transferred, but the person who did the work, David Mackill [IRRI senior scientist; see *Scuba rice: stemming the tide in flood-prone South Asia* on pages 26-31 of *Rice Today* Vol. 8, No. 2], was transferred as well from California to IRRI. And so, the next phase in that process was done at IRRI and all submergence-tolerant materials are now being shared with the national programs. I really do think there's an important role for IRRI to be the conduit by which and through which the best science in the world gets applied to rice research and then shared with the national programs in Asia.