NORTH-SOUTH RELATIONS

Lopsided Partnerships Give Way to Real Collaboration

LOS BAÑOS, THE PHILIPPINES—When the Ford and Rockefeller foundations joined hands in 1960 to establish the International Rice Research Institute (IRRI) here, in the heart of this country's rice bowl, they designed a well-appointed, self-contained facility with its own laboratories, test fields, housing, and recreational opportunities for the dozens of First World scientists hired to lead the effort. The foundations had little choice: The Philippines' own scientific infrastructure was too weak to offer much help.

By 1977, when the International Center for Living Aquatic Resources Management (ICLARM) set up shop in Manila, the country's scientific capabilities had improved to the point where a couple of floors of downtown office space could suffice for its administrative needs. That's because the center's scientists do most of their research in labs across the country and around the region—working with another Philippine research institute to improve the tilapia fish genetically, for instance, or with the James Cook University in Townsville, Australia, to cultivate giant clams.

Jump ahead another generation, to the 1993 founding of the Center for International Forestry Research (CIFOR) in Bogor, Indonesia, and the trend is even clearer. With regional offices in southern Africa and Latin America, CIFOR's 35 scientists spend most of their time on the road, collaborating with 800 scientists around the world.

D. NORMILE

Active alumni. F. A. Bernardo cites IRRI's training role.

These three centers—all members of the Consultative Group on International Agricultural Research (CGIAR), a global network supported by 42 countries—reflect both the old and the new waves of international collaboration with scientists in the region. Such joint efforts have trained local scientists, strengthened their institutions, and helped both earn credibility—and funding—from their own governments. They also provide unique opportunities for outside scientists. But these links can foster dependency on outside sources of funding and isolate researchers from their own governments. And bureaucratic red tape can frustrate the best intentioned collaborations.

In many respects, the CGIAR centers have led the way in helping to build up local scientific capacities. F. A. Bernardo, an adviser to IRRI, proudly ticks off a list of alumni that includes the undersecretary of agriculture in Egypt, the

PROFILE

Keeper of the Keys to Fossil Kingdom

YOGYAKARTA, INDONESIA—Teuku Jacob is the undisputed king of paleoanthropology in a country rich in early hominid fossils. Trained as a pathologist and a physical anthropologist, Jacob has curatorial control of an extensive collection, much of it bequeathed by his mentor, Dutch anthropologist G.H.R. von Koenigswald, who died in 1977. But most of the collection sits locked away in a refrigerated safe in the basement of the institute that Jacob directs at the University of Gadjah Mada. Over the years, Jacob has made the fossils available for brief peeks, but rarely for detailed analysis.

J. MERVIS

Polite advice. Teuku Jacob says "manners are important" in research.

Researchers around the world complain that Jacob's iron grip on the collection has slowed progress in understanding an important chapter of human development. But few are willing to discuss their complaints on the record for fear of repercussions. "When you play on their court, you have to respect their rules," says Sidney Smith, a retired U.S. science attaché in Jakarta. "That's true for all interactions."

The 67-year-old Jacob confesses to being wary of outsiders who seek access to the collection. "We want people for whom anthropology is their life, not just people interested in the famous fossils," he says. "You have to be interested in the country, which is still young and trying to develop its science." Indeed, Jacob has been an eyewitness to that process: In 1950, he was a member of the first class to be admitted after independence to Gadjah Mada, the country's oldest and largest university, and he later moved up the professorial ranks until he became its rector in the mid-1980s. And his patriotism runs deep. As a 19-year-old soldier for the government in exile, Jacob broadcast a passionate message of resistance every Monday night to his comrades fighting to end Dutch colonial rule.

Today, however, Jacob operates on a time scale that harried scientists on a short-term grant may find hard to understand. "Our first inventory was published in the 1960s," he says. "Now we have to rework the whole thing as part of making our own collection." In 1991, he accompanied a skull for a 1-month trip to Paris for analysis by gamma ray spectrometry, "but we're not yet ready to publish the results," he says. Jacob is especially bothered by "pushy Americans, who want to go ahead and work even if you're not there. ... I think that manners are important."

It's not just pushy Americans who raise Jacob's hackles. He confirms that he had a stormy relationship with S. Sartono, a geologist at the Institute of Technology in Bandung, which holds several important hominid specimens. Jacob acknowledges that the rivalry, which lasted for more than 30 years until Sartono died unexpectedly in 1995, stifled collaboration between the two labs. It also forced outsiders to choose sides when working in the country.

Foreign scientists are pinning their hopes for greater access to the fossils on the pair's successors. Jacob received a 5-year extension beyond the mandatory retirement age of 65, but he says he expects Etty Indriati, a faculty member finishing her Ph.D. in bioanthropology at the University of Chicago, to take over most of his lab duties when she returns. She will also need to rebuild the staff, which Jacob notes has shrunk as a result of recent deaths and retirements. In the meantime, Jacob says he will continue working at his own pace. "There's no hurry. Science is continuous, and you learn a bit more every year." –J.D.M.

secretary-general of the Ministry of Agriculture in Indonesia, Laos's Minister of Agriculture, and the head of research for the Ministry of Agriculture in Vietnam. But training is also a component of direct research collaborations. "We've tried to be an institute without walls," says Meryl Williams, ICLARM's director-general. Adds Neil Byron, CIFOR's assistant director-general and an Australian-born natural-resource economist, "We think these long-term alliances are the only way to meet the technological, social, and economic needs of the region."

Follow the leader. But IRRI's influence on scientific development in the Philippines has had its drawbacks, too. For example, it wasn't until 1986 that the Philippines established its own rice research institute to focus on problems particular to its environment. "We had the mistaken notion that there was no need to do rice research because IRRI was here," says William Padolina, secretary of the Philippines' Department of Science and Technology. "We lost a lot of opportunities in the past by not taking advantage of IRRI's presence."

Thailand has also experienced the pluses and minuses of international collaborations. Mahidol University in Bangkok was strictly a medical college until the mid-1960s, when it was given a charter to expand to a full-fledged university. In the early 1970s, using Rockefeller grants, it brought in a number of foreign, primarily U.S., academics on temporary appointments to develop graduate curricula and start up research activities. That focus has remained even after the foreigners left: Mahidol officials boast that their school accounts for more than half of all of Thailand's scientific papers published in international journals.

But Thailand's dependence on U.S. aid, which fueled much of the country's research activities in the 1980s, was made painfully clear when that aid was cut off after a military coup in 1991. At about $30 million annually, it was the largest source of grant support for university researchers, who would have been left high and dry if the Thai government hadn't stepped in quickly with its own money. "That made policy-makers in Thailand realize that for science, you can't depend on the foreign policy of another country," says Yongyuth Yuthavong, director of Thailand's National Science and Technology Development Agency, which was formed in response to that need.

Building up local scientific capacity can help overcome such dependency, and it can also lend credibility to international projects. Notes CIFOR's Byron: "It's better for a group of scientists to go to their government and say, 'We came up with this solution to our problem, as part of an international team of scientists, and we think it should be adopted,' than to say that some outsiders did this and now they are trying to tell us what we have to do." It's even better if a local scientist takes the initiative and sells it to an international organization.

PHOTOS: J. MERVIS

Collective effort. Mien Rifai's mushrooms and a 1906 plant specimen are some of the items being remounted under GEF herbarium project.

Mounting a fresh effort. That's what happened in the case of a $14 million biodiversity project now under way at the Bogor (Indonesia) Herbarium. The 5-year effort to upgrade a 2-million-specimen plant collection, which will also train 50 taxonomists, is being funded jointly by Indonesia and the Global Environmental Fund (GEF), a $2 billion pot of money created by the industrialized nations in 1993 and managed by the World Bank. In addition to remounting and rehousing the specimens, which date back to 1817, information about them is being put into a computer database with a tailor-made search engine accessible to scientists worldwide. "The purpose is to preserve Indonesian biodiversity," says Mien Rifai, former head of the herbarium and now an official with the Ministry of Research and Technology. "In the past, everything was done manually and by memory. Now, it will be available to everyone, and we will have the capacity to do research, too."

Change agent. Daniel Murdiyarso runs climate research center.

Down the road from the herbarium is another transnational project, the Southeast Asian Impacts Center, that has both benefited and been constrained by its international roots. The center, headed by Indonesian meteorologist and forester Daniel Murdiyarso, was established in 1995 with a $2.1 million grant from Australia. It is affiliated with a Southeast Asian regional center on tropical biology and is part of the International Geosphere-Biosphere Program (IGBP), a collection of long-term, global scientific projects.

The center wins points from outside scientists for its willingness to join forces to monitor the impact of global change on terrestrial ecosystems—especially on forestry, agriculture, and natural resources—and to help policy-makers translate those scientific findings into sound policy. "Dan is brilliant," says fire ecologist Johann Goldhammer of the Max Planck Institute for Chemistry in Freiburg, Germany, who leads another IGBP project that monitors the impact of tropical forest fires on the atmosphere and biosphere and is trying to launch a Southeast Asian version of the experiment, called SEAFIRE. "He's open to new ideas, and he's easy to work with. If we had more people like Dan, we'd make a lot more progress."

But the center's reliance on foreign support makes it an outsider on politically sensitive issues—such as land use and sustainable development—that trigger heavy-duty bureaucratic turf wars, notes Goldhammer. And its informal ties to Indonesia's environmental ministry are of little value in such battles, Murdiyarso admits. "The Ministry of Environment is limited to air and water pollution, and it hasn't gotten very involved in global change. And even though the ministry is coordinating Agenda 21 activities [stemming from the 1992 U.N. Earth Summit in Rio], it isn't the implementing agency. There is really no coordinated effort."

Taking time. Making the right connection is vital for an effective collaboration. Typically, outside research projects must strike a chord with local scientists and also satisfy some national need. The plot thickens when the work involves areas of military significance, such as seabeds and coastlines, or national treasures, including coral reefs and fossils. Indonesia can be an especially difficult place to arrange joint research, say many scientists, because of the country's sluggish and often opaque bureaucracy. The problem can become acute if foreign scientists are on a tight deadline.

"It's not hard to get a permit for research, as long as you give us sufficient time—at least 6 months in advance," says Indroyono Soesilo, deputy director for natural resource development at BPPT, the government's chief technology agency. Part of the reason for the delay, agree both local and foreign scientists, is that the agency handling the

BIOTROP/GCTE IMPACTS CENTRE FOR SOUTHEAST ASIA

Reaching for the Sky to Nurture Science

KUALA LUMPUR, MALAYSIA—Mazlan Othman doesn't like it when local newspapers focus on her achievements. But they're hard to ignore. One of only three Ph.D. astrophysicists in the country and a full professor at the National University of Malaysia, she is also the founding director of the National Planetarium and head of the space science division within the Ministry of Science, Technology, and the Environment. She has volunteered, in her spare time, to draft policies to govern the country's fledgling space program. And she's also responsible for overseeing the design and construction of Malaysia's first microsatellite, a 50-kilogram scientific payload to be launched before the end of the year.

So how does this 46-year-old dynamo feel about what she has accomplished since she "discovered $e=mc^2$" at the age of 15 and fell in love with the idea that "the world is so simple and so beautiful"? She pauses to straighten a pile of papers on a messy desk in an office crammed with law books, posters, scientific reports, and other evidence of her activities. Then she avoids the question. "I have a 2 1/2-year-old daughter who wrecks my office," she said during an interview last fall. "But I bring her to work sometimes because I feel guilty about not spending more time with her."

Indeed, even 24 hours is not nearly long enough for Mazlan to do everything that she would like to accomplish. "When I came back [from New Zealand] after getting my Ph.D., I wanted to do astrophysics," she recalls. "But there was no activity here. So I tried to sell the government on the idea of building an observatory." The effort failed, she explains, "because nobody understood what an observatory could do."

That setback led to her first foray into public education. Some 3 years later, she had convinced the Ministry of Education to add a 25-hour block of time on astronomy to the national curriculum. But she didn't stop there. "A planetarium is an obvious way to attract people and increase interest in the subject," she says. A few years later, she was presenting her plans to Prime Minister Mahathir Mohamad, who took a personal interest in the project. "He chose the color and the shape of the dome," she says about the building's distinctive architecture, which allows it to blend in with its neighbors, the National Mosque and the Islamic Center. "He even comes once a month, after hours, to look at the exhibits," she confides.

J. MERVIS

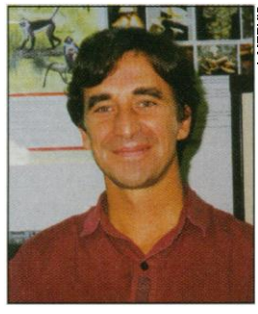
Selling science. Mazlan Othman prods prime minister and the public.

The museum opened in 1994, just in time for Mazlan to begin working on Mahathir's plans to make Malaysia a space-faring nation. The next year, the country signed a deal with a company owned by the University of Surrey in the U.K. to build a microsatellite that would be the first step in training a generation of space scientists and engineers. "It's the first time we will be doing real space science," she says. "And we're already starting to work on the next one, a bigger one with better technology," although the current economic downturn has put a hold on any new projects.

Work on a stand-alone space agency has been delayed for the same reason, she says, and the country's weakened currency has put a big dent in plans to upgrade the planetarium's exhibits and educational programs. And while Mazlan hopes this summer to turn over some responsibility for the planetarium's operations to a newly minted Ph.D., the move may not give her any more free time to spend with her family. That's because officials at the new graduate engineering university would like to hire her as provost (see sidebar on p. 1474). If they do, it will mean one more opportunity for Mazlan to apply her green thumb to nurturing scientific enterprises in Malaysia. **–J.D.M.**

requests, the Indonesian Academy of Sciences (LIPI), must consult with other, more powerful government bodies before a decision is made. And agency officials admit that the process can be frustrating.

"LIPI is not the only actor. And if one member of the committee doesn't agree, then we cannot give our approval," says Suparka, LIPI vice chair and former head of its geotechnology center in Bandung. "And sometimes the decision is not based on rational grounds. I'm a geologist, and 10 years ago I bought a GPS [global positioning system] receiver and showed it to the military. They said, 'Now you can give the exact location of our office to the enemy, so he can target a missile to hit us.' They didn't understand that it was an important scientific tool."



J. MERVIS

In his element. Stuart Davies explores Sarawak's rich biodiversity.

However, another type of threat to a country's national security can cement a collaboration. Raymundo Punongbayan, director of the Philippine Institute of Volcanology and Seismology, proudly points to a hefty volume of the collected papers that resulted from joint studies of the phenomenal eruption of Mount Pinatubo in 1991, done in cooperation with scientists from the U.S. Geological Survey. The collaboration began when the volcano first started rumbling and is still continuing. "They brought state-of-the-art equipment, but we were working together to set it up and interpret the data," Punongbayan says. Volcanologist Chris Newhall, of the University of Washington, agrees: "It was truly a joint effort."

Some foreign scientists have taken collaboration one step further by joining the local institutions with which they have worked. For such hired scientific guns, the natural resources of the area are a major attraction. "I love to be in the forest," says Stuart Davies, a recent Harvard Ph.D. who took a job at the University of Malaysia at Sarawak after completing his thesis on how plant communities in a nearby national park respond to both human and natural disturbances. Davies, who is advising three local master's students, says "There's really no longer any excuse, if there ever was, for our research not to be as good as anybody else's anywhere in the world."

For Davies and others, the long-term goal is to make the local scientific infrastructure as strong as the one in which they were trained. That would bring the region full circle from the days when two philanthropies had to build a research establishment from the ground up. Or as Salleh Mohd. Nor, executive director of TropBio Research, a Malaysian plant biotechnology company, puts it, "Robbing other countries of the best scientists should not be an American monopoly."

–Jeffrey Mervis and Dennis Normile