

ISAAA in Asia

Promoting corporate profits in the name of the poor

October 2000

The controversy surrounding genetic engineering is heating up in Asia, as the transnational food and agriculture industry, worth over \$700 billion a year¹, moves to bring its patented biotechnologies into the region's farmlands. The companies are enlisting the support of a number of international, non-profit, development organizations to promote biotechnology and help to engineer the necessary political and legal landscape for its worldwide adoption. These organizations include the United Nations Industrial Development Organisation, the US Agency for International Development (USAID) and many others. The International Service for the Acquisition of Agri-biotech Applications (ISAAA) is one of the most focused promoters of gene technologies in Asia. Through the formation and support of key local elites, ISAAA is helping carry out an agenda set by transnational corporations (TNCs), in the name of Asia's rural poor.

1. ISAAA's origins

In the 1980s, the Rockefeller Brothers Fund brought together several other financiers to form the Resources Development Foundation in New York. This Foundation subsequently established an International Biotechnology Collaboration Program in cooperation with the Hitachi Foundation, with a mission to transfer biotechnology to the developing world. In 1991, under the guidance of Dr Clive James, former Deputy Director-General of the International Center for Wheat and Maize Improvement (CIMMYT), and with over a million dollars from an anonymous donor, the programme was re-established as an independent entity called the International Service for the Acquisition of Agri-biotech Applications (ISAAA) under the direction of Dr James. ISAAA's sole purpose is to facilitate the delivery of proprietary biotechnologies from the corporate labs of the industrialized world into the food and farming systems of the South.²

The first ISAAA center, the AmeriCenter, opened in 1992 at Cornell University in the US, where ISAAA's most recent Executive Director, Anatole Krattiger³, another former CIMMYT employee, was stationed. ISAAA now has a EuroCenter at the John Innes Centre in the UK, an AsiaCenter at Technova Inc in Japan, an AfriCenter at the regional office of the International

¹ Based on the sales (within the respective sectors) of the top 100 food and beverage companies, the top 10 agrochemical companies, and the top 10 seed companies in the world. Sources: Seymour Cooke Food Research International, "The World's 100 Food and Beverage Corporations", 2000; Agrow, *World Crop Protection News*, April 16, 1999 and September 17, 1999; and RAFI.

² While some of the information below comes from personal communication with ISAAA representatives and individuals associated with ISAAA, the researcher for this paper regrets that ISAAA, and particularly its SEAsia Center, did not or would not respond to many of his inquiries.

³ On August 31, 2000, Anatole Krattiger resigned as Executive Director of ISAAA. The position of Executive Director has now been abolished and split into two: David Alvarez of Cornell University has become the Director of Administration and Gabrielle Persley, an advisor to the World Bank, has become the Director of Programs. Dr Krattiger continues to work in Ithaca, New York, where he now runs his own consultancy firm, bioDevelopments LLC.

Potato Center on the campus of the International Livestock Research Institute in Kenya, and a SEAsia Center at the International Rice Research Institute (IRRI) in Los Baños, Laguna, the Philippines. A LatiCenter is also planned.

Besides the initial mysterious anonymous donor, ISAAA receives support from a number of institutions and biotech companies, including the Rockefeller Foundation, USAID, Novartis, Monsanto and AgrEvo. (See Appendix for current list.) In 1997, ISAAA reported that it had raised over \$13 million for its programs.⁴ The big dollars are matched by high-profile board members, past and present, such as: Robert Fraley, head of Monsanto's agbiotech program; Wally Beversdorf, head of Novartis Seeds' biotech program; William Padolina, former Secretary of the Department of Science and Technology of the Philippines; and Gabrielle Persley, Executive Director of AusBiotech Alliance and advisor to the World Bank. (See Appendix for current list.)

ISAAA's operations

ISAAA's rationale is as follows. Since conventional agricultural technologies cannot feed the growing population, the world needs biotechnology, especially in the developing countries where demographic pressures are most critical. However, because of the enormous costs of biotech research and development (R&D), the technology is almost entirely in the hands of private companies in the North.

ISAAA's mandate and principal objective will continue to be the transfer and delivery of biotechnology products to developing countries, particularly to resource poor farmers, by building partnerships between institutions from national programs in the South and from the private sector in the North.

ISAAA Board and Management Response to the External Review, 1994

The only way to get this technology to the South is to build "global partnerships" between the private sector of the North and the public sector of the South. Such partnerships require "honest brokers", such as ISAAA, that can bring the sides together and help ensure that the partnerships are carried out effectively.

At present, ISAAA targets twelve countries where it aims to fulfill its mission: Indonesia, Malaysia, the Philippines, Thailand, and Vietnam in Asia; Kenya, Egypt, and Zimbabwe in Africa; and Argentina, Brazil, Costa Rica, and Mexico in Latin America.

To create these partnerships, ISAAA sets up technology transfer projects. They cover either tissue culture, diagnostics or transgenics (genetic engineering). While tissue culture and diagnostics involve simpler forms of modern biotechnology, they are seen as "stepping stones" to the more advanced applications. The projects involving transgenics focus on crops that are otherwise ignored by the private sector but which offer "a high probability of success over a short time frame" to demonstrate the effectiveness of these partnerships.⁵ In this manner, all ISAAA projects serve primarily to awaken interest in and commitment to biotechnology within national

⁴ Clive James, "Progressing Public-Private Sector Partnerships in International Agricultural Research and Development. *ISAAA Briefs*, No. 4, ISAAA, Ithaca, New York, 1997, p. 19.

⁵ ISAAA, "Three Year External Review," 1994. Accessed from the World Wide Web at <http://www.isaaa.org/EXR95.htm> on July 4, 2000.

agricultural research systems (NARS) and to develop national capacity to conduct biotechnology research and development (R&D).

For ISAAA, “capacity” refers to a country’s ability to adopt and integrate patented technologies from the North into local production systems. Its programmes, therefore, concentrate on field testing, gene transfer into local varieties, biosafety, negotiating license agreements and managing intellectual property rights. Since public opinion can interfere with the transfer of biotechnology — as seen in countries as diverse as Bolivia, Indonesia, Brazil, France, India or Thailand — ISAAA’s programs are also directed at promoting public acceptance of the technology. This is done through publications, seminars, workshops, and, most importantly, its fellowship programs. Through fellowships, scientists and policy makers from the South are sent to corporate headquarters and regulatory authorities in the North to learn about such things as food safety regulations and how to do field trial applications, but also to establish personal relationships.

ISAAA in Asia

ISAAA’s involvement in Southeast Asia began in 1996 when IRRI hosted ISAAA’s annual board meeting at its facilities in Los Baños, the Philippines. A key participant at the meeting was the Philippines’ Secretary of Science and Technology, William Padolina. Dr Padolina soon became the Deputy Director-General of IRRI, and not coincidentally in January 1998, the SEAsiaCenter opened for business — on IRRI’s grounds. The location not only strengthens ties between ISAAA and one of the most influential agricultural research institutes in Asia,⁶ but it lends ISAAA an automatic veneer of credibility.

The Director of the SEAsiaCenter is Dr Randy Hautea, former head of the Philippines’ Institute of Plant Breeding. The Center targets Indonesia, Malaysia, the Philippines, Thailand, and Vietnam because “they all have the political will to pursue and adopt biotechnology applications.”⁷

⁶ IRRI and ISAAA collaborate in several activities. While IRRI scientists participate in ISAAA seminars, Dr Hautea is a resource person for IRRI’s Asia Rice Biotechnology Network. Dr Hautea is even on IRRI’s staff list at its website.

⁷ ISAAA, *This is ISAAA*, April 2000, ISAAA, Ithaca, New York, p. 3.

Table 1: ISAAA’s partnership projects in Southeast Asia⁸

PROJECTS	PARTNERS IN THE SOUTH	PARTNERS IN THE NORTH
Papaya Biotechnology Network	<ul style="list-style-type: none"> • Research Institute for Fruits (Indonesia) • MARDI (Malaysia) • BIOTEC (Thailand) • Institute of Biotechnology (Vietnam) • Institute of Plant Breeding (Philippines) 	<ul style="list-style-type: none"> • Monsanto (USA) • Nottingham University (UK) • University of Hawaii (USA) • Zeneca Agrochemicals (UK)
Tomato Virus Diagnostics	<ul style="list-style-type: none"> • Central Research Institute for Horticulture Crops (Indonesia) 	<ul style="list-style-type: none"> • Novartis Seeds (Switzerland) • Wageningen University (Netherlands)
Black Rot Diagnostics	<ul style="list-style-type: none"> • Asian Vegetable Research and Development Center (Taiwan) 	<ul style="list-style-type: none"> • Washington State University (USA)
Bt Sweet Potato	<ul style="list-style-type: none"> • Agriculture Science Institute (Vietnam) 	<ul style="list-style-type: none"> • Novartis Seeds (Switzerland)
Bt Soybean	<ul style="list-style-type: none"> • Indonesia (?) 	<ul style="list-style-type: none"> • AgrEvo (Germany)
Bt Corn	<ul style="list-style-type: none"> • Institute of Plant Breeding (Philippines) 	<ul style="list-style-type: none"> • Asgrow Seeds (Monsanto)
Vitamin A Rice ⁹	<ul style="list-style-type: none"> • International Rice Research Institute (Philippines) 	<ul style="list-style-type: none"> • Rockefeller Foundation (USA) • Swiss Federal Institute of Technology (Switzerland)

These technology transfer projects start with the identification of potential biotech applications in local farming and move on to removing hurdles to the full-scale deployment of transgenic crops. The major impediment to this end goal, at present, is “the lack of effective biosafety regulations and an uninformed public sometimes skeptical about transgenic crops.”¹⁰ These are key concerns for ISAAA.

A bedfellow brokerage

One of the most important functions of ISAAA’s projects is fostering the kind of personal relationships that will ensure the critical impetus to the adoption of biotechnology. In its own words, “By arranging for senior policymakers from developing countries to share views with business leaders of private corporations, ISAAA helps to generate the trust, confidence, and cooperation that will integrate developing countries into the agri-biotech revolution.”¹¹ In

⁸ Except where indicated, the information is sourced from ISAAA publications.

⁹ Personal communication from Duncan Macintosh, Head of Public Awareness at IRRI, October 2, 2000.

¹⁰ R. Hautea, Y.K. Chan, S. Attathom, and A.F. Krattiger, “The Papaya Biotechnology Network of Southeast Asia: Biosafety Considerations and Papaya Background Information,” *ISAAA Briefs*, No. 11, ISAAA, Ithaca, New York, 1999, p. 2.

¹¹ ISAAA, *ISAAA Biennial Report 1997-1999*, ISAAA, Ithaca, New York, 1999, p. 7.

essence, ISAAA is building up an advocacy elite to create the regulatory environment for the successful introduction of corporate biotechnology from the North. In the process, these experts are expected to dampen social concerns and public dissent emerging at the local, national or regional level.

The strategy seems to work. After visiting Monsanto's Life Sciences Research Center, Dr. Chan Ying Kwok, a papaya breeder with the Malaysian Agricultural Research and Development Institute, said, "Walking through the greenhouses there I realized I was seeing agriculture's future. It was exciting and inspiring."¹² Dr Parichart Burns, a researcher with Thailand's National Center of Genetic Engineering and Biotechnology (BIOTEC) had similar feelings when she visited Zeneca's facilities in the UK: "We were able to see what the future holds for biotechnology . . . You realize that this technology is going to change everything."¹³

Going through a fellowship with ISAAA can have significant downstream implications. In September 1999, Dr Ruben Villareal, the Director of the South East Asia Regional Center for Research and Graduate Education in Agriculture (SEARCA), participated in an ISAAA study tour to Europe and North America.¹⁴ Soon after, his institute — which is mandated by the governments of Southeast Asia to develop sustainable agriculture in the region — announced that biotechnology was now a "priority theme" in its new five-year plan. According to Villareal, "Our interest lies in ethics and policy implications of biosafety standards set by each country, and how these can be harmonized."¹⁵ ISAAA and SEARCA have just announced they will jointly establish a Biotech Center in Los Baños, the Philippines, where both are located.¹⁶

Since ISAAA's activities involve high-level policy-makers, they can have immediate impacts. For instance, ISAAA held an ASEAN (and China) workshop on biosafety in cooperation with Indonesia's Central Research Institute for Food Crops (CRIFC) in 1993. According to Dr. Sumarno, the Director of CRIFC, the meeting "triggered the development of our biosafety guidelines." After the workshop a small group drew up a draft based on Australian guidelines which were released by ministerial decree "because of the pressing need for guidelines."¹⁷

The "team feeling" established by ISAAA's personal approach spreads the sentiment of "us" (the pro-biotech camp) versus "them" (the anti-biotech camp) and as a consequence shatters the basis for real analysis of the issues and opportunities from a national development perspective. The full social, economic, and political implications of "the agri-biotech revolution" for the different countries and sectors in Asia are, in ISAAA's agenda, simply not considered.

¹² D.P. Alvarez, "Connecting People to the Promise of Biotech: Update of the ISAAA Fellowship Program in Africa and Southeast Asia," *ISAAA Briefs*, No. 15, ISAAA, New York, 2000, p. 1.

¹³ D.P. Alvarez, "Connecting People to the Promise of Biotech: Update of the ISAAA Fellowship Program in Africa and Southeast Asia," *ISAAA Briefs*, No. 15, ISAAA, New York, 2000, p. 4.

¹⁴ Dr Villareal is a member of the IRRI-Asian Development Bank Asia Rice Biotechnology Network.

¹⁵ Dr Ruben L Villareal, "Closing Remarks", D.L. Umali Memorial Lecture (Biotechnology Forum), Ortigas, 10 March 2000. Retrieved from http://www.isaaa.org/dlimali/dlimalilectweb/closing_remarks.htm on October 2, 2000.

¹⁶ Duncan Macintosh, IRRI, personal communication, October 8, 2000.

¹⁷ R. Hautea, Y.K. Chan, S. Attathom, and A.F. Krattiger, *op. cit.*, pp. 58-59.

2. Biotech as a cure for poverty?

ISAAA's mission is an ambitious one: "to contribute to poverty alleviation in developing countries by increasing crop productivity and incomes, particularly among resource-poor farmers, and to bring about more sustainable agricultural development in a safer global environment."¹⁸ However it is constrained from the start by a very narrow framework: all of ISAAA's activities must encourage and deploy biotechnology in the target country. This will only work if biotechnology is the appropriate and effective way to address the needs of the resource-poor farmers. Since poverty is rooted in structural social, political, and economic problems — not a lack of technology — ISAAA's projects inevitably suffer from the same limitations as the Green Revolution. In both instances, the poverty of small farmers is used to justify the intrusion of an external technology, but the technology itself cannot address their fundamental problems. As Linda Cayanan, a farmer in Pampanga in the Philippines, points out:

I don't even have land. I am renting some land together with my husband where we are planting rice. Sometimes, I work as a farm worker for other farmers. What can I do with these new seeds? I'm sure they are expensive and they will also require expensive pesticides. Who will pay for them? We cannot. And even if we would be able to plant them, any surplus they would create would go to the landlord and to the traders. We would still be as poor as ever. Poor farmers need land in the first place so they can reap the fruits of their own work.

The Mexican potato project

Off the map of Asia but essential for understanding ISAAA is the Mexican potato project. In 1991, ISAAA initiated its first biotech transfer scheme. This involved a deal between Monsanto and Mexico's Center for Research and Advanced Studies (CINVESTAV) for the transfer of coat protein genes for Potato Virus X (PVX) and Potato Virus Y (PVY) resistance. It was followed by another deal, in 1997, for a replicase gene for resistance to Potato Leafroll Virus (PLRV). The Rockefeller Foundation kicked in \$350,000 to finance the project.¹⁹

ISAAA states that "the project regards resource-poor small-scale farmers as the main target group." From the outset, this makes the project a non-starter because small-scale farmers have little interest in the technology. In Mexico, potatoes are predominantly grown by large- and medium-scale farmers. For small farmers that do grow potatoes, "PVX and PVY are not the most pressing problems in Mexican potato production. Resistance to these two viruses alone is beneficial for farmers only if it is not associated with an extra cost."²⁰ Not surprisingly, only large-scale farmers have expressed an interest in the PVX/PVY resistant potatoes.²¹ PLRV is a more significant problem, but it too is of relatively minor importance when compared with leaf

¹⁸ ISAAA, *This is ISAAA*, op. cit., p. 2.

¹⁹ Peter Commandeur, "Private-Public Cooperation in Transgenic Virus-resistant Potatoes: Monsanto, USA-Cinestav, Mexico," *Biotechnology and Development Monitor*, No. 28, September 1996, p. 15.

²⁰ M. Qaim, "Transgenic Virus Resistant Potatoes in Mexico: Potential Socioeconomic Implications of North-South Biotechnology Transfer," *ISAAA Briefs*, No. 7, Ithaca, New York, 1998, p. 28.

²¹ Peter Commandeur, op. cit., p. 18.

blight and other structural problems. The virus-resistant potatoes cannot even be expected to reduce pesticides since pesticides are not used specifically against the disease.²²

Potato production in Mexico is firmly split according to landholding size, crop varieties and geography. Large-scale farmers (with over 20 ha) are responsible for 64% of the overall potato production.²³ These farmers plant exclusively white varieties, derived from imported germplasm, while small scale farmers grow local red varieties, which fetch a lower price in the market but are resistant to blight — by far the most serious disease affecting potato production in Mexico. The ISAAA project involves the development of both red and white virus-resistant potatoes. According to the licensing agreements brokered by ISAAA, CINVESTAV can transform local varieties with the PVX and PVY genes but it cannot transform imported varieties “suitable for processing.” The agreement for PLRV involves more stringent conditions of use, and CINVESTAV is not allowed to transform the Alpha variety with the PLRV gene. Alpha is a white variety that accounts for 60% of the total production volume.²⁴ Furthermore, Monsanto stipulates that, while CINVESTAV can share the transformed material with other developing countries, no transformed material (including potato exports) can be transported to the USA or other countries where Monsanto has patented the technology. These restrictions on the PLRV technology significantly weaken the project’s potential benefits to large-scale and medium-scale farmers, who plant mostly Alpha varieties.

Even should small farmers be drawn to the technology, the potential for it to benefit them is even more remote. ISAAA has secured a licensing agreement for the red varieties grown by small farmers, but there are currently no mechanisms to get these varieties out to small growers. As stated in one of ISAAA’s reports: “The existence of a formal seed market for a certain variety is the precondition for the introduction of the technology into this variety. Under the current seed distribution system, therefore, transgenic virus resistance will not be disseminated in red varieties.”²⁵ Had ISAAA examined the situation from the outset, it would have seen that small potato farmers are completely cut off from all agricultural support. They have no access to credit even though potato production is extremely expensive. Public technological assistance vanished with the implementation of Structural Adjustment Programs during the last two decades, which sharply reduced the national budget for extension services.²⁶ And, to compound the problem, small farmers have little capacity to demand changes, as they are not represented in the national potato growers associations.²⁷

Seven years into the project, ISAAA admits that: “Strategies to disseminate the technology and place it in the hands of small scale farmers have not yet been identified.”²⁸ Now it claims to be working with the government to bring small farmers within the seed distribution network by subsidizing private seed production. Under the plan, the state would buy genetically-engineered red seeds from commercial seed breeders at a promised price and then distribute them at a lower,

²² M. Qaim, *op. cit.*, p. 8 and p. 23.

²³ *Ibid.*, p. 10.

²⁴ *Ibid.*, p. 7.

²⁵ *Ibid.*, p. 26.

²⁶ *Ibid.*, p. 13.

²⁷ *Idem.*

²⁸ *Ibid.*, p. 1.

more affordable price to small-scale farmers. But there is no clear assurance that the Mexican government will take this U-turn to rescue its small potato growers. And even if it does, the project will likely still fail because of the crisis potato growers are facing because of the North American Free Trade Agreement (NAFTA). Currently, local potato production is sustained by tariffs of around 272%. Under NAFTA, the tariff must be reduced to zero by 2004. This is bad news for Mexican growers, since US production costs are much lower. The cost for Mexican small-scale farmers is \$1165 million/ton (M/t), while for American farmers in Idaho it is only \$863M/t and in North Dakota it is \$838M/t.²⁹

Monsanto, meanwhile, is confident that the project will create the conditions for its seed interests. According to Rob Horsch of Monsanto, “The smaller benefit of the virus resistance will be the catalyst to . . . the development of an infrastructure to supply clean certified seed of the best germplasm with improved traits.”³⁰

The Tomato Spotted Wilt Virus project in Indonesia

ISAAA’s emphasis on “capacity building” and, in particular, the determination to build partnerships between industry and public institutions can make the stated objective of assisting poor farmers meaningless. This is what has happened with ISAAA’s Tomato Spotted Wilt Virus (TSWV) project in Indonesia.

In 1997, ISAAA initiated a collaborative project between Indonesia’s Central Research Institute for Horticulture Crops (CRIH), Novartis Seeds and Wageningen Agricultural University (Netherlands). Two CRIH scientists were sent on a five-week “intensive” fellowship to learn how to use techniques developed by Novartis. For ISAAA, the project, like all diagnostic projects, is considered a “stepping-stone” to more advanced applications of biotechnology. Perhaps the project will improve CRIH’s capacity to manage the disease, but more significantly, it opens the door in Indonesia for the deployment of crops genetically engineered for resistance to TSWV, particularly those developed by Novartis and Wageningen. Wageningen has a patent for genetically-engineered TSWV-resistant plants³¹ and Novartis Seeds has already filed an application to test its genetically engineered TSWV-resistant tomatoes in the US. But how will the technology benefit small farmers? ISAAA can only say that the “training also strengthens Indonesia’s national agriculture program by establishing a solid biotechnology infrastructure.”³² But the intrusion of a seed giant such as Novartis is no help — and almost certainly a disbenefit — to small farmers in the region.

The Papaya Biotechnology Network

According to ISAAA:

The [Papaya Biotechnology] Network was formally launched in March 1998, with the primary mission of contributing to improved quality of life for rural and urban families in Southeast Asia ... The Network seeks to positively impact the lives of resource-poor and small-scale farmers in

²⁹ Ibid, p. 18.

³⁰ Peter Commandeur, op. cit., p. 18.

³¹ US 5939600

³² ISAAA, *ISAAA Biennial Report 1997-1999*, ISAAA, Ithaca, New York, 1999, p. 36.

*Southeast Asia by increasing the availability of papaya for both food and — through the sale of surplus fruit in local market — modest incomes.*³³

The only means that the project considers for accomplishing this objective is the development and introduction of papayas genetically engineered for resistance to the papaya ringspot virus (PRSV). Although, the transgenic papayas have yet to be released to farmers, Dr. Hautea champions the Papaya Biotechnology Network as “a model that proves biotechnology works in developing countries.”³⁴ But who is it working for?

The transgenic papayas were originally developed for the export industry in Hawaii, where papaya is grown on relatively large farms. It is logical, then, that Malaysia, with a million dollar papaya export industry, is most interested in the technology transfer. Malaysia’s industry took off at the beginning of the 1990s, when the Malaysia Agricultural Research and Development Institute (MARDI) introduced its two Eksotika varieties.^{35,36} Before their introduction, papaya was grown in backyards or as a cash crop during the early establishment of rubber or oil palm plantations. With Eksotika, permanent papaya farms were established to cater to the new export markets, ranging in size from 1-2 ha monoculture farms to large-scale plantations of 500 ha. Since the Eksotika varieties are extremely susceptible to PRSV, and disease pressure is enhanced by monoculture cultivation practices, problems with PRSV rapidly emerged. The disease devastated papaya production in 1991 — the first year it was detected in Malaysia.³⁷ According to scientists at MARDI, PRSV “is the most important constraint that has curbed the development of the papaya industry in ASEAN countries.”³⁸

The project is more likely to reach small farmers in Thailand than in Malaysia, since papaya remains a backyard crop, with 100,000 families engaged in production and only 0.6% of papaya production exported. PRSV is a major problem for papaya production in the North of the country and Thai researchers and farmers have had moderate success with a number of strategies to combat the disease, including resistant varieties and cultural practices.

Thailand has worked on biotechnology applications for PRSV since 1995, when the Plant Genetic Engineering Unit of Kasetsart University participated in a project with Queensland University of Technology with support from the Australian Centre for International Agricultural Research. ISAAA helps with biosafety and intellectual property rights issues. It brokered a deal with Monsanto, which owns the 35s promoter gene used in the gene construct, and other patent owners to permit Thai scientists to use the technology for research and development purposes alone. So far, ISAAA has made no attempts to broker a deal for the commercialization of the papaya. In Hawaii, where the technology was donated for free, the Papaya Administrative Committee incurred at least \$100,000 in legal expenses trying to secure the patent licenses.³⁹

³³ R. Hautea, Y.K. Chan, S. Attathom, and A.F. Krattiger, op. cit., p. 2.

³⁴ ISAAA, *ISAAA Biennial Report 1997-1999*, op. cit, p. 17.

³⁵ R. Hautea, Y.K. Chan, S. Attathom, and A.F. Krattiger, op. cit., p. 92.

³⁶ Eksotika I sells for RM 1,000 (US\$ 263) per kilo and Eksotika II, a hybrid, sells for RM 3,000 (US\$ 790) per kilo.

³⁷ R. Hautea, Y.K. Chan, S. Attathom, and A.F. Krattiger, op. cit., pp. 24-26.

³⁸ *Ibid.*, p. 89.

³⁹ Press Release from the State of Hawai’i, Office of Governor Benjamin Cayetano, October 28, 1998. Retrieved from http://gov.state.hi.us/News/98_210.html on August 17, 2000.

The mire of license agreements is not the only problem with the transgenic varieties. The technology itself may be a dud, as growers in Hawaii are already suggesting. According to the Hawaii Tribune-Herald, the papayas have a short shelf-life before turning mushy and they tend to be oversized, making them more expensive to ship. Growers say they get three times the price for older varieties and that the important Japanese market has banned genetically-engineered varieties.⁴⁰ Fruit producers in Southeast Asia voice similar concerns. At a meeting in June 2000 with Thailand's Ministry of Agriculture, Mrs. Pranee Srisomboon, the general manager of the Thai Food Processor's Association, argued that growing genetically-engineered papayas would have negative effects on the industry's exports of canned fruit salad to Japan, USA and Europe.⁴¹

The transgenic papayas also raise important biosafety concerns. According to Dr Peter Palukaitis of the Scottish Crop Research Institute, the genetically-engineered virus gene inserted in the papaya "may end up mixing with DNA from other viruses that infect these papaya plants, possibly resulting in the creation of new, potentially more virulent disease-causing viruses." Other risks include what is known as "synergy," in which the mere presence of the genetically engineered virus in the plant's DNA makes it sicker than it would otherwise be when infected by another plant virus.⁴² In Hawaii, the widespread use of the transgenic papaya has created considerable virus pressure and there are already signs that the papaya is "less disease-resistant than advertised."⁴³

For whom does the biotech bell toll?

Without having produced tangible benefits for small farmers, the connection between ISAAA's technology transfer projects and the well-being of small farmers is a leap of faith. It is based on the assumption that biotechnology *per se* is good for small farmers. According to Dr Krattiger, "Feeding the world's rapidly growing population and stopping environmental degradation will require agri-biotechnology."⁴⁴ Yet many small farmers in Asia, such as those consulted about ISAAA's work for the purpose of this paper,⁴⁵ do not share this perspective at all (see box). Orly Marcellana, a farmer from Quezon, the Philippines, echoes the cynicism that many farmers share:

Nobody from the government, nor from these companies, ever asked us what our problems are. I'm sure they don't even care. All they want is to make profit. For us farmers, it's a never ending story with these improved seeds. Every time they are introducing a new "miracle" variety, after some time it turns out to be not so miraculous after all. And then, there they are with yet another "miracle" and again, they promise us that we will be the first to benefit. But after all these

⁴⁰ "Big Isle papaya crops tainted", *Hawaii Tribune-Herald*, April 7, 2000, Front Page.

⁴¹ Witoon Lianchamroon, personal communication, October 10, 2000.

⁴² Carol Kaesuk Yoon, "Stalked by deadly virus, papaya lives to breed again," *New York Times*, July 20, 1999. For further information see: A. Greene, R.F. Allison, "Recombination between viral RNA and transgenic plant transcripts," *Science* 263, 1994, pp. 1423-1425, and H. Lecoq, et al., "Aphid transmission of a non-aphid transmissible strain of zucchini yellow potyvirus from transgenic plants expressing the capsid protein of plum pox potyvirus," *Molecular Plant-Microbe Interactions* 6, 1993, p. 403.

⁴³ "Big Isle papaya crops tainted", op. cit.

⁴⁴ ISAAA, *ISAAA Biennial Report 1997-1999*, op. cit., p. 9. Emphasis added.

⁴⁵ The quotes from the farmers were gathered by the participants in this research project.

“miracles” our conditions are still the same. We are poor as ever. Do they really think that the farmers still believe in these “miracles”?

The examples above illustrate ISAAA’s most critical failing: it has never stopped to ask small farmers — its target group — what they think the problems and solutions are, and what role, if any, biotechnology can play. This raises fundamental questions about ISAAA’s accountability and legitimacy.

A farmer’s eye view

Shaban Ali, Shekher Dair, Ishwardi, Pabna, Bangladesh

“Tell me, if I can do very well with my existing seeds, why should I need laboratory seeds or the altered seeds (GMOs)? If I can conserve my own seed, why would I be so stupid as to purchase seed from the company? The problem is that farmers are helpless because government and the scientists are collaborating with the companies to destroy us. This is not science; it is politics. Science should start with the knowledge of the farmers; what the present seeds are doing, and what is possible to do in the future. It is not the task of science to mutilate the generative capacity of seed, or to make a variety that is a bizarre combination of characteristics. No sensible person will find any justification in such act.”

Pak Siawang, Jene'berang Village, Gowa, Indonesia:

“All technologies have some negative impacts and can marginalise people, creating inequality. This is the same with genetic engineering, of which we don't know and we are not being informed properly about how it was produced, but it must have negative impacts, just like the high-yielding variety seeds. We will be forced to buy chemical fertilizers and pesticides, for which the prices always increase.”

Mr. Witoon Boonchado, President of Tung Kula Ronghai Farmers Association, Roi Ed, Thailand

“The GE crops are happening because of the greed of TNCs. This cannot give us any benefit. TNCs are the sole beneficiaries. There are many alternatives and sustainable ways to solve farmers’ problems. By using only organic fertilizer and traditional varieties we can improve both yield and quality.”

Rekha Begum, Village Kandapara, Delduar, Tangail, Bangladesh

“We lost our own seeds when company people and government officers told us that Irri-dhan (HYV rice variety) was good. Believing them we not only lost our seeds, but we lost our fish because of pesticide, lost our livestock because the fodder was reduced and the quality was bad, and most importantly we lost our health. It took more than 10 years of hard work to reintroduce our varieties and we are far better than before. Now the companies are talking about new types of seed produced by bizarre manipulation (biotechnology) to cheat us again.”

Jahanara Begum, Badarkhali, Chokoria, Bangladesh

Who needs these seeds? Do not [claim] that seeds produced in some laboratory can feed the hungry. We want paradise on earth, not hell created by seed companies, because we care for where we dwell with our children and our extended family that includes our animals, birds, plants and everything that is our life. We do not want more paddy by destroying our dwelling and our community relation of love and sharing. Companies should leave us alone; farmers know how to take care of themselves and live happily.

Mrs. Nuan Namkiang, Roi Ed, Thailand

“I do not want to repeat the mistake made when farmers embraced the Green Revolution some 20 years ago.”

3. The business of charity

ISAAA's projects aim to bring the benefits of biotechnology to where they are purportedly needed most — developing countries. “Need”, in ISAAA's logic, refers at once to poverty, which biotechnology is supposed to help alleviate, and a lack of access to biotechnology, which ISAAA will rectify by “contribut[ing] to self-reliance and sustainability through national capacity building for the long term.”⁴⁶ Despite the rhetoric, ISAAA's projects show a remarkable lack of concern for either the needs of the poor, as it would define them, or national self-reliance and sustainability. ISAAA is all about a big business agenda — the integration of Third World economies into a biotechnology-driven market controlled by the North. This is best seen at work in the way ISAAA handles the intellectual property hurdle of technology transfer.

The private sector owns the majority of the pieces required for any of the biotechnological applications that hold so much promise for farmers, particularly in the poorer areas of the developing world. This is irrespective of Monsanto's announcement on April 3, 2000 that it will make its rice genomics information freely available to scientists.

R David Kryder, P Kowalski and Anatole G Krattiger, ISAAA, 2000

Under its intellectual property rights (IPR) program, ISAAA has a straightforward agenda that follows a simple rationale: biotechnology is largely the subject of private intellectual property rights in the industrialized countries and therefore developing countries need to honor these ownership rights if they want to access the technology. ISAAA cannot succeed in its mission in Asia unless governments adopt stronger intellectual property laws and unless scientists are willing to negotiate licenses. So the task for ISAAA is to stimulate policy reform and teach research administrators how to manage IPR in its target countries.

This is not an easy task. The issue of IPRs in relation to plant, animal and human genes is becoming a minefield for policy makers. In Europe, such debates have the highest level policymakers in a quandary and political commitments frozen in their tracks.⁴⁷ Meanwhile, developing countries are fighting to reframe global IPR obligations in relation to genetic resources under the World Trade Organization's agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). For Northern governments and the biotech industry that ISAAA works with, the TRIPs agreement means — as a minimum — granting patents on microorganisms and microbiological processes, as well as some kind of legal protection over new plant varieties. Few developing countries at WTO have fully implemented TRIPS because they see it as a threat to food security and biodiversity.

In the absence of what it sees as adequate legislation, ISAAA focuses on licensing strategies to facilitate access to proprietary technology *outside of the IPR system*. This means that until the intellectual property systems are in place in the poor countries, to protect the rights of

⁴⁶ ISAAA, “Three Year External Review,” op. cit.

⁴⁷ After twelve arduous years of debate, the European Union was supposed to implement its directive on biotechnology patenting by mid-2000. Only three countries of the 15 did so. Two are trying to get the directive scrapped at the European Court of Justice and at least two others are suggesting renegotiation.

biotechnology patent holders in the rich countries, contract law will have to prevail. In the words of Dr Krattiger:

*ISAAA dedicates much of its resources to . . . brokering agreements that fall outside the traditional IPR framework. The reason is . . . that a large percentage of developing countries do not permit patents on plants and animals. As a consequence, in order to develop new channels of technology transfer, it is imperative to develop new systems initially based on trust and with time ISAAA believes that such agreements will become modus operandi. Considering the private sector's understandable reluctance to donate expensive technologies for free, ISAAA invests much of its resources to building trust in the private sector by gradually increasing the complexity of transfer agreements.*⁴⁸

The complexity of moving proprietary technology around the life industry is mind-boggling. The infamous pro-Vitamin A rice which is being promoted as salvation for millions of malnourished women and children across the Third World purportedly carries no less than 70 patents on it.⁴⁹ By the time it moves from Switzerland, where it was developed, to a country like Bangladesh, where it is supposed to be commercialized for free, a huge number of licenses and agreements must be negotiated, according to ISAAA, to prevent Bangladeshi farmers from having to pay all the costs of research that went into it. Quite apart from the headaches a process like this entails, no one involved in promoting this technology is asking the farmers if they want it in the first place, and few are questioning whether this kind of intellectual property tangle is legitimate at all. More fundamentally, there is a profound mismatch between the privatization of agricultural research and the pursuit of the public good. Achieving one through the other is essentially impossible. But ISAAA is attempting it anyway. It trains people how to buckle up, face the music of the TNCs who demand the kind of market control afforded to them through IPR, and tries to support them in the IPR quagmire. In so doing, ISAAA actively promotes the expansion of the patent system to the life sciences.

ISAAA has gone a step further than simply dealing with licenses and transfer agreements. It is also taking it upon itself to secure its own intellectual property rights over technologies it deems relevant for Asia's poor in the name of Asia's poor. In April and August of this year, ISAAA filed two separate US trademark applications on the words "Golden Rice". It claims to have done this "to ensure that the name *GoldenRice*TM remains in the public domain for the benefit of resource-poor farmers."⁵⁰ Who in the community of nations authorized an entity like ISAAA to secure private rights over the Golden Rice name for the purpose of ensuring its public domain status — if that makes sense — is a mystery. How resource-poor farmers will benefit from this operation is even more obscure.

⁴⁸ A. Krattiger, "Insect Resistance in Crops: A case study of Bt and its transfer to developing countries," *ISAAA Briefs*, No. 2, ISAAA, Ithaca, New York, 1997, pp. 24-25.

⁴⁹ See R. David Kryder, Stanley P. Kowalski and Anatole F. Krattiger, "The Intellectual and Technical Property Components of pro-Vitamin A Rice: A Preliminary Freedom-To-Operate Review", *ISAAA Briefs*, No. 20, ISAAA, Ithaca NY, 2000.

⁵⁰ *Ibid*, p. x.

Conclusion

ISAAA appears to be successfully influencing the development of biotechnology in Asia. It has brought together a large number of scientists and officials, generated enthusiasm among them for biotechnology by sending them to cutting-edge US facilities, and then trained them to be excellent spokespersons for the needs of this industry. This advocacy network is active in science, government, business, education and media throughout the region. ISAAA is influencing the course of public policy development related to genetic engineering in the region, encouraging US-style biosafety and intellectual property regimes.

ISAAA is a valuable tool for the biotech industry. On the one hand, it supports a constant stream of public relations exercises to propagate hype about humanitarian motives behind biotechnology. On the other hand, it concentrates on generating the proper business climate for the biotech industry's market expansion in important developing countries. It is not surprising, then, that the industry provides funding and other resources to ISAAA and plays an important role in directly governing the institution.

From the standpoint of farmers in the region however, ISAAA's operation suffers from numerous drawbacks. Too many of ISAAA's premises are based on vested interests. If the problem ISAAA seeks to address is poverty in Asia's farming sector, biotechnology is not the right starting point. Many farmers do not believe that biotech will improve their conditions at all. ISAAA's suggestion that North and South, private and public can be treated as "equal partners"⁵¹ is strategically erroneous. As Perfecto Vicente, a farmer from Davao del Norte in the southern Philippines, explains:

Since farmers are not involved in the development of biotechnology, it will always lead to the control of resources and control of benefits by the companies. When it comes to planting GMOs, it will seem like the farmer is the co-producer but when it comes to equity, the farmer is at the losing end since corporations have carefully computed their earnings from such a venture and they will make money even if the farmer's crop fails. Farmers will be mere suppliers of raw materials while the companies will be the processors because they hold the technology and they have capital.

ISAAA's agenda will only make conditions worse for small farmers. Biotechnology is controlled by foreign agribusiness whose interests are diametrically opposed to the needs of small farmers. Small farmers need sustainable, inexpensive technologies that do not come with high risks, or generate dependency on foreign companies. ISAAA's technology projects, despite their modest nature and especially because of their larger intent, offer no practical help to small farmers.

Finally, there is a very serious problem of accountability permeating ISAAA's operations. ISAAA uses the poverty of small farmers in Asia to pursue its own agenda. The institution is not transparent and cannot be since it carries responsibility for corporate security, both in its

⁵¹ Anatole F. Krattiger, "An Overview of ISAAA from 1992 to 2000", *ISAAA Briefs*, No. 19, ISAAA, Ithaca NY, 2000, p. 6.

constitution and in the deals it brokers. What it boils down to is that, through ISAAA, industry is using local people — from illustrious scientists to anonymous small farmers — across Asia to promote biotechnology and expand markets for its own benefit. Unfortunately, more than just being used by ISAAA, small farmers are also being put at risk. Biotechnology comes packed with both environmental and socioeconomic threats that will be borne primarily by the farmers. They are the ones who will feel any negative health or ecological impacts most acutely and they are the ones who will face the consequences if the crops fail or promised markets disappear.

ISAAA is pushing a much broader agenda than the donation of private technology — one that benefits industry from the North while offering no clear benefits to the South. Rather than accept the gifts of high-tech papayas, people of all walks in Asia should filter out the hype and make a much more critical assessment of what biotechnology, and its agents like ISAAA, really have to do with “development”.

APPENDIX

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ISAAA in Asia

Promoting corporate profits in the name of the poor

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