

A strategic and complementary combination of interpersonal communication and different mass media modalities is recommended for effective science communication projects. Interpersonal communication is needed to achieve acceptance and use of technology while mass media help promote awareness, knowledge and understanding. The choice of and combination of communication strategies is determined by specific information requirements and needs. The following are examples of approaches and strategies used by the Global Knowledge Center on Crop Biotechnology (KC) and its information network of Biotechnology Information Centers (BICs):

Interpersonal Communication

Despite advances in communication techniques, face-to-face interaction remains to be the most popular choice of communication in developing countries. Personal interfaces allow people to interact in close proximity, use sensory channels to relay messages, and receive immediate feedback. Building networks and enhancing partnerships, or interacting with various stakeholders is essential to get information across, obtain immediate feedback, and correct/modify understanding of messages. Seminars, conferences, roundtable discussions, and workshops are some venues for interaction for specific audiences and desired impact. The content and duration as well as frequency are determined by the specific objectives to be addressed, and are affected by such concerns as budget constraints, logistical limitations and stakeholder interests.

Networking. A crucial role is establishing networks and partnerships with various stakeholders in both the public and private sectors. It can be among and between universities or academic institutions, the government sector, industry, and civil society groups such as those representing consumers and producers. Forging contacts enable organizations to share resources and experiences, avoid unnecessary duplication, and gain leverage by spreading the responsibility and accountability around. Participating in activities with like-minded organizations and those perceived highly on the credibility ladder is advantageous for

Developing Communication Approaches and Strategies



the success of science communication projects. It is also important to scan the local biotech environment, monitor media reporting, identify key institutions and people, and sustain relationships.

As the BICs assume a more prominent role in the biotech environment, they can take an important role in national policy and related activities. The BIC in Indonesia helped to draft and edit the guidelines on laboratory and field trial implementation of biotech research and development prepared by Indonesia's Ministry of Agriculture. It likewise drafted and provided information for country reports on biosafety for the Ministry of Environment. Thailand BIC was requested to moderate a discussion on policy on research and development (R&D) of biotech crops, and assisted in the drafting of the biosafety law with the Ministry of Natural Resources. It also held meetings with the Department of Agriculture and other institutions to discuss the biosafety framework, biotech promotion, and public-private partnerships. Bangladesh BIC helped to formulate a biosafety clearing house for the Ministry of Environment and Forests.

Seminars and workshops on biotechnology principles and applications are

opportunities to update stakeholders on the latest trends as well as issues and concerns. These programs contribute to creating an enabling environment to support, for example, regulatory approval and eventual commercialization of biotech crops and food. Technical lectures and field trips to actual biotech fields or laboratory experiments enable stakeholders to integrate theoretical with practical learnings. The basic

communication approach is the 'seeing is believing' technique. Based on the workshop objectives, specific stakeholders can share experiences, i.e. farmers on using certain technologies, or representatives from both public and private sectors doing R&D on biotech crops.

Heads of BICs are often invited to be resource persons in seminars and workshops organized by government and private agencies. Topics aside from BIC program are basic biotechnology, the status of country biotechnology initiatives, biosafety issues, communicating biotechnology, and global review of biotech crops.

Seminars. A half or one day seminar can be conducted for various stakeholders. Malaysia for example, organizes career talks for students and parents, co-sponsors discussions on genetic engineering in agriculture and biotechnology with organizations such as the Malaysian Agriculture Research and Development Institute, and the Ministry of Education. Egypt conducted a biotechnology and biosafety seminar for members of Parliament with the intent of familiarizing them with the technology and its issues.

Workshops. Different workshops can be designed to meet the specific needs of stakeholders. The following are examples of workshops developed for particular audiences:

Media. Communication practitioners and or government information officers and extension people are invited to a 1-2 day workshop to familiarize them with crop biotechnology initiatives, and updates on the local R & D scene. Learning strategies include lectures, laboratory exercises, video presentations, and a tour of laboratory and greenhouse experiments as well as farmers' fields. An educational game called K-Quest was developed by ISAAA and the Philippine BIC for use in workshops. Inspired by the children's games of Snakes and Ladders and Monopoly, the board game uses the concept of play to show the process that a biotech crop undergoes from the laboratory to farmers' fields, particularly the regulatory process.



It was also modified as a computer-based game for instant biotech quiz contests. An interactive version of the board game is currently being conceptualized so that it can be used as a teaching tool by other BICs.

BICs in India, Bangladesh, and Africa collaborated with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) to conduct series of media workshops in their respective countries either in English or in the local languages. Resource persons were biotechnology and communication experts from international, regional and national research institutes. A multi-media training kit developed by UNESCO was also tested. The experiences of these workshops inspired the development of a sourcebook on agri-biotech reporting (Navarro et al., 2006). The book, which distills the practical advice and guidelines for science communicators and journalists, is available also on the ISAAA website. A French version of the book for Francophone African journalists is also available in hard copy and online mode.

MABIC was able to invite two Australian science communication experts to spearhead a workshop on communicating biotechnology with media based in Sabah, Malaysia. The media and scientists had the opportunity to learn from each other in terms of expectations, work ethics, and a general understanding of how each stakeholder "works."

For BICs that do not have biotech crops, either commercially or in field trials, visits to laboratories or contained trials supplement the lectures. In other cases, media practitioners from one country visit countries such as South Africa, China, and India where biotech crops such as Bt cotton are being grown on commercial scale.

Scientists/Decision-Makers. Risk communication workshops equip participants with communication skills to enable them to respond proactively to high concern, controversial situations. A critical task is to be able to develop key messages that are believable, convincing, clear, concise, and positive. The intent is to



develop and identify communicators who would be able to assist in public awareness work. The workshop uses a combination of lectures, analysis of case studies, and mock media interviews that are often videoed and shown to participants to analyze and derive learnings from. Participants react to letters sent to editors or columnists of newspapers who feature a negative write-up about biotechnology, engage in simulated television interviews, and analyze articles written by scientists for newspapers. The first day is usually devoted to lectures and discussions about biotechnology and issues surrounding it. The second day is a skills course on communication, visits to a biotech laboratory or greenhouse facility, and a field trip.

Participants who attend risk communication workshops gain both technical information and appropriate communication skills. They are expected to articulate and craft message strategies that will enhance trust and minimize conflicts over controversial issues.

Other Stakeholders. Other venues for interaction are farmers' or other stakeholder workshops or study visits which aim to, among others, increase their awareness of the challenges facing agricultural biotechnology as well as its benefits; explore effective communication techniques; and facilitate sharing of experiences in using modern biotechnology. The workshop involves an introductory discussion of biotechnology concepts and issues, sharing of experiences, field tours, and planning for the next set of activities.

Farmers from Indonesia, Vietnam, Thailand, India, and Malaysia met with colleagues in the Philippines to share experiences and to talk to farmers planting Bt corn, and researchers working on biotech papaya. This farmers' workshop gave rise to the creation of the Asian Farmers Regional Network. The workshop was replicated in West Africa for farmers in Mali, Burkina Faso, Togo, and

Senegal through visits to the Bt cotton trials in Burkina Faso.

A series of risk management and social marketing training-workshops were conducted in the Philippines to prepare for the multi-location field trials of Papaya Ringspot Virus (PRSV)-resistant papaya and Fruit and Shoot Borer-resistant eggplant. These were intended to provide stakeholders, institutional biosafety committee members, and potential product champions particularly in areas where the multi-location field trials will be conducted, with the needed skills in risk communication, information dissemination and outreach.

Regional Conferences. Several BICs can organize and implement a regional conference. One case in point is a workshop on the "Development of agricultural biotechnology in Islamic countries: Sharing experiences on issues and challenges" held in Cairo, Egypt, and another in Islamabad, Pakistan on "Innovative aspects of biotech and its better awareness and dissemination." Both were spearheaded by the BICs from Malaysia, Pakistan, Egypt, Indonesia, and Bangladesh. Participants from the Islamic community in Asia and Africa converged to discuss biotechnology interventions and the role of Islam in its development. The concerned BICs helped prepare a proposal which was submitted for funding and worked with a local institution to implement the said activity.

Global Launch. An important yearly activity of the BICs is to contribute to the annual global launch of the Annual Review on the Global Status of Commercialized Biotech/GM Crops authored by ISAAA's chair Dr. Clive James. ISAAA with the Center in India and the Philippine BIC facilitated and



The annual global launch has been a very successful strategy to increase awareness of global biotech developments. The 2007 Review generated over 750 million (up from 550 million) impressions (estimated number of people reached by the articles). About 1125 print stories written in 31 languages in 46 countries were produced from the 2006 launch. In addition, interviews or features on the same topic were broadcasted on national television.

and AlAhram and magazines like Cotton Outlook. In the case of Indonesia, Warta Ekonomi, Pakuan Raya, Radar Bogor, and Radio Republik Indonesia Bogor wrote articles or radio materials based on interviews with the BIC head.

Network Meeting. The KC holds an annual planning meeting with its BICs to update each other on communication/information dissemination activities and to plan for the year ahead. Meetings have been held in Bangkok, Kuala Lumpur, Manila, Bogor, and Singapore. Each BIC gets to present a general status of biotechnology in their respective countries and then segues to accomplishments for the year in terms of gaining greater awareness and understanding of the technology. The meeting is also an opportunity for invited resource persons or network staff to share communication strategies such as website enhancement, writing for newspapers, resource generation, and proposal preparation. Visits to specific institutes of interest are made such as the Science Centrum in Singapore, Malaysian Agricultural Research and Development Institute, PRSV papaya contained field trials in Kasetsart University, Thailand, and the University of the Philippines Los Baños Institute of Plant Breeding. One-on-one interactions enable BICs and the KC staff to discuss progress made, problems faced, and expected deliverables.

Exchange visits are done among BIC staff to benefit from each others' expertise. Staff also get to attend workshops and related activities of BICs to learn techniques and network with like organizations.

Website Development



A website is a primary information source which can be accessed by many people at one time as long as they are connected to the Internet. It is a venue for information updates, sharing of information and knowledge, and allows for interactive communication. It often provides the first impression of what the institute is all about. The ISAAA website contains information on its centers, institutional programs, and resources (<http://www.isaaa.org>). The KC has a website imbedded in the ISAAA website (<http://www.isaaa.org/kc>) which focuses on its information centers, information resources, e-newsletters, and directory/links. Since a survey confirms that people visit the site to download materials, there has been a deliberate effort to provide online information resources.

The ISAAA website is designed to be user-friendly. It is organized to allow ease of navigation across sections, enables users to search sites, has an RSS page for its e-newsletter which allows immediate notification of new items, and categorizes information for easy access and retrieval of information. Many of the ISAAA publications including archived materials are available for downloading in various formats, video series can be viewed by streaming directly on screen, while flash papers (PowerPoint presentations) can be seen and used directly from the site. On-line ordering of publications is likewise possible.

BICs set up their individual websites, either independently or embedded in the host's website. The websites of BICs in Malaysia and Indonesia for example, are a sub-set of their host's website. A typical website contains information about the BIC, local news on crop biotechnology, documents and translations of BIC and KC publications, and issue backgrounders on biotechnology either in English or the national language. Thailand's website has an e-survey to determine readers perception of various biotech issues.

The websites, while focusing on specific country concerns, are visited by people from other countries. One example is

that of Egypt where top visitors to the site include those from Saudi Arabia, United Arab Emirates, Jordan, Lebanon, and Syria. Egypt's website is the only online Arabic resource on biotechnology.

E-Newsletter

The KC produces a weekly e-newsletter called the Crop Biotech Update or CBU. The CBU is a synthesis of developments in crop biotechnology worldwide with implications for developing countries. Articles are sourced from primary journals, contacts, websites of credible institutions, documents, published articles, and news from the BICs. They are categorized according to news of origin or context: Global, Africa, Americas, Asia and the Pacific, and Europe; research, announcements of biotech-related events, and document reminders.

In addition, the Biofuels Supplement is produced every two weeks devoted exclusively to developments in that field as well as announcements on events and other related issues. It basically follows the CBU format but articles are classified as news and trends; energy crops and feedstocks for biofuels program; biofuels processing; and biofuels policy and economics. Both newsletters are sent as an email to a subscriber's list that number over 500,000 from 200 countries as of early 2008. The list excludes subscribers of other listservs that pick



up news from the Update. The news (in full or selected articles) is translated into 11 other languages (Arabic, Bahasa Indonesia, Bangla, Chinese, French, Italian, Japanese, Portuguese, Spanish, Thai, and Vietnamese). It is also republished by third party institutions in their respective websites such as government agencies, public sector agencies, and private companies. One case is the Ministry of Science and Technology in Kenya.

BICs can either send a complete news article or provide basic details that a writer can transform into an article (answers to the questions who, what, where, and how). News articles submitted to the CBU are two to three-paragraph summaries with a hyperlink to the original publication, or an email contact to the main author or correspondent. An example of a BIC-generated article is:

India's DBT Posts New Guidelines for GM Crops

India's Department of Biotechnology (DBT) has formulated a set of new policy instruments in response to the increase in the number of field trials being conducted for several crops with new genes/events by public and private sector institutions. The DBT initiated an exercise to develop guidelines for conducting field trials of regulated and confined field trials of genetically engineered plants in India. The existing DBT's revised guidelines for research in transgenic plants and guidelines for toxicity and allergenicity evaluation of transgenic seeds, plants and plant parts was introduced way back in August 1998.

The new draft policy instruments include: 1). Draft Guidelines for the conduct of confined field trials of regulated, genetically engineered plants in India, 2). Draft Standard Operating Protocols (SOPs) and Recording Formats for confined field trials, and 3). Draft Protocols for assessment of toxicity and allergenicity in transgenic crops. The draft policy instruments are available for public comments at the Indian GMO Research Information System (IGMORIS) website at <http://www.igmoris.nic.in/>.

Send comments and suggestions to Dr KK Tripathi, Advisor, Department of Biotechnology at: kkt@dbt.nic.in. For more information about biotech in India contact Bhagirath Choudhary of the International Service for the Acquisition of Agri-biotech Applications (ISAAA) South Asia Center at b.choudhary@isaaa.org.

On the other hand, articles that do not have a 'global' angle can be used in the section "From the BICs." Here, articles about activities such as workshops and seminars are documented.

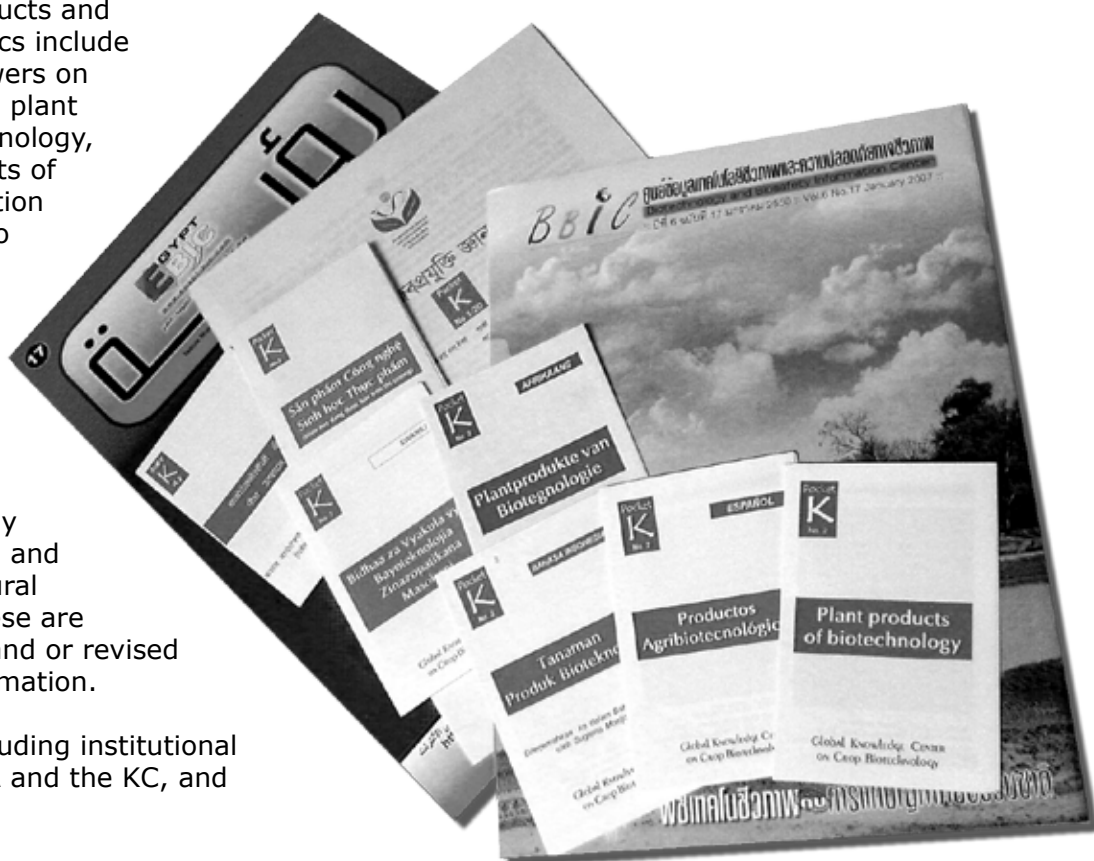
The Philippine BIC has an e-group news service that compiles news on biotechnology published by national papers and sends it out to its mailing list. It has clickable icons that provide links to various sections and a "What's up" frame showing three sections: news, information gallery, and discussion group.

Other e-strategies are **email distribution lists and discussion groups** which are effective in discussing a topic in real time through the Internet. A network of journalists and scientists, that participated in media workshops organized by ICRISAT and ISAAA, was set-up as a discussion group to get updates and share opinions about the technology. The members of the network are also recipients of the CBU. Messages and opinions are posted on the site which allows virtual interaction. BICs in Bangladesh and Malaysia use mail groups to send their e-newsletters.

Mailing list database. People who are sent e-newsletters, documents and other publications are listed in a database of subscribers or recipients. A central subscriber database management system for CBU subscribers at the KC enables the listing and categorization of recipients based on these variables: email address, country, organization, and designation. As per a formula provided by Dr. Clive James, ISAAA's chair, the BICs are estimated to have a quota of 200 subscriber-names for every 1 million population. Hence, in the case of Indonesia which has a population of 234 million, it should aim for 46,800 names in the central subscriber list. The BICs also maintain a database of both electronic and non-electronic recipients for local publications and hard copies. BICs are encouraged to update their mailing list at least once a month to enable new names to be included, information to be verified, and errors checked.

Publications and translations

Various publications from flyers, brochures, fact sheets, monographs, modules to Briefs facilitate understanding of concepts and procedures. It is



of crop biotech, development of transgenic crops, and regulatory framework and safety aspects. ECABIC wrote a banana policy brief to orient Kenyan policy-makers on the need for a better policy environment to boost performance of the banana sector, and a biotechnology handbook for policy makers.

News Releases. The BIC is a major source of news about biotech developments in a country. News could be a breakthrough or major activity, and policy or institutional development that have implications for biotechnology research and development. News in Indian newspapers such as the Hindu, Times of India, Business Standard, and Financial Express quote ISAAA in articles by-lined by journalists. This is the same case in Pakistan where press releases are written for the Associated Press, Pakistan Observer, Business Recorder Islamabad, the Nation, and News International. Bangladesh supplies articles for the Daily Star, Jaijai Din, Naya Diganta, Ittefaq, and Krishi Biplap.

BICs also send information or articles to the CBU and is oftentimes the only news coming from a specific country as in the case of Vietnam, Thailand, or Indonesia where original articles are in the local language.

Video Production

A growing niche for the KC is the documentation of information, practices, and events related to the use of certain biotechnologies in developing countries. This involves documenting story

patterns on crop biotechnology experiences from the perspectives of different stakeholders so that such learnings can be shared with other people. Videos can be used to introduce a topic during a workshop to stimulate interest, reflect on issues, and generate discussion.

The production is commissioned with either a private video company or a government television station. However, brainstorming on the script, style of presentation, audio/visual components, persons to interview, points of interest or emphasis, and related aspects are discussed by the KC with the production crew.

Years of country experiences were captured in 15-18 minute videos, notably those related to the adoption of Bt corn in the Philippines, tissue culture banana in Kenya and Tanzania, clonal forestry in East Africa, Bt cotton in India and China, and development of biotech papaya in Southeast Asia. These series of videos are used in instruction, and as springboard for discussion in workshops and seminars. Translations into local languages allow greater reach of these materials. West Africa produced a 20-minute documentary in French regarding highlights of a media workshop and visits to Bt cotton fields. This video is being used in training programs for Francophone African audiences. The Center in India spearheaded the production of the Bt cotton video and has been translated into eight other local languages. All the videos are available in video streams on the ISAAA website.

Exhibits

Institutional or topic-based panel exhibits are developed for public viewing during workshops and conferences. Exhibits enable concepts and key highlights to be presented visually using minimal text and more of visuals. India participates in annual events like Bangalore Bio where an exhibit stall is set-up and a mini-quiz competition on crop biotechnology is conducted. This allows a glimpse into the knowledge-level of the viewers from different sectors like students, farmers, government officials, and industry representatives. The Philippines participates in the country's yearly Biotech Week with an exhibit that attracts



a sizeable number of stakeholders. In Kenya, activities are highlighted through participation in such events as the weeklong Nairobi International Trade Fair and various regional agricultural exhibitions.

Other Materials/Strategies

CD ROMs and PowerPoint presentations are developed to aid stakeholders in accessing information for instruction, briefing, and outreach activities. CD ROMs can contain publications developed by the KC or BICs, workshop PowerPoint presentations, and relevant documents and materials. Modules on such topics as the global status of commercialized GM/biotech crops, an introduction to GM technology, and food safety issues and concerns, can also be produced for mentors, and other interest groups in PowerPoint format.

Radio is an underutilized communication medium that can reach a large number of people at a relatively low cost. *AfriCenter* produces radio and television plugs in the local language. Topics include introduction to modern agriculture, Bt cotton as a flagship crop in Burkina Faso and Mali, socio-economic impacts of Bt cotton, and perspectives or trends in modern biotechnology. Each of the topics identify key messages to discuss by

focusing on the most important concerns. For example, a plug on the introduction to modern agriculture emphasizes the availability of new technologies such as biotechnology, and the need to use them safely and responsibly. Potential use of radio is worth exploring particularly educational plugs and documentary programs that provide testimonials of technology users.

Bangladesh and Vietnam hold writing contests on biotechnology that attract article submissions from government employees to students. Winners get prizes and articles are published in a national paper. Aside from gauging knowledge level, the contests reflect audience interest and attitudes toward the topic.

There are many other materials and strategies that can be used in communicating biotechnology. Communicators are limited only by their imagination and willingness to think out-of-the-box.

How have the BICs communicated concepts and issues on biotech to their audiences? The next few pages give examples of the diversity of activities and work in progress being carried out by some of the BICs.



BICs *in Action*

Africa BICs

• Margaret Karembu
& Daniel Otunge

In Africa, ISAAA facilitates three Biotechnology Information Centers (BICs), one in Egypt (EBIC) for the Arab-speaking Africa hosted by the Agricultural Genetic Engineering Research Institute (AGERI); one in Mali (Mali-BIC) for Francophone West Africa housed by the *l'Institut d'Economie Rurale*, (IER) in Bamako, and the East and Central Africa Biotechnology Information Center (ECABIC) which was initially a collaborative initiative with the African Biotechnology Stakeholders Forum (ABSF) but currently hosted by the ISAAA Africa office in Kenya. In carrying out the outreach program, the Africa BICs liaise with other existing like-programs and institutions within respective sub-regions to avoid duplication and ensure synergy of effort. Two such arrangements include a joint venture with the AfricaBio in South Africa and in Burkina Faso with the Burkina Biotech Association (BBA).

Specific operational methodologies include: stakeholders' sensitization workshops; scientific live-shows; seeing-is-believing travelling workshops; agricultural exhibitions; outreach to relevant parliamentary committees and policy-makers; and expanding capacities for media reporting, science communication, and biosafety regulatory systems. A cross-cutting activity is simplifying scientific materials through repackaging and translating into local languages to suit Africa's diverse audience.

ECABIC

Since its inception in 2001, East and Central Africa BIC (ECABIC), working with local and sub-regional partners has strategically executed project activities within its mandate through a number of interventions including communication and policy outreach, capacity building for science communicators, regulators and the media, and, knowledge-sharing through fostering exchange of information and networking. Notable achievements include: facilitating the drafting of the Kenya Biotechnology Policy and Biosafety Bill; enhancing parliamentarians' understanding of biotech issues through seeing-is-believing travelling workshops, hands-on training of several journalists with increased balanced media coverage; synthesizing, packaging and disseminating stakeholder-specific information; and demystifying biotechnology through scientific life-show demonstrations and exhibitions. As a result of the outreach program, there has been increased demand for biotech-derived products in eastern Africa such as tissue culture banana and fast growing trees, as well as better understanding of the relevance of on-going confined field trials of Bt cotton and maize respectively.



In 2007, the Center provided a successful coordinative role to the Biosafety Consortium, a stakeholder-driven process of catalyzing enactment of the Kenya Biosafety Bill which went through a highly informed debate in parliament but was time-barred when parliament was dissolved before final voting. Another lead role has been in the drafting of a National Awareness Creation Strategy (2007-2012) under the Kenya BioAware initiative of the Ministry of Agriculture. The strategy provides a framework within which

specific actions will be undertaken to promote awareness, provide a knowledge base for decision-making and hasten development of biotechnology in Kenya. A key milestone in 2006 was the launching of the Open Forum on Agricultural Biotechnology (OFAB), a joint collaborative venture between the Center and the African Agricultural Technology Foundation (AATF). OFAB addresses the need for strengthening inter-institutional networking and sharing of credible, sound and factual biotechnology information in Kenya and the sub-Saharan region. In a span of one year, 10 luncheon fora were organized, providing an opportunity for a wide range of stakeholders to interact, share knowledge and experiences, make new contacts and explore new avenues of bringing the benefits of biotechnology and science and technology in general to agricultural development in Africa.

Production and dissemination of focused materials on biotechnology and biosafety is one of the core business areas of ECABIC. The materials are targeted at high level policy-makers, parliamentarians, regulators, consumers and the general public. These include the publication of policy briefs, Pocket Ks and message maps to contribute to a better understanding of the various concerns related to modern biotechnology and biosafety. These serve as quick references for parliamentarians and high-level policy-makers. Two Pocket Ks on "Highlights of Kenya National Biotechnology Development Policy" and "Contribution of Agricultural Biotechnology in Alleviation of Poverty and Hunger," and a policy brief summarizing contents of the Biosafety Bill were published and appreciated by a wide range of stakeholders who could not grasp the technical jargon in the actual policy and draft Bill. The Center mobilized support for the Biosafety Bill by reaching out to relevant parliamentary committees and building a strong team of champions to ably defend the Biosafety Bill from a point of knowledge. This entailed confidence-building through increased interactions between parliamentarians, local experts, and high level policy-makers to enhance their understanding of key issues covered by the Bill.

Exposure for parliamentarians and policy-makers is fundamental in changing mindsets and enhancing

informed decision-making. The Center, in collaboration with the Kenya Agricultural Research Institute (KARI), AfricaBio and the African Biotechnology Stakeholders Forum (ABSF) conducted several 'seeing-is-believing tours' for parliamentarians, policy-makers, regulators, the media and other stakeholders. The tours are meant to expose, create awareness, and educate relevant parliamentarians and other key stakeholders on the institutional, technical and human capacities available in the region for responsible and safe research, development and commercialization of biotech crops.



ECABIC is recognized for building the capacity of the media in science communication and scientists on media relations to bridge the knowledge gap between scientists and the public. Scientists and journalists are trained on effective communication and accurate reporting of issues related to biotechnology developments and biosafety on a regular basis.

Mali BIC

In Francophone West Africa, ISAAA has worked with several partners on various biotech outreach initiatives. Since 2003, a biotechnology information center was established in l'Institut d'Economie Rurale (IER) in Mali to distribute science-based information on GM crops. The center, together with local collaborators implemented a communication strategy during the 2005 Ministerial Conference on Agricultural Biotechnology held in Bamako. A major outcome was the formation of RECOAB - the Réseau des communicateurs Ouest-africains en Biotechnologie Agricole, a network of journalists reporting on biotechnology. The network provides a forum

through which journalists can share sources of information, discuss the credibility of sources and receive feedback on their work from their peers. RECOAB serves as a point of contact for organizations wishing to communicate with journalists and the public on biotechnology in the sub-region. Member journalists have developed competencies in the area of biotechnology reporting and gained credibility in the sub-region on covering the subject. They have also been able to cultivate relationships with representatives from the government, research institutes, universities and non-government organizations (e.g. FARA, INERA, IER, ECOWAS). Country coordinators for Burkina Faso, Benin, Cote d'Ivoire, Chad, Mali, Niger, and Senegal have been identified. A major development was the start-up of a RECOAB coalition in Anglophone West Africa with active members from Ghana, The Gambia, and Nigeria.



Other key achievements in the sub-region include capacity building for spokespersons in Mali through the Consultative Group on Biotechnology and in Burkina with BBA where scientists and government technocrats have been trained on basic principles of risk communication and additional tools to respond to common questions about biotechnology. Exposure tours for different stakeholders in the sub-region including farmers, parliamentarians and the media to the Bt cotton trials in Burkina Faso has helped build the confidence on the technology among these teams and increased acceptance.

A key milestone is the production of a monthly biotech bulletin with the Burkina



Biotech Association (BBA). Biotech ECHO is the first of its kind in the sub-region and is edited by Professor Alassane Sere, a former Minister (Animal Resources) in the Burkina cabinet and also President of BBA. The bulletin features both news and feature articles based on local activities and less than 25 percent of content is of international origin. The Newsletter has received very good reception from recipients and rated as one of the most credible source of easy-to-read biotech information in French for the region. Even the media depends on it for story leads.

Egypt BIC • **Ismail Abdel Hamid**

Egypt Biotechnology Information Center (EBIC) is a not-for-profit center, established jointly between the Egyptian Ministry of Agriculture and Land Reclamation, and ISAAA. EBIC is located at the Agricultural Genetic Engineering Research Institute (AGERI), Agricultural Research Center (ARC).

EBIC's mission is to inform and promote public awareness of biotechnology. It works as a link between scientists and the public by simplifying scientific information for various audience levels. It also clarifies both benefits and potential risks through open and transparent discussion. EBIC plays an important role by gathering stakeholders in local, regional, and international scientific discussion and activities. Such workshops enable a variety of ideas, scientific perspectives and strategic points to be explored and discussed. A case in point is an inter-Islamic country workshop done through the collaborative efforts of ISAAA, the Islamic Educational, Scientific and

Cultural Organization (ISESCO), Organization of the Islamic Conference (OIC) bank, and EBIC to discuss challenges of biotechnology. Media specialists participated in a seeing-is-believing program organized by EBIC which enabled them to visit South Africa and explore the importance of biotech crops. Another visit to Pakistan was facilitated where media specialists from different Islamic countries discussed the possibilities for commercialized biotech crops.

EBIC has an Arabic newsletter called Roayaa that covers issues about biotechnology and its applications to agriculture. It also started and continues

to be the first Arabic website to explore the most updated information in agricultural biotechnology.



ISAAA South Asia Office

• **Bhagirath Choudhary**

ISAAA's principal office in India established in August 2004 is co-hosted by the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) in its premises at New Delhi, India.

In a very short period of over three years, the ISAAA program in India has successfully built and very effectively spearheaded knowledge sharing and biotech capacity building programs for diverse stakeholders ranging from policy-makers, scientists, regulators, journalists to farmers. It has effectively engaged print and electronic media practitioners in a constructive dialogue and received enormous media mileage on new cutting edge crop technology, that has potential to directly benefit small and marginal farmers in India. Extensive outreach media programs in different languages resulted in getting an unprecedented amount of positive media exposure and coverage for crop biotechnology through various activities including media workshops, interviews, articles and regular briefings. In order to keep them up-to-date on biotech developments, ISAAA along with ICRISAT runs a discussion group on agri-biotechnology, linking scientists, journalists and other stakeholders. More than 100 journalists

participate in the discussion group from around 10 countries in South Asia and Africa. ISAAA also regularly supplies latest information on crop biotech and biofuels through its weekly e-news services such as Crop Biotech Update and Biofuels Supplement.

ISAAA South Asia Office has successfully engaged in extensive outreach work program with many stakeholders from elected policy-makers, government officials, scientists, extension workers and farmers at both the national and state levels. It has also produced biotech documentaries, developed a range of publications, and organized programs in different local languages to provide easy-to-comprehend and credible information to all stakeholders.



All outreach programs are designed and executed in collaboration with public sector institutions and not-for-profit organizations. Some of

the collaborators in India include ICRISAT, Indian Agricultural Research Institute (IARI), Indian Society for Cotton Improvement (ISCI), Biotech Consortium of India Ltd (BCIL), Asian Media Information and Communication Center (AMIC), Karnataka Media Academy (KMA), Tamil Nadu Agricultural University (TNAU), Delhi University, Directorate of Rice Research (DRR), Punjab State Council for Science and Technology and Ministry of Environment and Forest (MOEF). In a short time span, the impact of its knowledge sharing and biotech outreach activities in India is far-reaching and visible.



Keeping in view the importance of ISAAA activities, it has been increasingly receiving funding and institutional support from the local public and private sector organizations in India including the Ministry of Environment and Forest, Barwale Foundation, JK Agri-Genetics and Rasi Seeds. The following major achievements in 2007 deserve noting:

- The International launch on January 18, 2007 followed by a press conference for print and electronic media in New Delhi. These events generated more than 150 news articles and generated 107 million impressions alone in India as compared to around 1100 articles and 550 million impressions globally for 2007;
- ISAAA India office organized the ISAAA Board Meeting, for the first time in India at New Delhi;
- ISAAA India office organized the ISAAA Board members visit to the Central Institute for Cotton Research (CICR) Regional Station in Sirsa, Haryana State and visits

to Bt cotton farmers fields in Sirsa District of Haryana State, and to experimental fields of Hybrid rice at the Indian Agricultural Research Institute (IARI), New Delhi; and

- ISAAA India office facilitated the first technology transfer project – Papaya Ringspot Virus-Resistant (PRSV-R) Papaya technology from Monsanto to the Tamil Nadu Agricultural University (TNAU) Coimbatore.

The remarkable story of Bt cotton, the first commercial biotech crop introduced in 2002, goes along with the ISAAA's unprecedented program in India. Surprisingly, it is the fastest adopted crop technology in the recent history of Indian agriculture. ISAAA estimates that around 3.8 million small and marginal farmers have planted Bt cotton hybrids over 6.2 million hectares or about 66 percent of total cotton area of India in 2007.



Knowing Bt cotton has delivered multiple benefits to farmers, agriculture and ecology, a large number of biotech crop products are at various stages of development in India. Both public and private sector institutions are incorporating different and stacked biotech traits in vegetables and other food crops in order to provide most advanced biotechnology in the simplest form as seeds to farmers. These traits include insect resistance, virus and fungal resistance, effective weed control through herbicide tolerance, salinity and drought tolerance, yield improvement, nutritional enhancement and delayed ripening for increased shelf life. Keeping in view the potential of these products to increase agricultural productivity and environmental sustainability,

it is important that these products are made available to small and marginal farmers without hassle and unnecessary delay. More importantly, ISAAA's outreach and communication work across India will remain critical especially when Bt Brinjal (Eggplant) and Bt Rice are finally released in the not-too-distant future. Being the first biotech food crops to undergo public scrutiny, it will most certainly need effective parallel communication efforts to ensure public acceptance. ISAAA India office assumes a significant enabling role in ensuring early deployment of these potential technologies to Indian agriculture.

Therefore, ISAAA India office continues to implement its national level knowledge sharing and biotech outreach activities in alignment with the proposed State level activities. Besides publications and capacity building programs through media workshops and briefings, this includes continuously highlighting crop biotech developments in India in ISAAA's flagship annual review on the global status of commercialized biotech/GM crops commonly known as ISAAA Brief and through the Crop Biotech Update and Biofuels Supplement.

MABIC

• Mahaletchumy Arujanan

The Malaysian Biotechnology Information Centre (MABIC) is a registered not-for-profit organization with a non-government organization (NGO) status in Malaysia. MABIC is the first and only NGO that promotes biotechnology in Malaysia and enjoys excellent working relationship with ministries, government agencies, research institutes, universities, trade organizations, embassies and high commissions, media, industry and farmer organizations. As a well-recognized information center, MABIC strives to ensure that all its information and activities are scientifically sound. In order to uphold the scientific integrity, an advisory committee is in place to advice and review MABIC's activities and plans. The advisory committee is made of top scientists and stakeholders who are highly respected in their respective fields and represents the scientific community, industry, policy-makers, media, academe, and legal fraternity.



MABIC organizes an average of 12 events every year with an objective to create awareness on various issues that are pertinent to the growth of biotechnology in the country. Events are organized for scientists, students, policy-makers, members of the media, and religious authorities. MABIC has also been successful in initiating international events. Two such events were organized in Cairo, Egypt and Islamabad, Pakistan on "Development of Biotechnology in Islamic Countries" and "Journalists Exchange Programme: Reporting on Agricultural Biotechnology," respectively. Funds for these events were obtained from international organizations such as the Islamic Educational, Scientific and Cultural Organization (ISESCO) and Organization of Islamic Conference (OIC) Standing Committee on Scientific and Technological Cooperation (COMSTECH). These events were milestones for MABIC as it was able to reach out to audiences beyond Malaysian soil and gained recognition and facilitated the participation of Malaysian stakeholders in these events where sharing of experiences took place.

Another key objective achieved by MABIC in recent years was the ability to garner both in-kind and financial support from outside ISAAA to run its activities. Collaborators are often more than keen to support MABIC's activities due to its strength in sourcing for excellent speakers (both local and international), strong technical and scientific input, and the success in gaining publicity for the event. In return for these

contributions, MABIC enjoys the privileges of getting free venue and logistics support for the events it spearheads. In certain instances, MABIC receives a modest honorarium as a token of appreciation for its services. These funds are channeled back to MABIC's activities. Further to local support, MABIC has also managed to forge new working relationship with Australia Malaysia Institute (AMI) that has served as a donor for several MABIC activities.

Over the years, MABIC has managed to be the top biotechnology information portal with its website. Together with the website and the outreach programmes organized, MABIC has remained as the single most active organization in creating public awareness and addressing key issues in biotechnology to Malaysian stakeholders. Besides these activities, MABIC sits on several committees that advises the government on biotechnology and its executives get invited as speakers and resource persons.

As a balanced biosafety regulatory framework could be a rate-limiting factor in creating a conducive environment for research, commercialization and in attracting foreign investment, MABIC has taken a keen interest in educating



stakeholders in this area. Workshops and conferences were organized with international experts as resource persons. MABIC works closely with the Malaysian Biotechnology Corporation towards achieving this objective.

Another milestone project in the pipeline is the creation of a database which will enlist all biotechnology scientists in Malaysia with their profile and respective research area. This database will be the first of its kind in Malaysia which will enable stakeholders around the globe to search for collaborators and partners to undertake research activities and encourage sharing of experience and communication among scientists, industries and other interested parties.

PABIC

• **Muhammad Iqbal Choudhary**

The Pakistan Biotechnology Information Center (PABIC) has a strategic initiative to promote communication and knowledge about biotechnology in Pakistan. It aims to produce a better-informed citizenry who would be able to make informed decisions about aspects of biotechnology.

PABIC supports the establishment of an active network of science communicators of 27 institutes in Pakistan who gather and exchange experience and communication strategies with each other. Working groups are set up to draw up a catalogue of Best Practices, incorporating the success formulas for communication in the life-sciences especially in biotechnology-related research. The structure of this catalogue will be based on target groups and subject matter, and will

provide information in a form that can be immediately used by members of the network.

The Internet platform of PABIC contains educational materials about biotechnology-related research and links for target groups, and categorized by level of knowledge. Most of the publications and educational materials provided by ISAAA (translated in Urdu version) can be downloaded from the website. In addition, it will also contain a large virtual library with illustrative materials that can be downloaded free of charge.



SEARCA-BIC

(Philippines)

• **Sonny Tababa & Rochella Lapitan**

When the Southeast Asian Regional Center for Graduate Study and Research in Agriculture Biotechnology Information Center (SEARCA BIC) was established, the first two weeks were spent in knowing the environments that it would be operating in namely, SEARCA, ISAAA, and the biotech arena in the Philippines. We needed to know then where to situate BIC among the many agencies doing biotech R&D and outreach activities. It was important to know what tasks had to be done first and for whom. The consultation workshop with key stakeholder groups was held a month after we became operational. We started with the local contacts that we had developed and maintained over the years. The consultation workshop helped us chart directions, prioritize activities, and identify strategies to reach out to stakeholders.

Collaboration and networking were very important. In 2000, a lot of attention and controversy brewed over genetically modified crops especially with the planned first limited trial of Bt maize in Southern Philippines. We knew then that the media, researchers, communication officers, and the local government units were our immediate concerns. Important stakeholders like the policy-makers at the national level, academe, and private sector were to be reached out mainly by our key partners who were also doing biotech outreach activities. By working together with partners who have their own extensive networks, more public sector agencies were tapped to support the biotech information campaign. In addition, pooling of resources enabled more activities to be conducted across geographical locations and stakeholder groups. Local coordination of activities was also much easier. Collaboration is a win-win implementing strategy.

At the height of the Bt maize trials, our seminars were held in potential field trial sites. We invited agriculture and fisheries committee members, potential institutional biosafety members, farmer-leaders, and key community personalities. We had several media workshops, too.

Our message was fairly consistent.

Biotechnology can help improve farm productivity and can make our foods and environment safer. We needed our stakeholders to be informed, and to understand, appreciate, and use the products or services of biotechnology. Our topics included biotech 101, understanding GM crops and foods, safety aspects, and risk communication. As results of the field trials came in, the information on better yield and quality were included. With commercial planting of biotech maize, socio-economic aspects were also presented. Though we shared information on the experiences of other countries that decided to grow biotech crops, we observed that the interest of the participants perked more when presented with local data. Later, we complemented our person-to-person communication strategy by developing information materials, creating our website, providing electronic news service by covering Philippine media coverage on biotechnology-related developments, conducting visits to laboratories and biotech field trials and commercial biotech farms, and doing radio-based information sharing activities i.e. interviews, scripts, public service announcements, and plugs. We also distributed information materials developed by our partner agencies.



Eventually we increased our regional type of biotech outreach activities. With SEARCA's interest in biotechnology, we have gone into joint publications of monographs and books as well as co-organizing of conferences, seminars, and training.

We see more diversified biotech crops in the years to come. Some of these will be public sector-developed that would require a more deliberate approach to communication as the products

move from confined trials to multi-location field trials. Others will have three or more traits packed into a single crop. All these would need an adequate information campaign for the public to know and be able to decide for themselves the commercial fate of such products. As Plutarch said, 'This time, like all times, is a very good one, if we but know what to do with it.'



BBIC

• Supat Attathom

Thailand is one of the leading agricultural exporting countries. Introduction of modern biotechnology to improve the quality and quantity of agriculture production is deemed important. However, Thailand has to balance the use of technological development particularly genetic modification (GM) technology among various stakeholders. The main concern of policy-makers is how to protect the export markets where GM products are not yet welcomed.

The real challenge of Thailand Biotechnology and Biosafety Information Center (BBIC) is to provide information on modern biotechnology to concerned parties in the Thai language. At the initial phase (2000-2004), Thailand BBIC was affiliated with the National Center for Genetic Engineering and Biotechnology (BIOTEC) and much of the efforts were targeted for the science community. Today, it is hosted by the College of Agriculture, Kasetsart University, the

country's leading agricultural university. With this new arrangement, Thailand BBIC now actively participates in public education and communication via seminars, workshops, newsletters and website (www.safetybio.agri.kps.ku.ac.th). The concept of "Live Classroom" has proven to be a very effective strategy for public education, especially for farmers where GM plants can be observed and studied. This involves raising public awareness on biotechnology through a tour of research and development efforts related to biotech crops starting with the laboratory to field trial sites.



The case studies presented by some BICs highlight the on-the-ground activities that have increased efforts to communicate concepts and issues on biotechnology. Communication strategies are common across the BICs. However, what distinguishes each BIC is how they use these strategies in the light of the uniqueness of their respective political and policy environment, stakeholder level of interest, and priority messages.

A crucial question that needs to be answered is whether communication efforts have met the said objectives. Evaluating efforts and assessing impact need to be done.