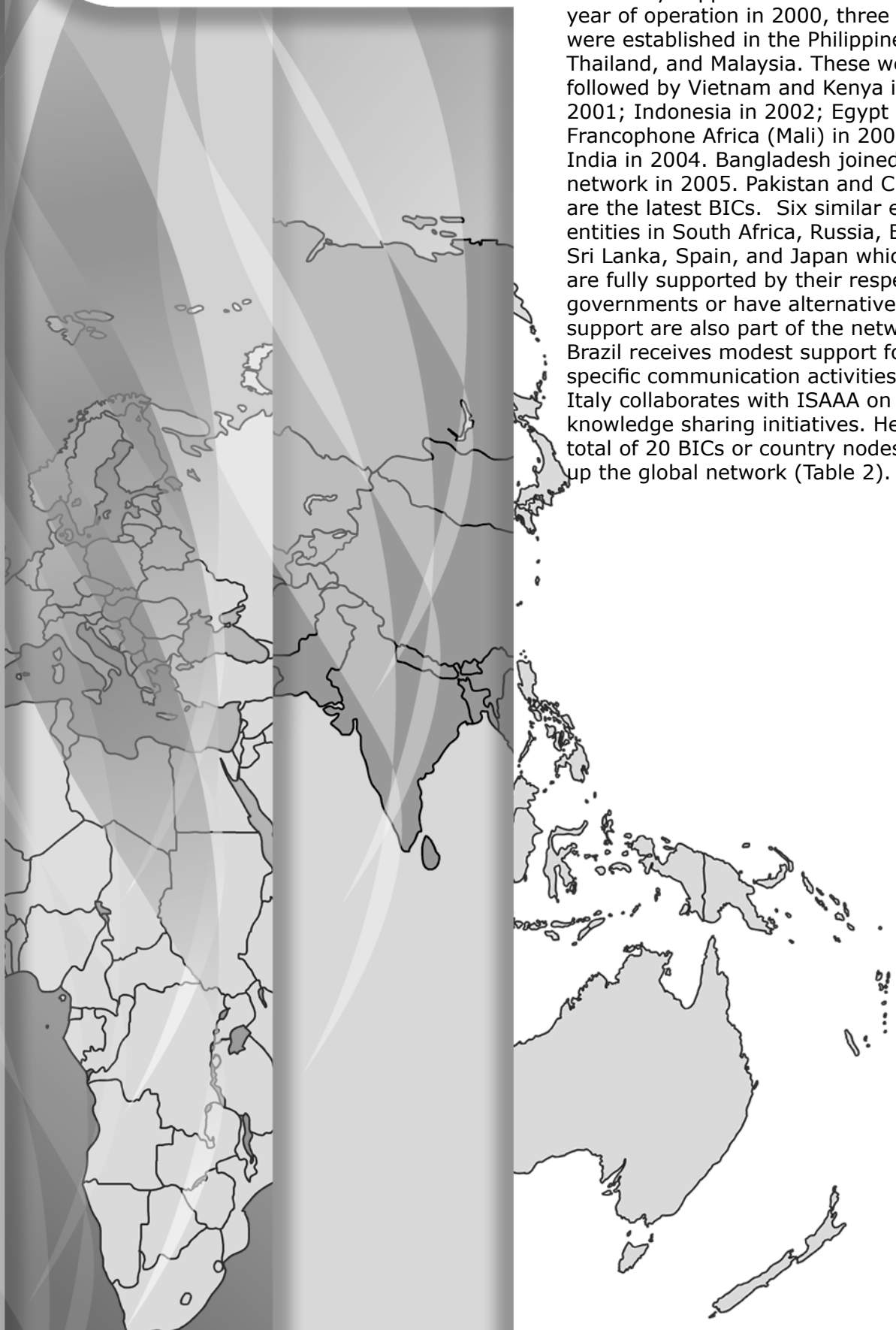
IV Biotechnology Information Centers (BICs)



The heart and soul of the Global Knowledge Center on Crop Biotechnology (KC) is its growing network of Biotechnology Information Centers (BICs) or country nodes in Africa, Asia, Europe, and Latin America. At the moment, the KC has a network of 12 fully supported BICs. In the initial year of operation in 2000, three BICs were established in the Philippines, Thailand, and Malaysia. These were followed by Vietnam and Kenya in 2001; Indonesia in 2002; Egypt and Francophone Africa (Mali) in 2003; and India in 2004. Bangladesh joined the network in 2005. Pakistan and China are the latest BICs. Six similar existing entities in South Africa, Russia, Bulgaria, Sri Lanka, Spain, and Japan which are fully supported by their respective governments or have alternative funding support are also part of the network. Brazil receives modest support for specific communication activities while Italy collaborates with ISAAA on its knowledge sharing initiatives. Hence, a total of 20 BICs or country nodes make up the global network (Table 2).

Table 2. *Summary of Biotechnology Information Centers or Country Nodes*

REGION	COUNTRY	OFFICIAL NAME	HOST INSTITUTION	YEAR
ASIA	Philippines	SEARCA Biotechnology Information Center (SEARCA BIC) URL: http://www.bic.searca.org/	Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), Los Baños, Laguna	July 2000
	Thailand	Biotechnology and Biosafety Information Center (BBIC) URL: http://www.safetybio.com/	College of Agriculture Kampaengsaen, Kasetsart University, Nakhon Pathom	July 2000
	Malaysia	Malaysian Biotechnology Information Centre Berhad (MABIC) URL: http://www.bic.org.my	Monash University Malaysia Jalan Lagoon Selatan, Bandar Sunway, Petaling Jaya, Selangor	December 2000
	Vietnam	Agbiotech Vietnam URL: http://www.agbiotech.com.vn/vn/	Science and Technology Information Service AgBiotech Vietnam, Trung Yen New City, Trung Hoa Precinct, Can Giay District, Hanoi	November 2001
	Indonesia	Indonesia Biotechnology Information Center (IndoBIC) URL: http://indobic.biotrop.org/	Southeast Asia Regional Centre for Tropical Biology (SEAMEO BIOTROP), Bogor	October 2002
	India	ISAAA South Asia Office	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), NASC Complex, Dev Prakash, Shastri Marg, New Delhi	August 2004
	Bangladesh	Bangladesh Biotechnology Information Center (BgBIC) URL: http://www.bgbic.org	Bangladesh Agricultural University, Mymensigh	February 2005
	Pakistan	Pakistan Biotechnology Information Center (PABIC) URL: http://www.pabic.com.pk	International Center for Chemical and Biological Sciences, Latif Ebrahim Jamal Research Institute of Chemistry, University of Karachi, Karachi	June 2006
	Sri Lanka*	Biotechnology Education and Information Center (BEIC) URL: http://www.slbic.org	Department of Plant Sciences, Colombo University, Colombo	June 2007

Table 2. *(continued)*

REGION	COUNTRY	OFFICIAL NAME	HOST INSTITUTION	YEAR
ASIA	China	China Biotechnology Information Center (CABIC)	China Biotechnology Society Beisihuan Xi Lu, Zhong Guan Cun, Beijing, Peoples Republic of China	February 2008
	Japan*	Nippon Biotechnology Information Center (NPBIC)	NPO Hokkaido Bioindustry Association (HOBIA) c/o Hokkaido Collaboration Center, Sapporo, Japan	April 2008
AFRICA	South Africa* (node)	AfricaBio URL: http://www.africabio.com	AfricaBio, Centurion, Pretoria	January 2001
	East and Central Africa (c/o Kenya)	East and Central Africa Biotechnology Information Center (ECABIC) URL: http://africenter.isaaa.org/	ISAAA *Afri*Center, c/o International Potato Center (CIP), International Livestock Research Institute (ILRI) Campus, Nairobi	July 2001
	Egypt	Egypt Biotechnology Information Center (EBIC) URL: http://egypt-bic.com	Agricultural Research Center, Agricultural Genetic Engineering Research Institute (AGERI), Giza, Cairo	March 2003
	Francophone Africa (c/o Mali)	Mali Biotechnology Information Center	Institut d'Economie Rurale (IER), Bamako	June 2003
EUROPE	Russia*	Russian Biotechnology Information Center (RUBIC)	Centre for 'Bioengineering' Information Division on Biotechnology, Russian Academy of Sciences, Moscow	January 2004
	Bulgaria*	Bulgaria Biotechnology Information Center	AgroBioInstitute, Dragan Tsankov Blvd., Sofia	January 2004
	Spain*	The Center for Information on Biotechnological Innovations /El Centro de Informacion en Innovacion Biotechnologica (IBERCIB) URL: http://ibercib.es	Ibercaja, Zaragosa	April 2007
	Italy (node)*	Fondazione Bussolera Branca	Fondazione Bussolera Branca, Mairano di Casteggio	January 2008
LATIN AMERICA	Brazil (node)+	Celeres	Celeres Eng Helvio Felice, Uberlandia, Minas Gerais, Brazil	October 2007

*Fully funded by their governments or have own funding sources
+Funding provided by ISAAA for specific communication projects

Figure 2. *Map of Global Knowledge Center on Crop Biotechnology and BICs*

ISAAA also maintains links with other groups such as the Burkina Biotech Association in Burkina Faso, and Echos du Sahel in Niger. Figure 2 presents a graphical representation of the network.

Objectives. In general, the BICs are at the forefront of responding to scientific information needs, and in promoting and advancing a broader public understanding of crop biotechnology in their respective countries. They are now recognized in their respective countries as a major source of crop biotechnology information.

The BIC in the Philippines is hosted by a regional organization that covers Southeast Asia. It states its main goal as addressing the needs of the Southeast Asian region for a highly credible, sound, and factual biotechnology information resource center which is accessible to various stakeholders. Specifically, its objectives are to:

- Serve as a hub of the regional network for current science-based information on agricultural biotechnology;
- Support national programs on agricultural biotechnology by providing strategic information for decision-making;
- Act as information broker among various stakeholders;
- Coordinate with regional and national network nodes on the exchange, processing, packaging and distribution of agricultural biotechnology information; and
- Synthesize and package science-based information using appropriate formats for various stakeholders.

Other BICs follow similar objectives attuned to specific country-specific information needs and stakeholder requirements. It is important to note that each BIC has flexibility to plan realistic objectives to increase the chance of success in meeting set goals. From the general statement of objectives, each BIC is encouraged to formulate more specific, achievable, and measurable ones.

Stakeholders. The identification of priority stakeholders is based on the specific realities and conditions as well as information needs in a particular country or region. However, the primary audience consists of scientists, academics,

policy-makers or opinion leaders, media, government authorities and the private sector. Due to the multiplier effect of communication, the 'general public' is eventually reached. A survey of information channels in some countries suggests the need to reach out to faith-based and other religious officials who are also perceived as sources of information.

Since the state of biotechnology and stakeholders' interests and information needs vary, identifying and prioritizing the different publics or audiences must be a top concern. Thus from a working concept of a 'general public,' it is necessary to consider sub-groups, each of whom needs specific information requirements, and communication styles and formats. It is important to customize communication strategies for these audiences to maximize impact.

Table 3 is a guide to determine potential targets and specific needs using some examples advanced by Lisa Watson (2002).

Institutional arrangement. Fully-funded BICs are hosted by either public or private institutions to enable them to integrate with the local system, receive administrative and logistical support, and provide a home base for operations. Some of the BICs are hosted by international organizations based in the mother country. Examples are the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) which hosts the Philippine BIC, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) for India, Southeast Asia Regional Centre for Tropical Biology (BIOTROP) for Indonesia, and International Potato Center (CIP) for Kenya. Academic institutions host other BICs such as Monash University (Malaysia), and Bangladesh Agricultural University, while government research and development institutions also host BICs such as in Egypt, Mali, Pakistan, and Thailand.

A newly established BIC seeks a host institution that would provide the best support for its existence. Often, a host institution that supports the objectives of the BIC and provides logistical support with minimum bureaucratic limitations is chosen. In the case of some BIC heads that are affiliated with some institutions, i.e. academic or research and development agency, the choice is often dictated by this situation.

A Memorandum of Agreement is signed between the host institution and ISAAA to formalize the organizational arrangement. Based on the level of integration into the system, the BIC can either be made part of the host institution as exemplified by the case of the Philippines or as an independent entity paying rent and support services to the host institution such as those in India and Kenya. In the case of Malaysia, it is hosted by a private university but has decided to gain legal status in the country as a non-profit organization to source external funding support.

Philippines

The host institution of the Philippine BIC is SEARCA. In 2000, it convened a Regional Conference on Agricultural Biotechnology in Bangkok, Thailand to discuss a regional "enabling environment" for an effective and safe utilization of agricultural biotechnology in Southeast Asia. The participants, composed of policy-makers, senior scientists and officials from both government and the private sectors, recommended support for capacity building, international cooperation, and information sharing.

At about this time, ISAAA had also just conceptualized the Global Knowledge Center on Crop Biotechnology, an information network. The directors of SEARCA and ISAAA agreed to establish a biotechnology information center. Organizationally, the BIC is now part of the Knowledge Management Unit of SEARCA and has in addition to its BIC functions, duties to support the objectives of the host institution.

India

ICRISAT was identified as a host due to its commitment to biotechnology and the willingness of both heads of agencies to support the knowledge sharing initiative. ICRISAT provides administrative support services in addition to leasing space for the BIC's office and the use of office amenities such as network connectivity and communication facilities. The

Table 3. *Characteristics of Some Potential Information Center Targets*

POTENTIAL TARGETS	IMPORTANCE OF TARGET	NEEDS OF TARGET
Media	• Most effective means of reaching consumers	• Business, agriculture, health, and consumer media interested in aspects of biotechnology • Need to provide succinct, easily accessible, usable, referenced, timely biotech information
Academics	• Frequently used as resource by media	• Need technical information to ensure they understand and can stand behind the science beyond their specific area of expertise • Often need coaching on translating technical information into terms that the public can understand
Government bodies	• Appropriate groups within the government need to be aware of consumer education initiatives • Government bodies will be interested in developments and commitments to biotechnology both in-country, as well as in other parts of the world	• Information from the government on regulatory approach, safety assessment, research initiatives and other relevant information are important parts of outreach programs
Food/Feed Industry	• This broad category includes all groups from farm to plate, from growers to producers and processors to retailers • The food/feed industry is very much affected by developments in biotechnology, so it is critical that they understand ongoing initiatives that may impact public awareness	• The food/feed industry should be aware of consumer education materials and initiatives that can help them respond to questions from and the needs of their ultimate customers • In some cases, segments of this category are willing to participate in or share information that will be helpful to the overall educational initiative
Consumers	• Consumers are the ultimate target of educational outreach efforts, but it is likely to be more cost-effective to reach them through the groups identified above rather than directly	• Materials need to be written in simple, easy-to-understand language, without jargon

Source: Lisa Watson, 2002

Memorandum of Agreement, signed by the heads of both institutions likewise stipulated ICRISAT's facilitation in the appointment of an ISAAA National Coordinator, creation of an Advisory Committee, and provision for assistance in ISAAA activities. The MOA enabled collaborative activities to be organized with ICRISAT such as media workshops where experts are tapped to be resource persons, and the publication of a book on writing for crop biotechnology.

Malaysia

A non-government organization called Tropical Fanfare Berhad initially performed the tasks of a BIC in Malaysia but was eventually hosted by an academic institution. Monash University Malaysia was deemed as a better alternative since the university was conducting both education and research in biotechnology and that by working together, could lead to "outputs of higher impact at minimized duplication and reduced costs." Hence, a Biotechnology Resource Center was set-up. The Memorandum of Agreement, signed by the Monash Pro-Vice Chancellor and the ISAAA Director, stated that Monash would provide in-kind support by hosting the Center and providing an appropriate office at its campus; appoint the staff; and assist in creating an Advisory Committee to guide the Center. Five years later, the BIC decided to register MABIC as a non-profit organization ("company limited by guarantee and not having a share capital") to operate for educational and scientific purposes, particularly to facilitate the transfer of agricultural biotechnology applications from industrial countries for the benefit of Malaysia; assist Malaysia to assess the benefits and risks of the technology, including environmental and biological safety; and to promote, arrange, organize and conduct conferences, meetings, discussions, seminars and research. This legal arrangement thus enables MABIC to solicit and receive additional funding or resources to meet its objectives.

Egypt

The government's Agricultural Research Center's Agricultural Genetic Engineering Research Institute (AGERI) hosts the BIC. AGERI's mission is to develop a biotechnology center that "has a high credibility as a sound, factual resource among leaders, government officials, the media and the public" and through the network it forms can serve as the focal point for agricultural biotechnology education outreach initiatives. The Memorandum of Agreement signed by the Vice President Supervisor of AGERI and the ISAAA director, stipulates that AGERI would thus provide in-kind support by hosting the Center, appoint the staff, and determine the composition of its External Advisory Committee.

Other Countries

For BIC-like entities which do not receive funding, a proposal to be part of the network is given to ISAAA for consideration. Sri Lanka, Bulgaria, Russia, and Japan for instance, rely on collaborative partners like ISAAA which is committed to share information resources. AfricaBio in South Africa shares a common goal of providing accurate information on biotechnology to key stakeholders and providing regular fora for exchange of information. Through a Letter of Agreement signed by the heads of AfricaBio and ISAAA, it was agreed that AfricaBio in being part of the network, serves as a point of contact for biotechnology and biosafety communication and information activities in South Africa. In turn, ISAAA provides information materials in electronic format for the use of AfricaBio for translation and dissemination purposes. When there are common or specific projects or activities, however, agreements can be made to share costs. In the case of Sri Lanka, the BIC is a collaborative effort with several partners. The University of Colombo provides office space, faculty, and resources; and the Michigan State University sponsors biotechnology specialists for in-country training courses and assists in the development of online courses and modules. ISAAA in turn, contributes biotech information resources.

Funding sources. ISAAA provides a core budget for the BICs that it fully supports. This budget is based on donor allocations, hence, some BICs might receive more than others because of the perceived importance of initiatives or identified activities in certain countries. Funds are allocated for specific projects

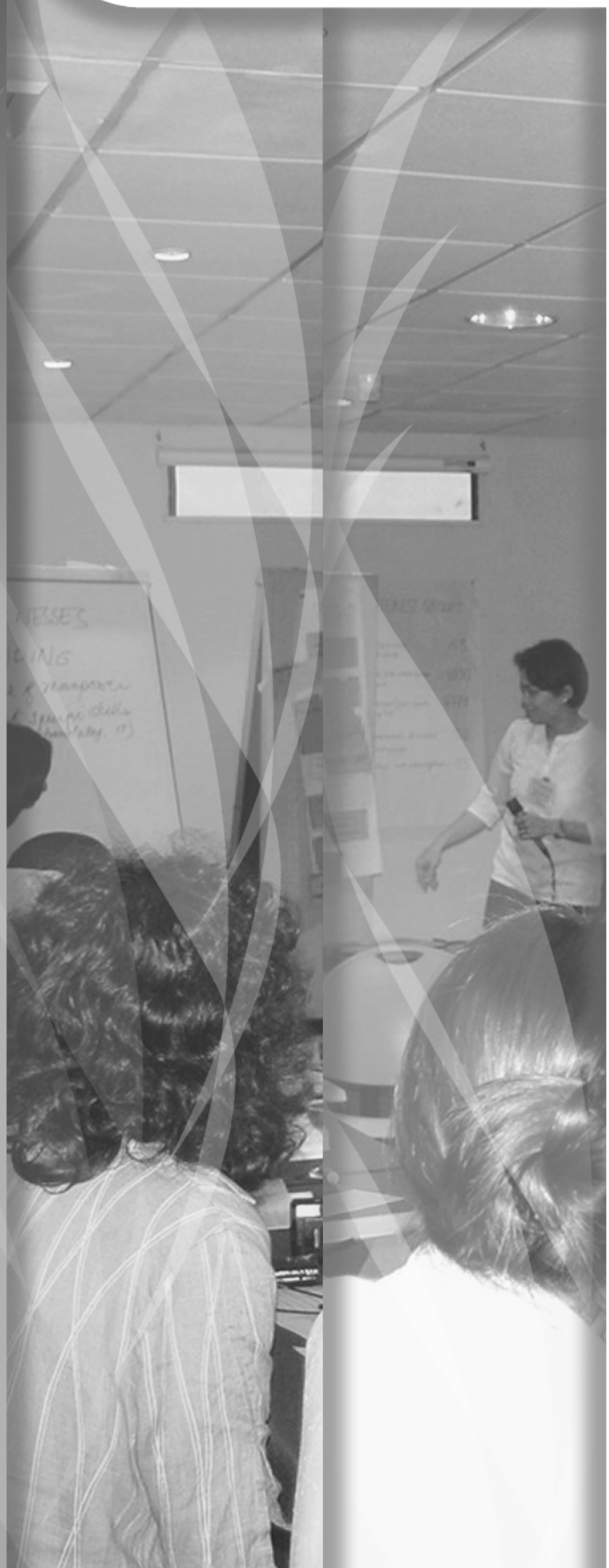
such as information dissemination and networking activities as well as workshops and seminars. In augmenting resources, BICs are encouraged to submit proposals to other public and private institutions to co-fund projects. Resources can be non-monetary or in kind such as workshop venue, meals, supplies, and resource persons. Funding can be specific for certain activities such as the conduct of workshops, development of a publication, or a study visit.

Personnel. Most of the fully-funded BICs are headed by a competent person with a title like Executive Director, Network Administrator, or National Coordinator who work full-time on the job. Other BIC heads work part-time in addition to a full-time job with the host institution. For example, a BIC head works concurrently as a full-time professor or as a deputy director of the host institute. The BIC head supervises and oversees the operations of the Center. He/she is assisted by an additional full-time staff or part-timers who are employees of the host institution. The staff might be a writer, website developer or performs multiple tasks. In case of special activities, some BICs employ student assistants or request collaborating institutions for manpower during activities such as workshops and seminars.

Activities. Cognizant of specific conditions in each of the country coupled with level of awareness, and political and cultural differences, the individual BIC is at liberty to determine the best combination of communication strategies that would efficiently accomplish its main objective of fostering a science-based debate on crop biotechnology. Major activities of the BICs include networking with key stakeholders, workshops and outreach activities, and translation and development of communication materials using the tri-media including electronic mode. Minimum outputs include a profiled mailing list of subscribers/recipients of communication outputs, submission of news for the weekly e-newsletter Crop Biotech Update, and translation of publications.

An understanding of the context of communication, biotechnology, and the environment in which they thrive segues to the detailed process and concerns of biotechnology communication.

V Understanding Stakeholders



In order to guide the Global Knowledge Center on Crop Biotechnology (KC) and the Biotechnology Information Centers (BICs) in planning for specific communication strategies, it is important to understand their various audiences and how they respond to issues and concerns about crop biotechnology. Some of the methods for determining public perception include focus groups, surveys or stakeholder analyses, and media monitoring. A review of secondary data, i.e. publications, reports, and proceedings, is also important to "scan the environment" to assess developments in crop biotech.

The focus group or group interview is a strategy for understanding audience attitudes and behavior. It enables a clearer understanding of identified stakeholders. Based on the objective of the exercise, a small group of people (6-12) are gathered together and insights are obtained by carefully asking key questions. A moderator leads the group in a relatively unstructured discussion about the main topic. Answers to the questions are validated with the rest of the group to gather a more general perspective of public opinion. In formulating objectives and activities of the KC during its initial year, a small group of experts were invited to brainstorm concerns such as scope of involvement and audience prioritization.

Survey. Public perception and attitude surveys provide sources of benchmark information and glimpses from findings that are "mined" and analyzed. These can be implemented through mail, telephone or internet surveys. Personal (face-to-face) interviews can also be done where a respondent is invited for a one-on-one dialogue. These strategies have their own advantages and disadvantages but Wimmer and Dominick (2006) noted that from their experience in the United States, personal interviews have a 40 percent response rate, telephone surveys 10 to 75 percent, Internet 1 to 30 percent, and mail surveys 1 to 4 percent. ISAAA's experience in using e-surveys shows a 0.5 percent return. While this percentage of return may seem insignificant, the survey gives a profile of readers and provides varied feedback.

ISAAA in collaboration with the University of Illinois conducted a five-country

study in 2002 to determine public understanding, perception, and attitude towards agricultural biotechnology. Representing the public as stakeholders were eight sectors, namely, policy-makers, journalists, scientists, farmer leaders and community leaders, extension workers, consumers, businessmen and traders, and religious leaders. Responses were sought to the following questions:

1. What do stakeholders generally know or understand about agricultural biotechnology?
2. What are their views and opinions about the impact and role of biotechnology in their lives?
3. Where do they obtain information and what information or message contents do they get?
4. Who do they trust to tell the truth about biotechnology?

A follow-up study was conducted in 2005 in collaboration with the College of Development Communication of the University of the Philippines Los Baños to identify the prevailing trends concerning public understanding and perception of and attitude towards biotechnology in the Philippines and Indonesia. This study sought to describe the socio-cultural characteristics of the various stakeholders in agricultural biotechnology; identify their information sources; find out their understanding and perception of and attitude towards agricultural biotechnology; and determine the relationship between socio-cultural factors and stakeholders' understanding and perception of and attitude towards agricultural biotechnology.

A structured interview schedule was used to gather data although in the case where respondents such as policy-makers were not available for interview, self-administered questionnaires were used instead. The BICs were tapped to conduct the interviews for the specific country being studied. However, to answer specific audience concerns, the BICs can conduct their own surveys using a set of basic questions to provide benchmark data and validate assumptions for planning purposes. A literature review of public opinion studies is also useful to determine public understanding and attitude over time. What then did the surveys reveal that can help in making a communication plan? It validated the need for communication efforts as knowledge on biotechnology was low to moderate. Scientists were identified as credible and trusted sources of information while media was a source for many respondents on crop biotechnology (View the ISAAA survey at http://www.isaaa.org under the ABSP II section).

Media Monitoring. The news media can set the agenda for the public's attention to issues around which public opinion is formed. Hence, it is important to analyze what media considers important enough to write about. Media monitoring involves the "systematic register and review of what the media tells about the world" (Nordenstreng, 2001). BICs or network contacts scan national papers daily and analyze articles on crop biotechnology based on number of articles, topic of article, and tone (positive, negative, neutral). Other variables that can be analyzed include source of information cited by article, and biotechnology theme or story angle (cultural, economics, religious, political). Some of the questions that this study answers include:

1. What agri-biotech news stories come out in national newspapers during a given period of time?
2. What is the content (topic, common theme and tone) of news coverage for agri-biotech during the period of analysis?
3. Who is the source of the article?

Data gathered over time enables an understanding of what media considers as news so that the BIC can proactively react or anticipate media requests and coverage for agri-biotech articles. It also provides an idea of information sources so that the BIC can determine if it should increase its media visibility. Data from the Philippines, for instance, show that biotech news are covered by most national newspapers, although majority of articles are covered by the top three newspapers in the country. Navarro and Villena (2004) analyzed data from a media monitoring study in the Philippines. They found that an average of 25 articles was published monthly with majority of articles positive

in tone, supportive of government and private sector initiatives, and guided by social/cultural interest. The favorable media environment exists for agri-biotech in the Philippines even in 2008 data. In 2007, selected provincial or regional newspapers and online versions were also monitored. Initial results show that these local newspapers did not publish as many articles as broadsheets with the few articles mostly about low end biotechnology. This suggests the need to provide local papers with possible stories and or include them in media training programs and study tours.

A five-country monitoring study conducted by ISAAA in India, Malaysia, Philippines, South Korea, and Vietnam in 2003 showed sustained media coverage on crop biotechnology. Local journalists were writing about biotechnology and followed developments of important newsworthy milestones such as the approval of a GM crop as in the case of the Philippines and India.

Different methodologies are available to help establish a basis or foundation for understanding stakeholders. With a clear picture of the environment and users of information, the communication process can now be discussed in detail.

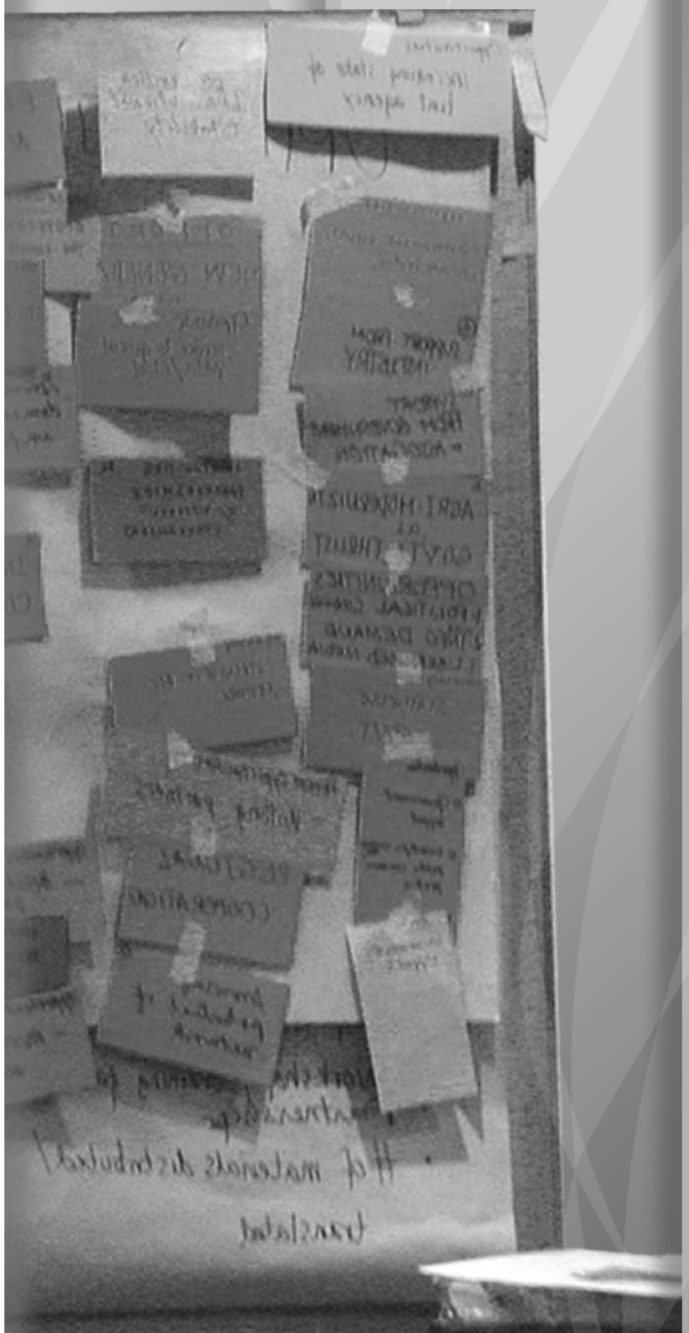
VI Designing a Communication Plan

A communication plan is a roadmap that charts the directions that an organization will take to reach its objectives. It is an important component to achieve goals that ensure organizational success. Among the reasons for the development of a communication plan is to clarify goals and objectives; explain relationships between audiences, messages, channels, and activities; identify accountabilities and deliverables; and evaluate outputs vis a vis objectives and goals.

Traynor et al. (2007) propose some preliminary tasks that have to be completed before preparing a strategic communications plan. These include the need to:

- Establish a working group to develop the communication plan. It can be composed of members with expertise in biotechnology and biosafety, communication, and project management;
- Identify scientists and technical experts who are knowledgeable about biotechnology, crop breeding, and related fields. The team can provide an overview of the science, the products available and those being developed, and safety issues and concerns;
- Analyze local and national information initiatives in the subject matter area to determine what strategies work and what does not, in terms of effective information delivery to specific audiences; and
- Conduct survey research to establish baseline data on current public perceptions about biotechnology to determine knowledge gaps.

A communication plan has greater potential for sustainability if it is developed *with* rather than *for* various stakeholders. This participatory approach enables a critical understanding of the social environment, a sensitivity to the needs and priorities of specific audiences, and a focused direction based on real time concerns. This systematic and strategic process encourages people to come together and cooperate, as well as initiate action on their own volition. A communication plan is never static or fixed but a dynamic, evolving one.



There are five important steps in implementing communication activities. The process is cyclical, as it involves a continuous flow of reassessment and refinement. Information obtained from the evaluation can be fed back to assessment and thus the process starts over again. Versoza (2003) enumerates these steps as:

Assessment. This stage involves obtaining information to guide the communication strategy. It identifies the behaviors desired, key messages, audiences or stakeholders to reach, the communication channels to reach the audience, and specific units to implement the communication activities.

Planning. A clear course of action is determined on the basis of the assessment earlier done. Decisions are made with regard to desired behaviors, key messages, audiences, communication channels, and activities including supporting elements such as budget, timeline, communication research plan, and a capacity building component.

Material development and pretesting. Production of communication materials entails working with the audience to develop messages that will be effective with them. Hence, messages must be clear and easy to understand, and culturally sensitive. Pre-testing of materials guarantees that materials developed for dissemination are designed for specific, identified stakeholders.

Implementation. This step involves distributing print material, broadcasting and television messages, and conducting interpersonal forms of communication. The delivery and distribution of communication materials whether through print, radio or television, or through interpersonal communication means depends not only on quality and timeliness, but also on availability of good supporting services.

Monitoring and evaluation. These are carried out simultaneously with implementation to determine audience response to messages, and subsequent changes in knowledge, attitudes, beliefs and practices. This process enables mid-course corrections and identifies new opportunities to improve the communication component. The final evaluation enables learnings to be used for future communication programs.

W.K. Kellogg Foundation's Communications Toolkit provides a downloadable template from its website for a strategic communication plan that was created to help organize ideas, outline objectives,

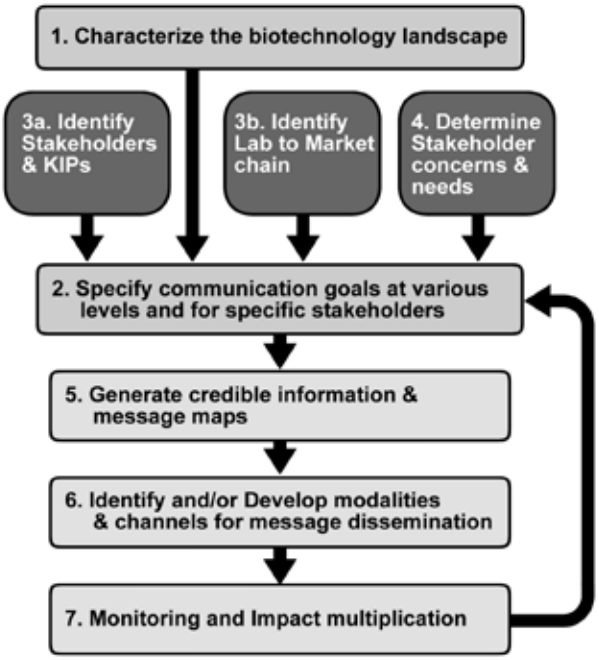
Table 4. Sample Questions in Developing a Communication Plan.

ELEMENT	SAMPLE QUESTIONS
1. Determine Goal	What issue is most important to your organization now? Who is most affected by the issue? Who makes decisions about the issue? What is the overall goal you want to achieve? What tangible outcomes would you like to achieve through a communication effort?
2. Identify and Profile Audience	Of your identified audiences, whose knowledge, attitudes and behavior must be changed in order to meet your goal? (primary audience) Who else is affected if you succeed in your goal? (secondary audience) What are the characteristics of this audience?
3. Develop Messages	What change in attitude (or how one feels about an issue) do you want to motivate in your audience to meet your goal? What change in the behavior (day-to-day actions do you want to achieve? What are the three most compeling sentences you could use to motivate your audience?
4. Select	Where or from whom does this audience get its information? Who do they find credible? Where does this audience spend most of its time?Where are they most likely to give you their attention?
5. Choose Activities and Materials	What are the activities, events and or materials to be used in your selected channels that will most effectively carry your message to the intended audiences?
6. Establish Partnerships	Who can support or work with your audiences or share in your goals? What role will they play?
7. Implement the Plan	What are the activities to be done and the steps that will lead to its completion? What is the time table to accomplish the activities? What is the budgetary estimate for each activity?
8. Evaluate and Make Mid-Course Corrections	What are the strengths and weaknesses of the plan? What are the obstacles? What new approaches can be implemented for success?

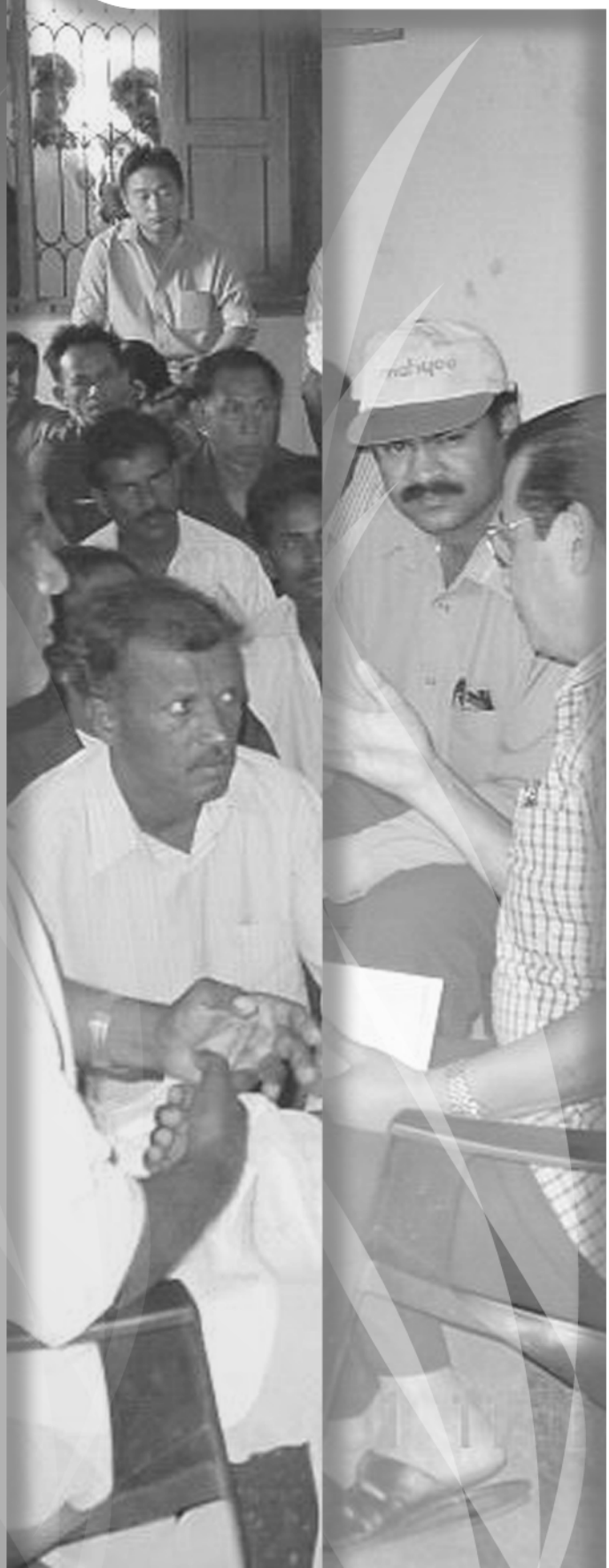
Source: W. K. Kellogg Foundation's Communication ToolKit
http://www.wkkf.org/Default.aspx?tabid=90&CID=385&ItemID=5000034&NID=5010034&LanguageID=0.
Permission to use information granted by W.K. Kellogg Foundation on May 8, 2008.

and create strong and strategic messages. It recommends questions for each element of a strategic communication plan. Sample questions that need to be answered are presented in Table 4.

From a similar perspective, Teng (2001; personal communication, July 18, 2008) reiterates the important steps in a biotechnology communication model. The process shows the flow of required actions to assure the success of communication endeavors: characterize the biotechnology landscape, specify communication goals, identify stakeholders and key influence persons (KIPs) and their concerns, generate credible information, identify modalities for message dissemination, and monitor impact. Information from monitoring activities will validate communication goals and thus allow for modifications if necessary.



VII Identifying Key Messages



A strategic communication plan done in collaboration with key stakeholders is an important step in building public support. Equally important is identifying key messages. Closely tied to goals and objectives, messages give important information about issues and encourage specific audiences to respond accordingly. Messages show the importance or relevance of an issue, and connect values and beliefs of specific audiences.

The International Food Information Council has 10 communication tenets for consumer acceptance of food biotechnology. They are suggested for any opinion leader charged with communicating food biotechnology issues to the public. Examples of these tenets are (Benson, 2007):

- The purpose for each new product of food biotechnology and its consumer benefits must be explained clearly at the beginning of public discussion;
- Biotechnology must be placed in context with the evolution of agricultural practices;
- Communications should emphasize the exhaustive research over many years that led to the introduction of each new product of food biotechnology; and
- Government and industry communications on food biotechnology must be consistent in order to earn consumer confidence.

Andy Benson (personal communication, June 16, 2008) said that the overall goal of the communications tenets is to help and encourage key, credible stakeholders, experts and officials to work together to provide the food chain and the consumer with a balanced view of biotechnology that is solidly grounded in the current science and in the known facts regarding its development. This way, one builds a broad body of knowledge, and a broad platform for its dissemination to people who need to know and to people who want to know.

Seminars and workshops organized by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) identified

"burning issues" in biotechnology that need to be addressed (Navarro et al., 2006). These are:

- How can agri-biotechnology help attain global food security and alleviate poverty?
- What are the social and economic benefits of agri-biotechnology?
- What are the regulations in assuring public safety on genetically modified crops?
- Are genetically engineered foods safe, cheaper and more nutritious?

The media dialogues thus revolved around three major issues:

- Establishing suitable regulatory mechanisms to control the global trade of agri-biotechnology products;
- Ensuring that the potential risks to human health and the environment derived from using agri-biotechnology products are duly assessed and managed; and
- Increasing public awareness and acceptance of agri-biotechnology products.

The Biotechnology Information Center (BIC) in the Philippines has recommended basic messages for the media, opinion leaders, government and the public. These include:

- The safety of foods developed through biotechnology is assured through rigorous testing that meets rigorous international standards.
- Biotechnology can help make farmers be more competitive in the world agricultural market, and as a result will help the Philippines to be less dependent upon foreign imports.
- Biotechnology will be one additional tool that Filipino farmers can choose to make it easier for them to grow healthy crops with good yields.

A useful tool to help prioritize messages is the use of a message map. Dr. Vincent Covello of the Center for Risk Communication (2005 and 2007), defines it as a tool for organizing information in a transparent manner, thereby promoting open dialogue. It is a roadmap for displaying detailed, hierarchically organized responses to anticipated questions or concerns. Effective messaging involves the following steps:

- Identify stakeholders – interested or affected parties – for a selected issue of high concern.
- Identify a complete list of stakeholder questions and concerns. This list can be generated through research, including media content analysis, reviews of historical documents, interviews with issue experts, focus groups, and surveys.
- Analyze the questions to identify common sets of underlying concerns from the perspective of the intended receiver.
- Develop three key messages in response to the generated list of stakeholder concerns and specific questions. These messages must be brief, clear, and positive.
- Develop supporting facts and proofs for each key message. Proof points can be third party validation, use of statistics, and quoting a scientific study.

Using these steps, ISAAA's *Afri*Center developed message maps to present facts and figures on a particular subject in a format that facilitates quick reading and comprehension. These message maps (Figures 3 and 4) target parliamentarians and high level policy-makers with the aim of contributing to a better understanding of the various concerns related to biotechnology and biosafety in Kenya. The maps were distributed to all sitting members of Parliament to equip and prepare them to adequately discuss the Biosafety Bill from an informed perspective (Africa: Program Activity Review, 2007).

Once key messages are clear and concise, it is now possible to decide on communication approaches and strategies to use.

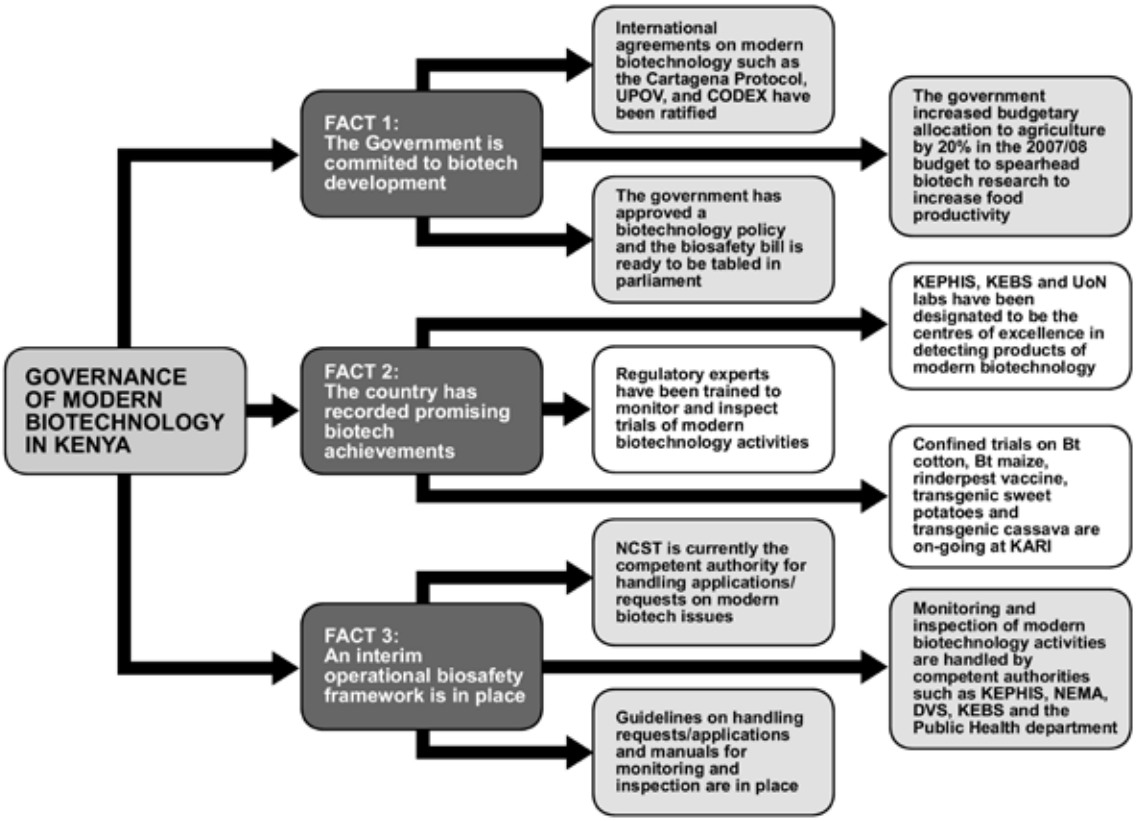


Figure 3. *Message map on governance of modern biotechnology in Kenya.*
Acronyms: UPOV- The International Union for the Protection of New Varieties of Plants; NCST- National Council for Science and Technology;KEPHIS- Kenya Plant Health Inspectorate Service, KEBS – Kenya Bureau of Standards, UoN- University of Nairobi, NEMA- National Environment Management Authority ;KARI – Kenya Agricultural Research Institute, DVS – Directorate of Veterinary Services

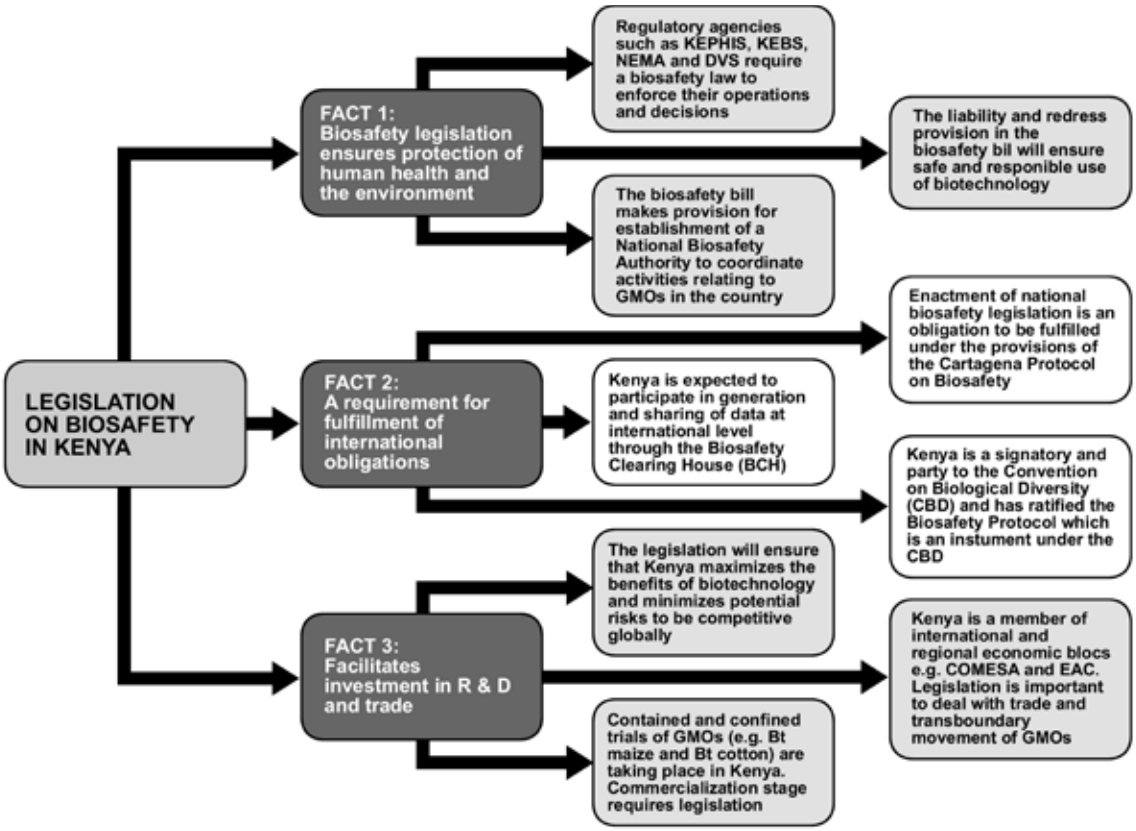


Figure 4. *Message map on biosafety legislation in Kenya.*
Acronyms: COMESA - Common Market for Eastern and Southern Africa; EAC – East African Community