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Vietnam

Paving the Way for Greater Awareness and Understanding of Biotechnology

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Over the last 20 years, Vietnam has been one of the fastest growing economies in Asia. The World Bank (2009) considers its achievements in reducing poverty and attaining positive economic growth as one of the "most spectacular success stories in economic development." Annual growth of real gross domestic products (GDP) averaged at 7.1% between 1990-2009 and is on its way to attaining middle income country status by 2010.

Ironically, Vietnam suffered three decades of economic slowdown and isolation due to war with France and the U.S. and border conflicts with China and Cambodia. Its economy was further weakened by its collectivist economic policies after reunification. However, the government introduced a new

COUNTRY PROFILE

VIETNAM

The Socialist Republic of Vietnam is bordered by China on the north, Laos on the northwest, Cambodia on the southwest and the South China Sea on the east. It has a relatively complicated terrain with numerous mountains, rivers, and a long and meandering coastline. Mountains account for 40% of the area, with densely populated fertile plains in the north and south around the Red River and Mekong deltas, respectively. Agricultural land accounts for 28% of total area with plains occupying 25% (Bingxin Yu et al., 2010).

The country has a population of 86 million with about 73% working in rural areas. It has the highest number of farmers per farming land among Southeast Asian countries with about 927 farmers per km^2. Agriculture sector accounts for 22% of GDP, with rice and coffee as major agricultural exports. Vietnam is now the number one exporter of cashew and the second largest rice exporter in the world. It also exports coffee (robusta), pepper (spice), tea, and rubber. Its economy is based largely on agriculture-related industries (General Statistics Office of Vietnam, 2010).

Vietnam is a one-party state in which the Communist Party of Vietnam (CPV) provides guidance to the government on major policy issues. No legal opposition to the regime is permitted and, hence, widespread public opposition is uncommon. The government's main legislative body is the National Assembly whose 500 members are elected every five years. While it remains under the control of the CPV, it is increasingly able to provide legislative and governmental oversight.

economic program called *doi moi* (renovation) in 1986 which introduced liberal market principles and gradually moved from a centrally planned model to a market economy. Market-oriented reforms included full or partial privatization of state-owned enterprises, liberalization of markets, and recognition of private property rights resulting in the emergence of a vibrant and young private sector (Asian Development Bank, 2009).

The government has placed a high priority on agricultural and rural development. In Vietnam's *Strategy for Socio-Economic Development for the Period 2001-2010*, improvements in agricultural research and extension were identified to be the driving forces behind poverty reduction, economic growth, and national development (MARD-FAO, 2001). In 2010, Vietnam

was set to phase out small-scale agriculture through the introduction of new high end technologies that link closely with biological technology. By industrializing agriculture, Vietnam has targeted an annual growth rate of more than 3.5 percent until 2020 to ensure national food security (MARD, 2010).

Science and Technology Development in Agriculture

The Vietnam government attaches great importance to scientific and technological development. A national agency for Science and Technology (S&T) was already set up as early as the 1950s. Even during the American War in 1960-1970, a large number of scientists and engineers were educated in Vietnam and in countries abroad and several research and development institutes were created by the government. Immediately after the country unification in 1975, the country built S&T institutions inspired by the Soviet Union's self-contained and self-sufficient economic development model. The *doi moi* policy resulted in dynamic changes such as the creation of more research centers, flow of funds for research from industry and other sources, and decentralization of government control over these centers. Three groups are involved in S&T: (1) general scientific and engineering institutions directly under government administration and control; (2) science and engineering organizations which are relatively autonomous but funded mainly by the government; and (3) higher education institutions (Krishna and Krishna, n.d.).

The significant increase in research-based agricultural productivity is considered as one of the greatest achievements that economically transformed the country. The government's breeding program contributed greatly to increasing the productivity and quality of agricultural products. However, agriculture growth is not sustainable with rising population, overexploitation of natural resources, decreasing agricultural land, and environmental concerns such as climate change. Hence, the country continues to explore new agricultural technologies to maximize and boost productivity. The Ministry of Agriculture and Rural Development (MARD) which manages research activities in agriculture has set development strategies up to 2020 to assure a comprehensive, modern, and sustainable

agricultural sector. In addition to ensuring national food security, the agricultural sector will, likewise, develop commodity crops which have high competitiveness and high efficiency for domestic and export market (MARD, 2009).

Agricultural Biotechnology Research and Development

Biotechnology was identified as early as the mid 1990s as a critical tool to increase domestic needs, meet new export market demands, and conserve natural resources by developing improved and more sustainable agricultural systems. A National Council on Biotechnology was established under the chairmanship of the head of the Department of Fundamental Sciences of the State Committee for Sciences in 1991. A national program was established in recognition of the need for genetic engineering, plant cell technology, and DNA recombination techniques as prerequisite technologies for agricultural productivity (Nguyen, 2000).

Several government decrees and circulars issued by ministries specified the implementation of laws and ordinances pertaining to the development and application of modern biotechnology. Many legal documents are available but a few remarkable documents are forwarded. The Secretariat of the Communist Party of Vietnam issued Resolution 18/CP in March 1994 clearly stating the government's standpoints on biotechnology until 2010. It indicated support for research, establishment of a technological foundation for production of various products for domestic consumption and export, and setting up of an appropriate structure of S&T institutions that would be involved in biotechnology. Four main research areas were identified for agricultural biotechnology applications (Ngo Luc Cuong, 2003):

1. micropropagation technology for economically important plants;
2. breeding to create high yielding, insect and disease resistant crops focusing on rice, vegetables, and root crops;
3. production of plant growth regulators and active compounds for livestock production and health protection; and
4. post-harvest and food processing research.

The Political Report of the VIII Party Congress in 1996 noted the need to develop biotechnology to create and breed new varieties and that high technology zones in Hanoi and Ho Chi Minh City would be established as the hub for high technology-based industries (MNRE, 2004).

Direction No. 50 on March 3, 2005 again recognized the importance of modern biotechnology. It noted that "biotechnology has become a very important science in many countries in the world" and defines the role of modern biotechnology in the development of Vietnam as "an important factor contributing to ensure food security, structural change and sustainable development of agriculture and rural development; and provide basic and essential products for the public health care and environmental protection." Decision No. 212 on August 26, 2005 promulgated the regulation on the management of biological safety of genetically modified organisms (GMOs) as well as products and goods originating from GMOs.

Biotechnology is considered among the priority technologies in the S&T Strategy until 2010 along with information technology, new materials technology, and mechanical engineering and environmental technologies. In addition, biotechnology is among the high technology priorities in the Government Action Plan 2005-2010 (Nguyen, 2005). The approval of large-scale investments in biotechnology research by the government in February 2006 underlines its commitment to increasing efforts in this field (Stads and Nguyen Viet Hai, 2006).

Decree 11/2006/ND-TTg for Key Programs and Application of Biotechnology in Agriculture to 2020 was signed by the prime minister in January 2006 forwarding a plan to create new plant varieties, animal breeds, and biotech products to enhance the competitiveness of Vietnam's agricultural sector. Under this plan, MARD is the lead agency tasked to develop a variety of biotech seeds, including cotton, corn, and soybeans which would be commercially available by 2010, with biotech crop varieties accounting for about 70% of total crop production by 2020 (USDA GAIN Report, 2009). An Inter-ministerial Circular No. 11 dated July 27, 2007 from the Ministry of Public Security and Ministry of Environmental Science approved a decision to invite foreign experts or send Vietnamese scientists abroad to do research. The Parliament approved the Biodiversity Law in 2008. In October

2009, MARD issued Circular No. 69 to evaluate risks to biodiversity and the environment of GM plant varieties. A month after, Circular No. 72 approved a list of GM crops allowed to undergo risk assessment of biological diversity and the environment with intent for plant breeding. Three major crops, namely corn, cotton, and soybean were in the list. In June 2010, Decree No. 61 provided investment policies for business in agriculture and rural areas. Biotechnology was included in the list to receive special investment privileges and would enjoy preferential tax and land incentives. That same month, Decree No. 69 was released pertaining to the approval of biosafety guidelines for GM crops and its products. This sets the legal framework for research and trade of GMOs and GM products in the country.

Several organizations are involved in agricultural research and developing new crop varieties in Vietnam. These include among others the following (Ngoc Ca, 2009; Nguyen Thanh Thuy, personal communication):

- Agricultural Genetics Institute
- Cuu Long Delta Rice Research Institute
- Food Crops Research Institute
- National Maize Research Institute
- Institute of Biotechnology
- Institute of Agricultural Science for South Vietnam
- Fruit and Vegetable Research Institute
- Southern Fruit Research Institute
- Vietnam Academy of Agricultural Sciences

In the forefront of research are the Institute of Biotechnology at the Vietnam Academy of Science and Technology, Agricultural Genetics Institute at MARD, Cuu Long Delta Rice Research Institute, and Institute of Tropical Biology. Little research is being implemented in universities. Capacity building of the scientific pool is being strengthened through Decision No. 3279 of the MARD allowing international cooperation in scientific research on biotechnology, or importation of foreign technology.

Biotech research is being done on rice, sweet potato, papaya, cotton, maize, and flowers. Proposals are also being submitted to allow field testing of soybeans, maize, and cotton in preparation for field trials. Vietnam was part of the Papaya Biotechnology Network of Southeast Asia, a project of the

Stakeholders view Bt corn trial in Ha Tinh.

International Service for the Acquisition of Agri-biotech Applications (ISAAA) established in 1998 and supported locally by the Institute of Biotechnology under the Vietnam Academy of Science and Technology (McLean, 2003). Currently, Vietnam has approved three GM crops (maize, soybean, and cotton) with the aim of testing and evaluating risks to biodiversity and the environment (Circular No. 72/2009/TT BPTNT, November 17, 2009, MARD).

In March 2010, MARD granted permits for Monsanto and Syngenta to conduct risk assessment for biodiversity and the environment of GM maize in confined field trials. Limited field trials for biotech maize varieties of these seed companies were started in May 2010 at the Experimental Center of the Agricultural Genetics Institute, Van Giang District, Hung Yen Province, about 50 kilometers from Hanoi (Nguyen Hong Chinh and Pham Duc Tuan, personal communication). The Parliament approved the Food Safety Law which will take effect in July 2011. Food and feed safety concens will be the responsibility of MARD instead of the Ministry of Health as stipulated in an earlier circular. MARD is set to prepare the specific implementing guidelines for the Biosafety and Food Safety Laws.

Public Perception of Biotechnology

A study of public understanding, perception, and attitude towards agricultural biotechnology among Vietnamese stakeholders revealed that they generally show a moderate to high degree of interest (Juanillo, 2003). Respondents were represented by scientists, policy makers, journalists, farmer leaders,

extension workers, businessmen, and consumers. Scientists (those not part of the crop biotechnology research consortium) expressed very high interest followed by journalists and policy makers. Despite their interest in biotechnology, the high benefits they associate it with, and their belief in the pivotal role that science plays in Vietnam's agriculture, stakeholders gauged their understanding of science to be marginally moderate. With the exception of scientists, most stakeholders rated their understanding and knowledge of biotechnology as below and slightly moderate. This is validated by the low scores they obtained in a pop-quiz on agri-biotech.

The survey revealed that stakeholders held a very moderate stance on biotechnology which can be interpreted as guarded optimism. The levels of concern and attitude are indicative of the questions that stakeholders may have about biotechnology. Generally, university scientists, research institutes, and mass media are regarded as the institutions much concerned about public health and safety issues relating to agricultural biotechnology. Information seeking among the stakeholders was still quite low with scientists, journalists, and policy makers being more active seekers than extension workers, farmers, businessmen, and consumers. Mass media such as radio, television, and newspapers was the most frequently used source of information. This was followed by books and publications, family and friends, and experts and professionals.

Policy making discourses appeared to be one of caution or a wait-and-see attitude. This could be due to lack of relevant information that would enable people to be more definite with regards to their thinking and attitude towards biotechnology.

Print Media Coverage of Agri-biotech

Newspaper coverage of agri-biotechnology in Vietnam from January 2002 to June 2003 (Le Thu Hien and Navarro, 2004) showed that media practitioners do write about the topic. A total of 246 articles, 168 in 2002 and 78 during the first six months of 2003, were written in 14 publications. These publications were the English newspapers *Vietnam News*, *Saigon Times Daily*, and *Vietnam Investment Review*; Vietnamese newspapers *Nhan Dan* or

People's Newspaper, *Labor (Lao Dong)*, the *Laborer, Science and Technology Journal* (with short English translations), and *Vietnam Economic Times*. The other publications with Vietnamese and English sections include *Vietnam Biotechnology, Journal News, VNEconomy, Vnexpress, Youth Newspaper* and *Vitranet*. On the average, a total of 14 articles were published monthly in 2002 and 6-7 articles a month in 2003. *Vietnam News, Saigon Times Daily* and *Nhan Dan* published the most articles, accounting for 77% of all articles in 2002 and 53% in 2003.

Biotech articles mostly appeared in special pages that carry reports on such topics as the environment, science and technology, agriculture, and rural section. The public sector such as MARD and the Office of the President and that of the Prime Minister were cited as sources of information. Biotechnology as a topic was basically generic in tone or at a general awareness level of coverage. It was discussed as a relatively new term that focused on its relationship to concepts like agriculture, environment, and industrial efforts to modernize Vietnam and make it a significant leader in Asia. The economic context was the most used theme accounting for 70% of all articles, stressing on the production and marketing potentials of crop biotechnology. Generally, articles had a positive tone, supportive of government initiatives, and highlighted the impact of biotech in the context of economic development.

Science Communication Initiatives

Decision No. 11/2006 of the prime minister states the need to promote information sharing and education to raise awareness of all sectors on the important role of biotechnology to the "development of human society in general and to the development of agriculture in particular; frequently providing people with the information on biotechnology innovations, the application of biotechnology in agriculture in mass media." Government media organizations have a political mission to disseminate science and technology (S&T) information to the public. The Ministry of Agriculture, and the Ministry of Science and Technology and its research institutes, as well as academic institutions have their respective information arms but none are dedicated solely for biotechnology.

Mass media in Vietnam is owned by the government. Central media organizations such as Vietnam Television, Radio Voice of Vietnam, and Vietnam News Agency are equivalent to government ministries. Journalists from central media outlets have greater authority than those at the provincial level since they are administratively independent government organizations. Central media reaches out to nationwide audiences and are sources of information by leaders. Hence, it can have an immediate impact on public opinion (Banerjee and Logan, 2008). Media is expected by the ruling Communist Party to disseminate party doctrines to educate the populace. In recent years, media has benefited from a considerable expansion of autonomy. In addition, there is a growing acceptance by government in considering media as an ally for advancing its goals (World Bank, 2009). There are more than 350 newspapers, magazines, and journals in the country and internet use is growing steadily with 20% having access to it. The Vietnam News Agency (VNA) is the official government wire service which disseminates and receives both local and international news. The primary national newspaper *Nhan Dan* (People's Daily) has a circulation of half a million and is a required reading by government and party workers. It features transcripts of party speeches and articles written by party leaders that discuss the government and economic and cultural developments (Press reference.com, n.d.).

Media plays an important role in educating the public on science in general. VTV2 has regular education and science program segments which are aired at regular interval of 15-minutes. Radio and television interviews with scientists as well as articles in newspapers on government pronouncements, activities, and news from other countries get media coverage. News about S&T are aired by Radio Voice of Vietnam (VOV) since scientific breakthroughs are considered a driving force for economic development and a means to help Vietnam develop and integrate with the global economy. The broadcasting time and duration for S&T is equal to that of other programs devoted to political, economic, and social concerns.

VOV is the national broadcasting media station of the Vietnamese Party. Radio is still the most preferred channel compared with television and print media. VOV is estimated to reach more than 90% of all households, with 70% of the population still residing in the countryside.

Ministry of Agriculture and Rural Development

Capacity building and outreach activities are being done by MARD. It collaborates with other local agencies and international groups to support a variety of workshops and activities to increase the knowledge base of scientists, farmers, media, and other stakeholders. In time with current field trials on GM maize, the Agricultural Genetics Institute held a conference and field visit on August 25, 2010 at its experimental center in Van Giang District, Hung Yen Province to orient various stakeholders on the project focusing on prospects and challenges. The participants included representatives from various ministries (Agriculture, Natural Resources and Environment, Health as well as the Vietnam Academy of Agricultural Sciences), provincial departments and district People's Committee, R&D institutions, tri-media, and private partners. This activity enabled a wider community to understand the rationale for the field trial, activities being implemented, and the prospects ahead. The event was featured in VTV2 and in newspapers (Nguyen Thanh Thuy, personal communication).

Ag Biotech Vietnam

An organization involved in information sharing is Ag Biotech Vietnam, one of 24 Biotechnology Information Centers (BIC) of the International Service for the Acquisition of Agri-biotech Applications (ISAAA). Hosted by the Hanoi-based Science and Technology Information Service, it was established in 2001 to be a source of science-based information on crop biotech developments. Prior to its stint as part of the global information network, it provided news on business, law, and general science information. Ag Biotech Vietnam uses a variety of communication strategies, both interpersonal and media channels, to share information and experiences.

It has a website (http://www.agbiotech.com.vn) with sections on local and global news, biofuels, achievements, technology, policy and regulation, frequently asked questions and answers, and announcements. It sends weekly e-mails to a subscribers' list to update them on global and local news related to crop biotechnology.

The BIC coordinates with the press such as those from *Today Countryside* and local universities such as Hanoi Agricultural University to hold writing contests on biotechnology among students and the public. Students are asked to write essays on the questions: What do you know about agri-biotechnology? What is the relevance of the technology to the country's future? They are encouraged to research on the topic and read relevant publications published by the BIC to assure accuracy of their articles. Prior to the actual contest, a column in *Today's Countryside* tackles concepts and issues about biotechnology, thus, providing background information that can be used as reference for the articles. During the last contest, over 3,000 students nationwide submitted articles.

Writing contest on biotechnology attracts over 3,000 contestants.

Ag Biotech Vietnam also holds seminars in Hanoi and other provinces for policy makers, media, agricultural workers, farmers, and information officers. A workshop on the development of biotechnology in Vietnam introduced participants to the advances and risks and benefits of modern technology. Biotech fora for students and media workshops for journalists are also conducted to provide updates on crop biotech developments. Feedback of these seminars has been positive with respondents noting an improvement in knowledge and awareness of modern biotechnology.

Ag Biotech collaborates with radio stations of VOV to broadcast information about biotechnology and its applications. It has endeavored to be a reliable and neutral source for stakeholders particularly farmers. Topics on regular programs include GM crop and the environment with emphasis on pesticide reduction; GM crops such as flood resistant rice and salt tolerant rice; biosafety regulation; and legal framework on GM crops in Vietnam. A biotech

forum is also done with a live question-and-answer session about the global status of commercialized GM/biotech crops and their applications in Vietnam. Stories in these programs are based on materials prepared jointly by the BIC and VOV broadcasters from ISAAA publications and internet sources.

Books are also being published in Vietnamese. These include one on the legal status and regulations of developing agricultural biotechnology in Vietnam targeted for the scientific community, policy makers, extension workers, media, and other interest groups. The book contains general information about biotechnology, its legal documents and regulation as well as agri-biotechnology developments in the country. Another book is on the internet and deals on how to use its resources to seek biotechnology information. A book on biotech crops in world agriculture and in Vietnam has just been published. It gives an overview of the role of plant biotechnology and Vietnam's policy on its application for the development of agriculture. Translations of various publications and videos on biotechnology are done to make them easily available for different stakeholders.

A significant task of the BIC is to translate documents, news, and videos from English to Vietnamese so that the materials have a greater stakeholder reach. These include important publications like the Global Status Report of Commercialized GM/Biotech Crops, Pocket K series on crop biotechnology and related topics, *Crop Biotech Update* news, and videos on GM crops.

Communication Challenges

1. Stakeholders' understanding of biotechnology

Unlike most other Asian countries, Vietnam has no opposing political groups and active anti-biotech campaigns being waged by NGOs or civil society groups. Considered more of a challenge is the lack of understanding about the technology among key stakeholders. Extension workers and local leaders need to participate in the awareness seminars that are being held. They are the bridge between farmers and government, being responsible for introducing varieties and briefing farmers on technology.

Aside from seminars, "seeing-is-believing" tours and exchange visits to countries where farmers are already planting GM crops are suggested. Farmers' exposure to field trial sites and actual farmers' fields where they can see the benefits of a biotech crop versus a conventional variety is a powerful way for farmers to form opinions about it. To a farmer, product or crop performance is enough basis for making decisions about adopting a technology. Farmers also prefer to share experiences with peers on such issues as pest management and appropriate cultural practices that assure productivity (Nguyen Thanh Thuy, personal communication). Currently, field trials are being done and farmers involved in the project and those near the site can benefit from briefings on the activities being carried out so as to provide them with correct information that they can relay to their colleagues (Nguyen Hong Chinh and Pham Duc Tuan, personal communication).

The role of local officials in the biotech debate is also crucial. The nucleus of many of Vietnam's public policy debates is the National Assembly. With locally elected People's Councils, they have gained certain powers of oversight and have generally become more assertive. Provincial People's Councils have gained new powers over public finance, public investment, and land use management, among others. Although active participation and engagement of citizens are difficult to implement, ensuring the opportunity for these to happen is essential (World Bank, 2009). The government has a system of state officials who promote agriculture in the village and provide technical guidance to farmers. However, local leaders make decisions that directly affect them. Farming communities determine what to plant and adoption of new technology is within their decision-making capability. Hence, integrating the local leaders and farmers in the science communication process is an important task that needs immediate action.

2. Conflicting information

Ministries are responsible for disseminating official statements to the media. Each ministry issues press releases and related publications on its activities. However, it is possible that conflicting information is given due to each ministry's understanding and interpretation of issues. Instead of openly refuting the article or sending a rebuttal to the newspaper, a ministry may opt to provide another article about the topic. On top of this is that ministries

have their own institutional newsletters and information based on their own perspective. Scientists also find themselves in a situation where they explicitly disagree among themselves and the media picks up divergent opinions. Hence, media practitioners are also unable to determine which is accurate information and readers are confused by conflicting information. Thus, a crucial need is to harmonize and orchestrate information efforts among the ministries (Trieu Van Hung and Nguyen Van Toan, personal communication).

3. Availability of and access to information

Translation of key documents and publications is an important task in Vietnam where English is not as widely spoken. Similarly, many government publications are in Vietnamese and need to be translated into English so that the rest of the world is informed about updates in the country. However, translators with a science background are not easy to find and more often than not, summaries rather than whole documents are made. This is a problem as many science-based publications are readily available but are not read due to language issues.

Media practitioners rely on these translated documents as sources for articles and radio broadcasts. However, more than just translated materials is the writer's pragmatic approach to the topic. Media popularizes a lot of these materials so that their audience without scientific know-how can understand the topic. It is a great deal of work on the part of journalists and radio broadcasters to digest and popularize a lot of materials they get from government and private sources. It is not enough to explain concepts, more important is how to make these relevant to day-to-day living of readers or listeners. Effort is exerted to transform science news into an easy to understand format, one that involves explaining terminologies or scientific jargon and making it an attractive story at the same time. A writer or broadcaster is often constrained by his knowledge and understanding of issues, and cannot depend much on a given copy. In addition, the material has to be transformed into a more vibrant and engaging write-up or script to generate attention and interest. Materials have to be regular and consistent as news is published or read on set days and time. Feedback is immediate in radio and farmers' inquiries show that there is a a positive interest in biotechnology (Le Thu Hien, 2009; Hoang Minh Nhat, personal communication).

On the other hand, media practitioners tend to reprint sensational articles which have no scientific basis for allegations made. A case in point was an article from Russia printed verbatim in a national newspaper that discussed the negative effects of GM foods. A well-informed media is crucial to generate accurate information and provide a venue for discussion of the technology's benefits (Trieu Van Hung and Nguyen Van Toan, personal communication).

Science writers are few in Vietnam. Science is perceived to be a difficult topic for discussion and is "less interesting" than politics or crime. Biotechnology as a field of interest is difficult to write about and information available is sometimes difficult to understand. Media practitioners particularly senior writers, however, have an edge in dealing with scientists who are willing to be interviewed about the details of their work. There is an apparent need however, for opportunities for them to better understand the technology through exchange visits to countries commercializing biotech crops (Tran Le, personal communication). In addition, ensuring that media has science-based information from credible sources in a form that is easily understood can help improve the professionalism of communication practitioners and encourage accurate reporting.

Although the internet is a more economical means to disseminate information to a greater number, Vietnamese stakeholders still prefer a printed newsletter or publication. Since there are many villages in over 500 districts, this translates into higher production and distribution costs (Le Tien, personal communication). However, the internet is increasingly becoming an acceptable form of information source for both local and global developments as well as giving citizens an alternative channel to share experiences. It can contribute to shaping the way people see the world and in the process allow fact-driven decision-making. The internet in the country is still plagued by inadequate service providers and unavailability of internet facilities. Nevertheless, no less than the Minister of Agriculture and Rural Development Cao Duc Phat has shown appreciation for the efforts of Ag Biotech Vietnam to use the internet in "sharing information, disseminating and raising knowledge for our people in the field of agricultural biotechnology" (Ag Biotech Vietnam, 2010). It is also important to note that stakeholders, including scientists, need to be informed about the information sources available in biotechnology.

4. Lack of science communicators

Science communication is not yet a formal field of interest in Vietnam, hence, there is inadequacy of professionals committed to its development. The main issue aggravating this problem is the lack of people capable of comprehending biotechnology and finding it interesting enough to communicate. Opportunities need to be set up to induce efforts by both scientists and communicators so they are able to learn from each other and build on their individual strengths.

Aside from scientists and communication practitioners, farmer associations also need to take an active role in public awareness activities. The private sector advocating biotech adoption is not favorably perceived by the public, hence, their decision to concentrate more on field trials or the research aspects of their involvement (Nguyen Hong Chinh and Pham Duc Tuan, personal communication). Building up a critical mass of science communicators can lead to the empowerment of Vietnam's citizenry on biotechnology.

Way Forward

The conditions are favorable for biotechnology knowledge sharing initiatives in Vietnam since there are no organized anti-GM groups, and that the government and scientific sectors are supportive and committed to the technology. While government agencies and private groups are collaborating on public awareness programs, there is a felt need for more dynamic activities. Nevertheless, the country needs more communication campaigns for its stakeholders so that accurate information can empower people to engage in science-based discussions and eventually lead to acceptance and adoption of the technology.

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3. Dr. Nguyen Thanh Thuy, Deputy Director, Agricultural Genetics Institute
4. Mr. Pham Duc Tuan, Regulatory Affairs Manager, Syngenta
5. Mr. Nguyen Hong Chinh, Regulatory Affairs Lead, Monsanto
6. Mr. Tran Le, Journalist, *Vietnam Economics Times*
7. Ms. Hoang Minh Nhat, Broadcaster, Radio Voice of Vietnam