

GOVERNMENT OFFICERS AND THE PUBLIC AWARENESS OF SCIENCE IN THAILAND: A CASE STUDY ON BIOTECHNOLOGY

Aphiya Hathayatham¹

¹National Science Museum, Thailand

Abstract

This study was conducted in 2002-2004 among government officers who work closely with the general public in the areas of agricultural biotechnology and medical biotechnology, particularly in regional areas of Thailand. The results indicate that even though the majority of the government officers in this study acknowledge that public awareness of biotechnology is very important, their knowledge of biotechnology is slight. They have commented on the problem of not having enough information themselves to be of assistance to the public. Problems about lack of networks between the government organizations, which lead to problems of availability and accessibility to the sources of information, and the lacking of professional training, were also raised. This study has indicated that the first priority in the mission of raising the public awareness of science is to improve the competencies of the government officers in their awareness of important science issues. It has underlined an urgent need of a more proactive approach to bridge the gap between scientists and other government officers to help in raising science awareness and competencies among the government officers in order that they can consecutively and successfully complete their mission in raising the public awareness of science and technology.

Keywords: Public awareness of science, science communication, government officers, scientists, biotechnology, sources of information, perception.

1. Introduction

Comparing the importance of producing more scientists, which has been considered as a very important factor for the development of the country, and the importance of improving science communication in the country so that people can be more aware of how science and technology could affect their lives, neither can 'win'. Without the first one (people who have proper knowledge and have the ability to produce new knowledge), the second one (science communication –giving correct and understandable information) can hardly be improved. Likewise, without the second one (good science communication), there is no point in producing knowledge if the people do not know how to use the knowledge properly. Accordingly, science communicators becomes very important tools in building bridges between the general public and science in order to make the most use of the science without causing any tragic stories affecting people, or the environment. The huge investment in technology alone, without strong policy and consistency in improving science and technology awareness of the people, is a waste of energy and money.

One of the keys to the success in raising the public awareness of science is therefore a high competency of science communicators. Without those who act as a link between science and the public it is less likely that we will be able to raise the public awareness of science. Charlermchai Honark (2001), the first and founding President of the National Science Museum, Thailand (NSM), has the view that

".... The most important thing in making effective communication is to ensure that the sender or communicator knows well about his/her receivers (audiences), their needs and their expectations."
(p.2).

In the Ninth ASEAN Ministerial Meeting on Science and Technology held in Brunei Darussalem in September 2001, the Science and Technology Ministers from ten ASEAN Member Countries addressed the low level of awareness of science and technology in the region and called for intensified efforts to publicize the achievements of science and technology cooperation in the region. They also called for an outreach programme to raise the level of science and technology awareness of the media, government and business leaders, schools and the general public. (Association of South East Asian Nations, 2001).

To raise the public awareness of science, it is very important first to make sure that those who act as science communicators have enough information and knowledge to support their mission. If those who have a role to communicate science with the public do not have enough proficiency to do so, it is less likely that their mission in communicating science with the public will be successful. This study aims to learn from those who have a role to communicate science with the public about how much they themselves are aware of particular topics in science and technology and to what extent they are competent in communicating science with the public. Using biotechnology as a case study, the results from this study are expected to be used as a stepping stone for many other related studies and lead to a better understanding of the public as well as to a better public understanding of science and begin to reveal the proper setting of science communication models in Thai culture.

2. Methodology

This study is a part of a PhD research study at the National Centre for the Public Awareness of Science, at The Australian National University on the topic of Public Awareness of Science in Thailand: A Case Study on Biotechnology conducted from 2002 to 2004. This part of the study was classified as a preliminary study with government officers who work closely with the general public particularly in regional area. Three main groups of government officers, whose work requires knowledge about agricultural and medical biotechnology and whose responsibility is to disseminate such knowledge to the public, were selected as a target group. They were Agricultural Extension Workers (AEWs), Community Health Workers (CHWs), and Biotechnology scientists (BIOSTs).

One thousand two hundred questionnaires were distributed to the subjects in the AEW and CHW groups (600 copies for each group). There were 127 returned questionnaires from AEWs (21.17%) and 206 returned questionnaires (34.33%) from CHWs. In the BIOST group, twenty-seven were returned after 50 questionnaires were distributed which gave the highest return rate of 54% in this study.

3. Findings

3.1 The respondents

3.1.1 Educational qualifications of the respondents

About 80% of AEWs and 60% of CHWs in the sample have a bachelor's degree whereas most of the remainder have lower educational qualifications. Only a few have higher education. In contrast, more of those in BIOST group have higher educational qualification: about 40% of them have a Master's degree. For the remainder, the proportion of those who have a Bachelors degree and those who have a Ph.D. is 1:1.

3.1.2 Age

The majority of the AEWs (about 70%) were in their 40's and about 20% were in their 30's whereas those who were older than 50 and younger than 30 were in the minority. In contrast, the majority of the respondents from the CHWs (about 40%) were in their 30's, with slightly less than 30% in their 40's. Once again, a minority was in the over 50 group. The scientists' group was the youngest. About 90% were younger than 40 years old. The proportion of those who were in their 20's and 30's was about 1:1.

3.2 Importance of public awareness of biotechnology

The majority of the respondents in every group shared the opinion that it is important for the public to be aware of the advances and development of biotechnology and its applications. The ratio of respondents who thought it is 'important' to 'very important' is shown in Table 3.1.

Table 3.2.1 Opinions of the respondents in each group about the importance of public awareness of biotechnology

	Very important	Important	Not sure	Not so important	Absolutely not important	No answer
AEWs	42.52%	51.97%	3.94%	0.79%	0.00%	0.79%
CHWs	28.16 %	53.40%	9.22%	7.28%	0.49%	1.46%
BIOSTs	51.85%	48.15%	0.00%	0.00%	0.00%	0.00%

3.3 Most frequently asked topics

To the question about what topic about biotechnology the respondents in each group have been asked by the general public, the results are presented in Table 3.3.1

Table 3.3.1 Total percentages of respondents who have been asked about different applications of biotechnology

Group	Genetic Engineering (GMOs) %	GM foods %	Cloning %	Medical use (produce vaccine, medicine) %	Xeno-transplantation %
AEWs	63.8	47.2	33.0	-----	-----
CHWs	-----	-----	55.8	40.78	33.98
BIOSTs	81.5	85.2	85.2	77.78	70.37

3.4 Perception of different issues in biotechnology

To the question about the perception of different issues in biotechnology of the respondents themselves, the results indicate that the percentages of the respondents who approved the applications of biotechnology were higher than those who disapproved except in cloning where the majority of CHWs disapproved as shown in Table 3.4.1.

Table 3.4.1 Percentages of the respondents who approved and disapproved different applications of biotechnology

	GMOs		GM foods		Cloning		Medical uses		Organ transplantation	
	approve (%)	dis-approve (%)	approve (%)	dis-approve (%)	approve (%)	dis-approve (%)	approve (%)	dis-approve (%)	approve (%)	dis-approve (%)
AEWs	33.86	10.24	16.54	11.81	29.13	12.60	-----	-----	-----	-----
CHWs	-----	-----	-----	-----	16.99	31.56	49.03	2.43	23.3	21.63
BIOSTs	62.96	7.41	48.15	11.11	40.74	18.52	96.30	0.00	44.44	7.4

In addition, very high percentages of respondents in every group gave reason for not able to make a decision that they did not have enough information to support their decisions. The results are presented in Table 3.4.2

Table 3.4.2 Percentages of the respondents who claimed not to have enough information

Do not have enough information	GMOs (%)	GM foods (%)	Cloning (%)	Medical uses (%)	Organ transplantation (%)
AEWs	51.18	66.14	53.54	-----	-----
CHWs	-----	-----	40.78	43.20	48.54
BIOSTs	22.22	37.04	22.22	3.70	40.74

Well, if they haven't got the information, how would they like to receive it?

3.5 Sources of information

To a question about sources of information the respondents used in obtaining information about biotechnology, printed materials are the favorite source of information for all groups. They are followed in popularity by government organizations, newspapers, television and the Internet. (Table 3.5.1 and 3.5.2).

Table 3.5.1 Sources of information that the respondents usually use when they need a reference about biotechnology

Sources of information	AEWs (127)*	CHWs (206)*	BIOSTs (27)*	TOTAL (360)*
Printed materials (Text book, article, journal, brochure, newsletter, etc.)	38.6%	21.4%	66.7%	30.8%
Government organizations	42.5%	12.6%	0.0%	22.2%
Newspapers	16.5%	15.0%	11.1%	15.3%
Television programs	15.0%	15.0%	14.8%	15.0%
the Internet	1.6%	7.3%	77.8%	10.6%
Academics, experts	9.4%	4.9%	25.9%	8.1%
Public library	3.9%	6.8%	29.6%	7.5%
Radio programs	9.4%	1.9%	14.8%	5.6%
Universities	6.3%	1.0%	3.7%	3.1%
Seminars, meetings, trainings	5.5%	0.5%	0.0%	2.2%
Colleagues, farmers, patients	1.6%	1.9%	0.0%	1.7%

Note* Total number of respondents used in calculating the percentage in the table. Respondents were invited to check more than one source if they wished.

Table 3.5.2 The top five favorite sources of information in the AEW, CHW and BIOST groups

Order	AEWs	CHWs	BIOSTs
1	government organizations	printed materials	the internet
2	printed materials	newspaper/TV programs	printed material the
3	newspapers	government organizations	library academics,
4	television programs	the internet	experts
5	reference persons/radio	the library	television/radio

3.6 Availability and accessibility

There are two aspects to gaining information about any topic: availability and accessibility of sources. In this section, respondents were asked to consider how available sources were for them. The same trend of the responses was found in every group. Almost 90% of AEWs, and about 85% of CHWs, as well as about 75% of the BIOSTs claimed that there were not enough accessible sources of information available for them (Table 3.6.1). The majority of both AEWs and CHWs stated that it is not easy to access those sources of information whereas the majority of the BIOST scientists claimed that it is easy for them (Table 3.6.2). Many of the respondents from both AEW and CHW groups share the same thought that there is a lack of knowledge and information about biotechnology among the government officers themselves as well as in the public sphere.

Table 3.6.1 Availability of the sources of information about biotechnology presented in percentage
(The raw data are in parenthesis)

Choice	AEWs	CHWs	BIOSTs
a. yes	3.94%	3.40%	18.52%
b. no	88.98%	84.47%	74.07%
c. no idea	6.30%	11.65%	7.41%
No answer	0.79%	0.49%	0.00%

Table 3.6.2 Answers about the accessibility to the sources of information in different groups of respondents

Choice	AEWs	CHWs	BIOSTs
a. yes	11.81%	1.46%	85.19%
b. no	84.25%	89.32%	11.11%
c. no idea	1.57%	7.77%	3.70%
No answer	2.36%	1.46%	0.00%

This result reflects different environments in the workplace. Those who work in the rural areas have to serve a larger group of the public but have more difficulty in accessing to the sources of information that they need for their work.

3.7 Public satisfactions

In order to evaluate the feedback from the public regarding the information they obtained from the government officers, the respondents were asked to evaluate whether the public was satisfied with the answers they provided. The majority of the respondents in every group reported that they were not sure whether the public is satisfied with their answers. (Table 3.7.1)

Table 3.7.1 The assessment of the respondents about the degree of satisfaction with the answers about biotechnology

	Very satisfied	Satisfied	not sure	dissatisfied	very dissatisfied	No answer
AEWs	0.79%	25.20%	58.27%	7.09%	0.79%	7.87%
CHWs	0.00%	12.13%	70.04%	5.83%	3.88%	7.32%
BIOSTs	0.00%	25.93%	62.96%	7.41%	0.00%	3.70%

About the same percentages of AEWs and BIOSTs (25%) thought that the public was satisfied. This is twice as many as those of CHW group who shared the same opinion. For those who thought that the public was dissatisfied, however, the percentages are more or less the same in every group.

In relation to the claims of not having enough information and having no easy access to sources of information, it is possible that the respondents did not have enough confidence to give information to the public. Thus it may be that many of them were not sure if they had satisfied the public because of the limited information they themselves had. It is quite clear that there is an urgent need to improve the accessibility to the sources of information for the AEWs and CHWs.

3.8 Preferred Form of Information about biotechnology

The responses to the question that asked about the form in which the respondents would like to get the information about biotechnology indicate different conditions in the workplace as well as different preferences of the officers.

Table 3.8.1 Forms of information about biotechnology chosen by the respondents in each group

Note: This question allowed the respondents to have more than one choice

	Radio programs	Newsletters	TV programs	Column in newspaper	Exhibition	The internet	others
AEWs	4.63%	38.43%	19.91%	16.67%	7.41%	5.56%	7.41%
CHWs	4.02%	35.91%	28.17%	18.27%	1.86%	8.67%	3.10%
BIOSTs	7.41%	16.67%	16.67%	12.96%	11.11%	35.19%	0.00%

Similar trends are found in the groups of AEW and CHW, with the first three preferable sources of information being the same. These were newsletters, TV programs, and specific columns in newspapers. The majority of BIOSTs (about 35%), on the other hand, chose the Internet as their preferred source of information whereas only about 6% of the AEW group and 9% of the CHW group chose this source. Newsletters and TV programs were the second priority in the BIOST group. Surprisingly, radio programs were the least preferable source of information for both AEWs and BIOSTs. Even though it is not the least in CHW group, only 4% of CHWs used this source.

3.9 Other opinions

In addition to the data obtained through various questions asked in the questionnaires, the respondents had also expressed their views on many other topics. Following are some of the opinions of the respondents, which are representatives of a number of similar responses.

3.9.1. A need for training

“[The government organization responsible for the public awareness of biotechnology] should organize an educational seminar for both government and private sectors to disseminate knowledge and information as well as the present situation about the technology. A public activity such as a celebration of biotechnology should be organized to publicize the current information that is reliable and trustworthy.” (a CHW respondent).

3.9.2. Lack of good collaboration among government organizations

“There are so many good academics and experts in Thailand, but there is a lack of collaboration between different organizations. We should develop more collaboration so that the integration and top up strategy can be successfully implemented....” (an AEW respondent).

3.9.3. Needs for research and development

“[The government] should conduct more research in agricultural biotechnology in Thailand before disseminating the information to the public” (an AEW respondent).

“The AEWs still lack knowledge about biotechnology. They don't know whether the technology has any bad effects on environment, consumers, or even the producers themselves. The government organization that is responsible for this area and related ones should conduct serious research” (an AEW respondent).

3.9.4. Effective legislations and responsible bodies are required.

“If the technology is shown to be safe, it should be certified by a government agency. A group effort between the government and private sector should be initiated to disseminate information about the pros and cons of biotechnology to the farmers and general public” (an AEW respondent).

3.9.5. Ethical issues

“Biotechnology should be owned by the public, not by an individual body. The application of this technology should be done consciously and must not contravene our moral standards – human cloning, for example.” (Ibid, p.174)

“If biotechnology is to be used, it should be used in a way that won't go against the moral standard and the public conscience.” (an AEW respondent).

“Biotechnology should be developed for the sake of the community as a whole not just for commercial purposes.” (a BIOST respondent).

3.9.6. Concerns about environmental effects

“This technology might affect the ecosystem and the environment might be changed, some living things might be extinct; however, it might also be very useful in improving the living conditions of all living things and extend their lives. Nevertheless, there is not enough information that can lead to any conclusion yet” (a CHW respondent).

In general, therefore, the three groups were all conscious of the need for improvement in their relationships with the public. They were aware of their lack of competencies in communicating science with the public. Consequently, their opinions should be carefully considered and more effort should be put in trying to solve the existing problems. More collaborations between stakeholders, such as government organizations, scientists, as well as private sector should be developed.

4. Conclusion

Even though the majority of the government officers who work closely with the public acknowledge that public awareness of biotechnology is very important, the results from this study indicate that their knowledge of biotechnology is slight. They declared that they do not have enough information themselves to be of assistance to the public. There is a clear difference between those who work closely with the public in regional areas and the scientists who work mostly in the capital city in the availability and accessibility to the sources of information. Problems regarding lack of networks between the government organizations and lack of proper trainings relating to important science topics were also raised and defined as a major problem that leads to difficulties in the accessibility of the right sources of information. This study has indicated that to raise the competencies of the government officers who work as science communicators should be identified as the first priority in the mission of raising the public awareness of science. It has underlined an urgent need of a more proactive approach to bridge the gap between scientists and other government officers to help raising the science awareness and competencies among the government officers in order that they can consecutively and successfully complete their mission in raising the public awareness of science.

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