POLICY BRIEF
VOLUME I, NO. 5

Personal Constructs and Social Discourses on Genetically Modified Organisms (GMOs)

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INTRODUCTION

Mass media play a crucial role on how scientific information is disseminated to the public, and how technology is accepted or rejected within societies. Public debates on genetic modification or biotechnology have been observed to be dominated by two message frames. These are: first, advances in genetics and genomics, which aim to provide treatment for diseases; and, second, applications in agriculture and food production such as cloning and stem cell research. According to Hellsten and Nerlich (2008), the latter, which may be used to produce genetically modified organisms (GMOs), often portray scientists as that of playing God. The authors added that the use of biotechnology for medicine was more acceptable to the public since it holds the key to curing diseases and a promise of longer life.

Message or narrative frames (or key messages or story lines grouped together in support of a particular message) in biotechnology more often than not pertain to agriculture and food production, or medicine. Both message and narrative frames (that of agricultural production and medicine) suggest the linearity in the way biotechnology is currently viewed by the public. Such narratives may contain metaphors and frames that play an important role in the communication of science, and have a direct impact on public opinion and, eventually, government policy. Such entrenched metaphors and frames can likewise contribute to the misunderstanding of the science itself.

According to Navarro (2011), agricultural or crop biotechnology is one application of genetic modification that has sparked worldwide interest and debate. Encroaching on relevant themes such as food safety, biodiversity, environmental risks, and resource distribution, competing metaphors and frames have influenced the acceptance or rejection of the technology. Growing food deficits that require massive boosts to agricultural systems have supported the roll out of crop biotechnology worldwide. However, ecological balance, environmental risks, and socially perceived imbalances of power among key stakeholders (such as government, private corporations, and farmers) have somehow hindered its implementation in some areas (Thompson, 2011).

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PERSONAL CONSTRUCTS AND SOCIAL DISCOURSES ON GENETICALLY MODIFIED ORGANISMS (GMOS)

This research explores how the public makes sense of message frames used by the government when disseminating information about genetic modification or biotechnology. It also explores the public's (specifically, farmer leaders and traders) personal constructs about the science, and how these aid them when participating in societal discourse about GM crops.

In the context of the study, message frames refer to how messages on GMOs are primed or crafted by concerned government agencies when sharing information about biotechnology. Popular themes could be on the science of biotechnology and its applications; food and feed safety assessment, and labeling; environmental safety assessment; regulation; and global trade. Popular slants may be: cultural/social, economic, political, environmental, and ethical/religious. These can be further categorized into: potential or promise (economic); fear; ethics; and human intervention – with the last three categories suggesting ethical and religious concerns.

Personal and social constructs refer to the meanings and understandings attributed by the public to their individual experiences on GMOs and crop biotechnology. Social constructs are formed and validated through societal discourse --- which can either weaken or strengthen a person's stance towards genetic modification as an accepted science.

METHODOLOGY

This research employed the mixed methods research design in answering the research problems as to how messages on GMOs and crop biotechnology are communicated to farmer leaders and traders in the Philippines, and how do they make sense of scientific information, and use this information to participate in societal discourse regarding the technology. According to Creswell and Plano Clark (2007, 2011) p. 5, *mixed methods research design* is defined as:

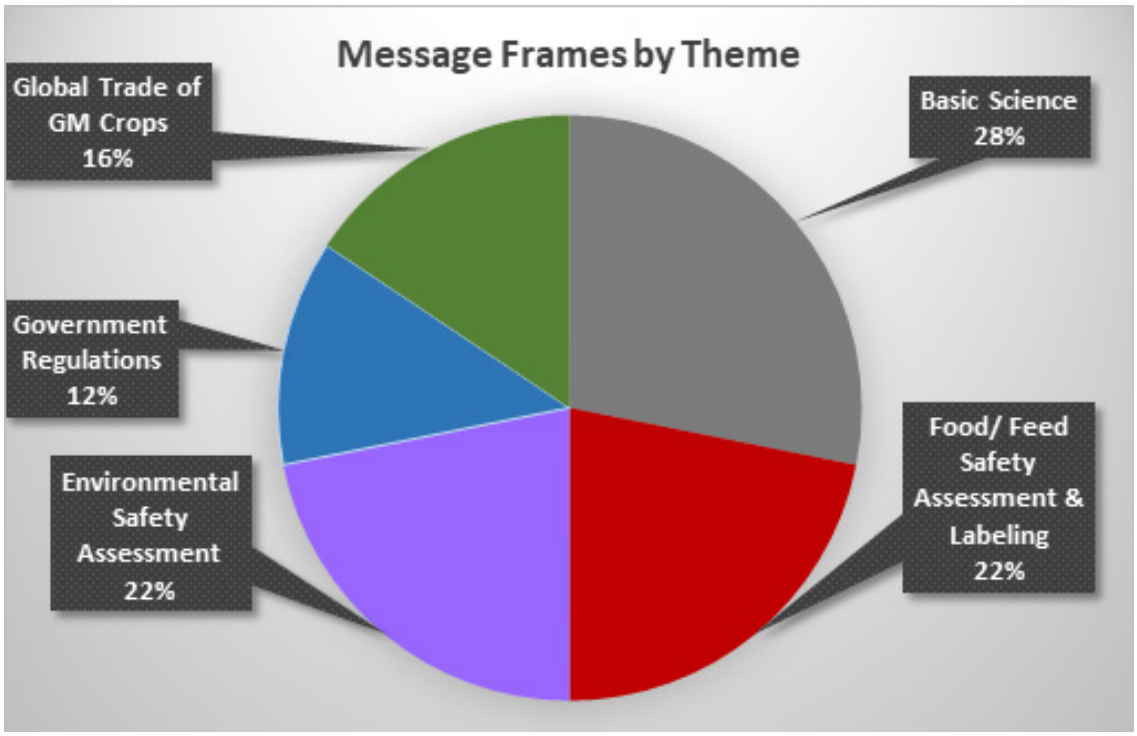
> *A research design with philosophical assumptions as well as methods of inquiry; As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis and the mixture of qualitative and quantitative approaches in many phases of the research process. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone.*

In this research design, the multi-research methods used were: key informant interviews (KII) and focus group discussions (FGD). KIIs were used to analyze the current thrust of selected government agencies who play a key role in the research, regulation and monitoring of GM crops in the Philippines, and the common themes that are generally communicated to explain crop biotechnology. KIIs along with FGDs provided depth as to how selected farmer leaders and traders understand and make sense of scientific information about GM crops, and how do they utilize message frames to enable them to participate in societal discourses about crop biotechnology.

SUMMARY OF RESULTS

Five themes were used when communicating the concept of crop biotechnology and GMOs to farmer leaders and traders **(Figure 1)**. These themes are: the basic science of biotechnology, food and feed safety assessment (which includes labeling), environmental safety assessment (which includes pest management, pesticide or chemical use, biodiversity, climate change mitigation, and environmental degradation), government regulation, and global trade of GM crops.

Figure 1. Common Message Frames from Government Agencies by Theme



Farmer leaders and traders form personal and social constructs as they make sense of key messages framed by the different government agencies. Personal constructs are largely dependent on how much they know about the technology and how much they perceive it will benefit them. Social constructs, on the other hand, as strengthened by social discourse tends to validate personal constructs, but is not a guarantee that it will sway or change an individual's belief about the technology. Personal constructs, however, are strengthened if the social constructs or beliefs within the community are consistent with the individuals'.

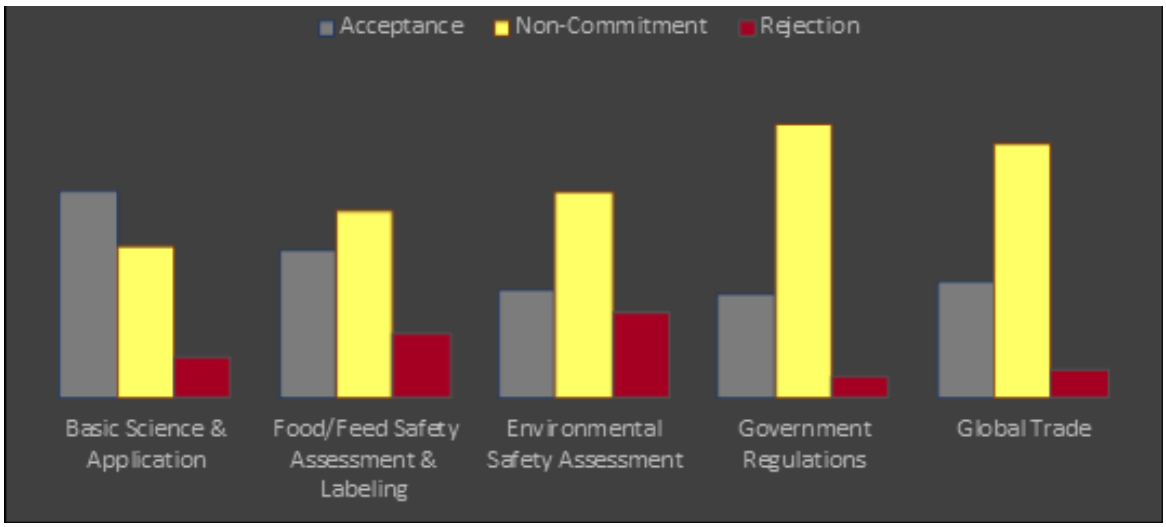
Despite the interviewees' claim of low knowledge and understanding of crop biotechnology and GM crops, they have various ways of working out the knowledge gaps when engaged in societal discourses. Based on the results of the study **(Figure 2)**, personal constructs are solid, concrete and well-founded in terms of the basic science of biotechnology and its applications. However, as food and environmental safety are major concerns as expressed in personal constructs, when engaged in societal discourses, these social constructs tend to carry more complex themes such as government regulations, global trade of GM crops, and economic competitiveness.

Overall, trust in the science is the most important predictor for personal constructs and eventual engagement in societal discourse. However, the creation of trust still depends on how farmer leaders and traders make sense or understand information from various sources.

The ability to understand the science of crop biotechnology stems from the farmers' experience through years of farming, while traders usually acquire information based on their interactions in the marketplace and with agri-biotech companies. Level of knowledge predicts conversations or societal discourse about GMOs and crop biotechnology among the farmer leaders and traders as they try to make sense of it.

Resistance to GMOs, GM crops and crop biotechnology is low in provinces that are considered top producers of rice, corn and eggplant. Albeit regulation of the technology is unclear to them in terms of processes undergone, farmer leaders and traders (especially the former) still rely on government to make the right decisions in terms of regulation of GMOs ---albeit the blatant, distrust and refusal of the technology altogether by anti-GMO groups.

Figure 2. Farmer Leaders and Traders' Personal Constructs vis-a-vis the Various Latitudes



Data also showed that although people who are highly-educated may have a higher propensity to understand the benefits and risks of the science, such as farmer leaders and traders who are college graduates, findings suggest that there is no impact on analyzing long term effects of the science --- what is of major concern for both stakeholders are the economic benefits that will be gained from its use, and the ease of farming that will be experienced (zero tillage, less pesticide use, etc.).

Also, one's education level is also not a guarantee of the amount of trust placed on science itself. A person may understand the science, but remain untrusting of its benefits. What is also important is the enabling environment wherein the public acceptance and understanding of science is situated. People may remain personally distrustful of science, but if the environment around him/her says otherwise (or is supportive of science), then these may also have an impact on the formation of constructs in the long run.

People who have less or belong to lower income brackets tend to be more accepting of biotechnology because they see it as a means of empowerment and of having better lives. Farmers who are small holders and considered as resource-poor, are more likely to agree that the benefits of agricultural biotechnology exceed the risks, that biotechnology will be beneficial to them, and that it is morally acceptable.

On the other hand, progressive farmers see biotechnology as as means of enabling themselves to play in international marketplaces, and see it as a means to be able to export their products. With the upcoming ASEAN integration, progressive farmers and traders see the adoption of biotechnology as a means to access global consumer markets – this in light of pending issues related to biosafety regulation and intellectual property rights.

Although biotechnology adoption is seen as a major element in the promotion of Philippine agricultural development, the communication gap may be well placed in the numerous communication channels and networks involved in its public advocacy efforts --- this on top of concerns that regulatory efforts need to be harmonized. Thus, future science communication efforts need to be based on a systematic and empirical understanding of the audience's values, knowledge, and attitudes in relation to their respective interpersonal and social contexts. Efforts to explain the science must be based on the information that remains unclear to people, and provide direct explanations for issues and concerns raised.

Preferred media sources and communication channels should also be taken into account. Proponents and critics of the technology should likewise be able to stand on common ground and compromise on the issue. Recent communication theories have recognized the importance of the social negotiation of meaning as part of societal discourse and the decision-making process. In other countries, roundtable discussions between proponents and critics can take place – perhaps this is one strategy that needs to be encouraged in the Philippine context.

At present, the public debate between the proponents and critics is confusing farmer leaders and traders instead of empowering them by giving them the information that can help them gain control over their own lives. Biotechnology, like any other technology, can empower people enough to hold the government and its regulatory bodies accountable for decisions made.

CONCLUSIONS

1. Message frames that government used to share information about GMOs and crop biotechnology focused on five themes: the science of biotechnology and its applications; food and feed safety risk assessment, and labeling; environmental safety risk assessment, government regulations; and global trade of GM crops.
2. Farmer leaders and traders acquire information about GMOs through two channels: traditional mass media channels (TV, radio and print), and through face-to-face communication with family, relatives, and other farmers or traders; or with agri-biotech companies. Farmer leaders and traders do not actively seek information about biotechnology.
3. GMOs and crop biotechnology are not common topics discussed among farmer leaders and traders. Information about the science or how technology was developed is deemed acceptable. More explanations are needed in relation to food and environmental safety risk assessments. Regulatory processes, although not understood completely, is trustingly placed on the hands of the government.

POLICY IMPLICATIONS

In the coming years, Asia will play a crucial role in determining how widely GM crops will be accepted on an international scale due to numerous developing countries in the region struggling to feed their populations. Asia is also the world's largest consumer base, is home to the greatest number of GM farmers, and is a key importer of GM foods. These factors combined create a high potential for the region both as a consumer market and as a potential agricultural production area. Many Asian countries have also been particularly active in developing and using crop biotechnology.

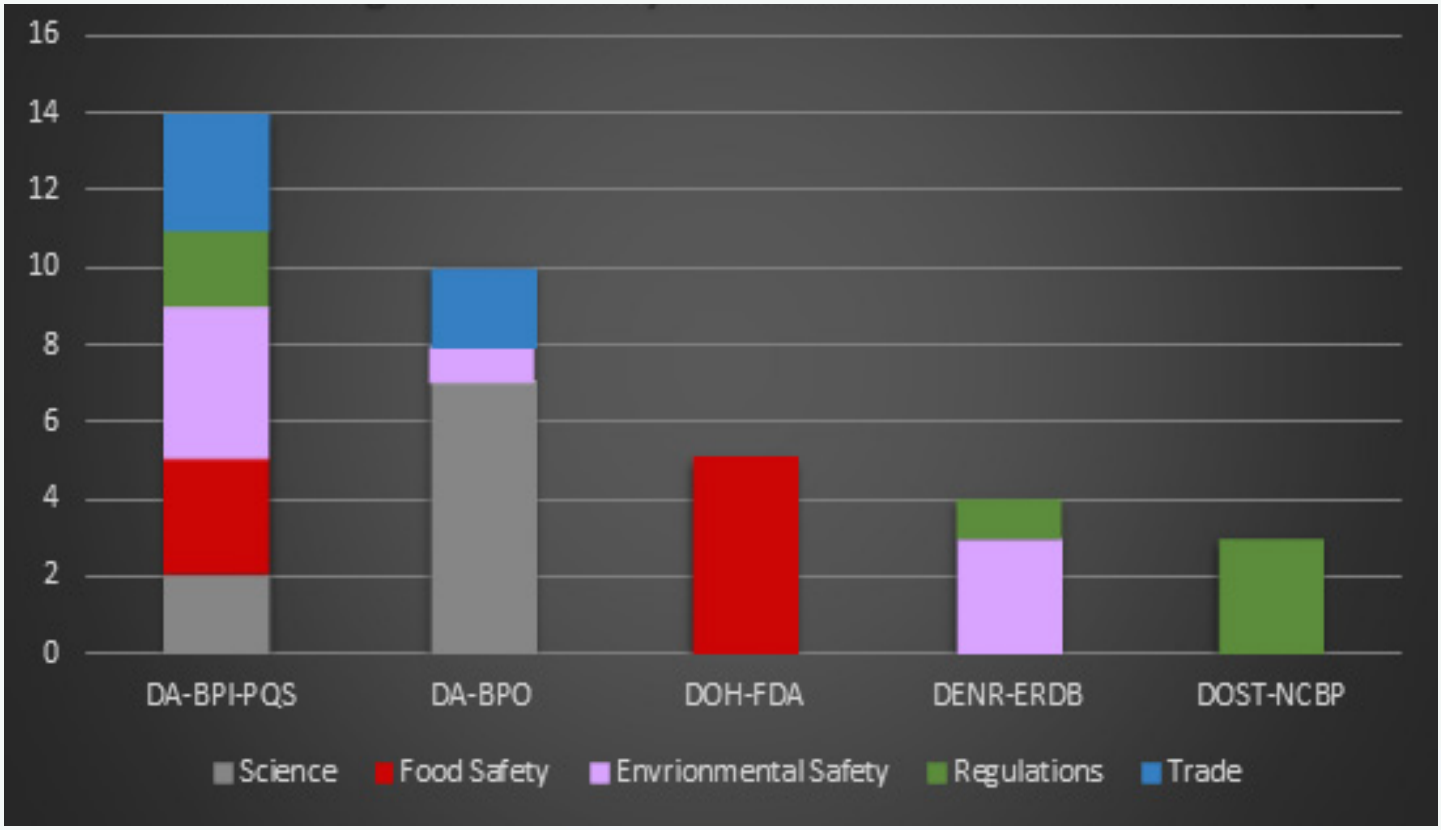
At present, Filipino farmers are challenged as to how to benefit from the application of modern biotechnology in a country where biosafety regulation and intellectual property management frameworks are still considered as topics of societal discourse.

Hegemony and power struggles currently occur among the different stakeholders in the biotechnology arena. While mass media may be seen as promoting messages in favor of the dominant ideology to maintain the status quo in the agricultural sector, government agencies may be seen as promoting technologies that could benefit the elite in society.

Developments in biotechnology are often viewed within a specific cultural framework wherein advancements are seen as economic actions, and scientific information as concepts that flow within a global economic setting. Current message frames on GMOs may be related to the open market system that is dominated by multinational companies. Thus, opening up the possibility that the social discourse pertaining to GMOs may not be centered on the technology itself, but on how its adoption affects economic development and global trade in the long run.

In the context of this research, the message frames that government used to communicate information about GMOs, GM crops, and crop biotechnology were focused on five themes, namely: the science of biotechnology and its applications; food and feed safety risk assessment, and labeling; environmental safety risk assessment, government regulations; and global trade of GM crops. Most of these key messages are shared separately by each agency as needed, and are not harmonized as a regulatory process. A particular government agency communicates messages that may be aligned to his/her agency's thrust but overlapping messages that are reflective of other agency's mandate can be communicated

Figure 3. Common Message Frames from Government Agencies in terms of Accountability



(Figure 3). Also, since regulatory agencies are not allowed to do communication campaigns about the technology they regulate, most of the information shared with the public are based on what they think that the public should know when issues and concerns are raised.

Farmer leaders and traders acquire information about GMOs through two channels, namely: traditional mass media channels (TV, radio and print), and through face-to-face communication with family, relatives, and other farmers or traders; or with agri-biotech companies who sell the biotech seeds. Farmer leaders and traders do not actively seek information about biotechnology, but are considered as passive information seekers --- meaning, if they chance upon relevant information, they read or listen to it. What is effective though are testimonials from other users of the technology about the economic benefits that can be gained because of its usage.

Information that is clear as crystal to farmer leaders is the science of biotechnology and its applications. The study revealed that government did a good job in explaining the science to this stakeholder group. However, belief in the technology may encourage farmers to patronize counterfeit seeds or do unguided interbreeding on their own. This imply that perhaps government should take measures towards the regulation of the prices of biotech seeds, and the legality of the existence of local biotech companies that sell counterfeit seeds. What needs more explanation, in terms of message frames, are those related to food and environmental safety risk assessments that are continuously drummed up by critics of the technology. Farmer and traders' concerns about food and environmental safety are set aside because of the promise of high yields, less farm inputs, and minimized pesticide use.

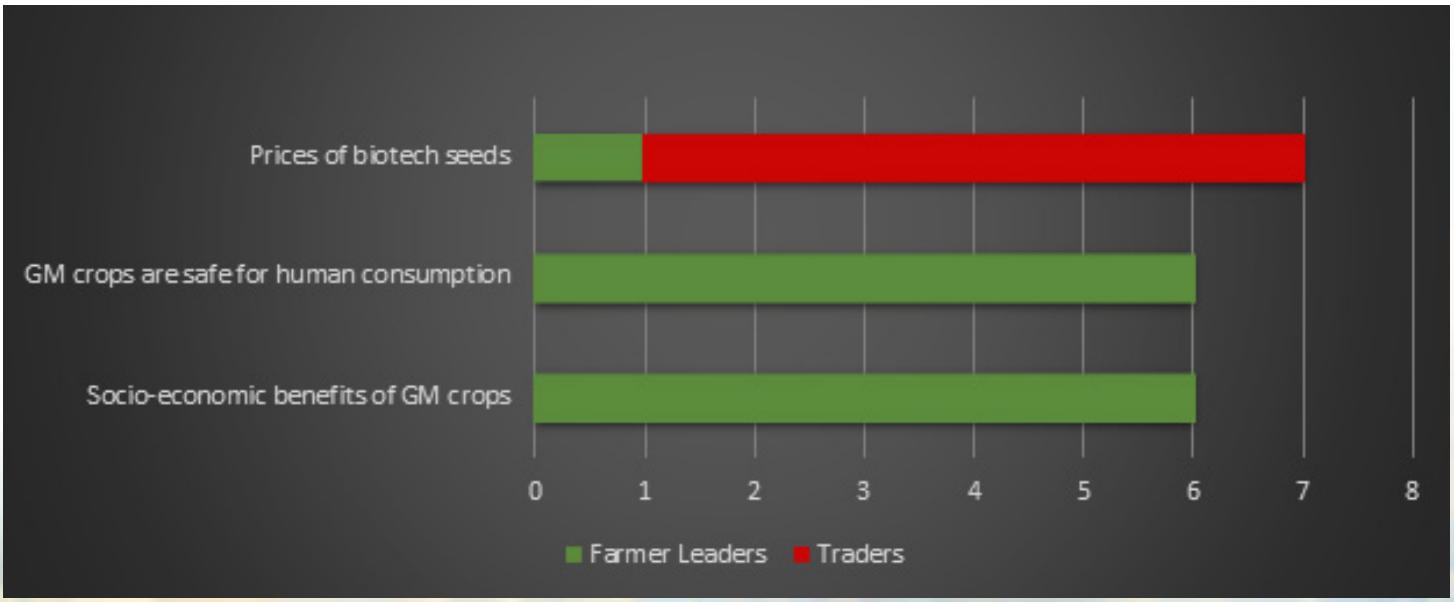
Regulatory processes, although not understood completely by some stakeholders, is trustingly placed on the hands of the government. Despite the trust given to government in terms of regulations, there is a tendency to question its decisions and biases, especially when multinational seed companies are involved. The five government agencies included in the study are aware that what they exactly do in terms of regulation and monitoring should be communicated to the general public --- or at least, the processes involved. Findings also revealed that the placement of trust in sources of information appears to be volatile in the context of Filipino culture. People tend to trust government more about matters pertaining to science, and trust scientists less when the latter should be seen as the key authority on the matter.

During farmer and trader gatherings, GMOs and crop biotechnology is not a hot topic that they discuss nor is it something that they debate about. This suggests that science really is not a public interest. However, biotechnology encourages social discourses on prices of biotech seeds, production oversupply, lack of marketing schemes, and competitiveness with other ASEAN countries in terms of trade **(Figure 4)**. Farmer leaders and traders form personal and social constructs as they make sense of key messages as framed by the different government agencies. Personal constructs are largely dependent on how much they know about the technology and how much they perceive it will benefit them. Social constructs, on the other hand, as strengthened by social discourse tends to validate personal constructs, but is not a guarantee that it will sway or change an individual's belief system.

Although biotechnology adoption is seen as a major element in the promotion of Philippine agricultural development, the communication gap may be well placed in the numerous communication channels and networks involved in its public advocacy efforts. Thus, future science communication efforts need to be based on a systematic and empirical understanding of the audience's values, knowledge, and attitudes in relation to their respective interpersonal and social contexts. The enabling environment in which such awareness and understanding should likewise be considered.

In the long run, perhaps there is a need to go back to basics, and first develop among the general public a solid foundation for the understanding and appreciation of science.

Figure 4. Biotech Issues that are Discussed in Societal Discourses



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Elliptical Road, Quezon City, Philippines
http://biotech.da.gov.ph/

Bureau of Agricultural Research
RDMIC Building, Visayas Ave. cor. Elliptical Road, Diliman,
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