

## Risk Communication

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### Abstract

Although risk communication is considered an integral part of the risk analysis process for genetically modified crops, many, if not most, regulatory authorities struggle with the tasks of engaging stakeholders in the regulatory process and effectively exchanging information with them. The situation is made more complicated by controversial issues impacting the regulation of these crops and the fact that stakeholders perceive risks differently from regulators. This article provides some practical suggestions to implementing a more effective risk communication approach within the context of assessing risks from genetically modified crops.

*Keywords:* mass media, risk communication, risk perception, regulatory decision-making, regulatory transparency, social media, stakeholder engagement.

### Riassunto

Sebbene la comunicazione del rischio sia considerata parte integrante del processo di analisi del rischio per le colture geneticamente modificate, molte, se non la maggior parte, delle autorità che si occupano delle normative incontrano difficoltà nel coinvolgere le parti interessate nel processo normativo e nell'efficace scambio di informazioni con esse. Questa situazione è resa più complicata dalle controversie che hanno un impatto sulla regolamentazione di queste colture e dal fatto che le parti interessate percepiscono i rischi in modo diverso dalle autorità di regolamentazione. Questo articolo fornisce alcuni suggerimenti pratici per implementare un approccio di comunicazione del rischio più efficace nel contesto della valutazione dei rischi derivanti da colture geneticamente modificate.

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## 1. INTRODUCTION

Before genetically modified (GM)<sup>1</sup> crops can be cultivated or used in food and feed, every country (except the few with moratoria in place) requires that risks to environmental resources and human health should be assessed and appropriately managed. Both risk assessment and risk management are science-based processes involving the collection and evaluation of highly technical, and frequently voluminous, data to inform regulatory decision-making. To date, environmental risk assessments and food safety assessments have been issued on almost 500 different GM crop varieties (ISAAA, 2018), representing thousands of individual regulatory decisions. Ostensibly, all of these decisions have been made using internationally approved methods and standards (see, for example, OECD, 1986; 1993; 2007; 2010; Secretariat of the Convention of Biological Diversity, 2000). However, when it comes to communicating with stakeholders about these regulatory decisions, there seems to be no consistent method followed. For example, some regulatory authorities, such as those in Australia (OGTR, 2018; FSANZ, 2018), Canada (CFIA, 2018; Health Canada, 2018), the European Union (EFSA, 2018), and the United States of America (APHIS-USDA, 2018; USEPA, 2018; USFDA, 2018), publish their decisions regarding GM crops as well as the associated environmental risk or food safety assessments. Other countries, such as Sudan (National Biosafety Council, 2015), publish the decision document but not the assessment underlying the decision, whereas yet others, such as China (Biosafety Management Office of Agricultural GMOs, 2008), publish an announcement that a decision has been made but provide neither the assessment nor the decision document itself.

Typically, the volume of information released by any regulatory authority at the end of the decision-making process for a particular risk assessment reflects the amount of information that was exchanged with stakeholders during the deliberative process preceding the final decision. Unfortunately, this exchange of information, commonly called “risk communication”, is challenging for many regulatory authorities for a host of reasons, such as a lack of resources, lack of training or lack of political will; consequently, some governments do risk communication badly or not at all. Even those governments that expend considerable time and resources to communicate with stakeholders throughout the deliberation process for a GM crop may be hard-pressed to claim that they do it “well”; they can only say they do it as best they can.

This article will attempt to explain what risk communication is, what role it plays in assessing and managing the risks posed by GM crops and how a risk communication

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<sup>1</sup>Genetically modified crops are those produced through modern biotechnology. “Modern biotechnology” means the application of: (a) *In vitro* nucleic acid techniques, including recombinant deoxyribonucleic acid (DNA) and direct injection of nucleic acid into cells or organelles, or (b) Fusion of cells beyond the taxonomic family, that overcome natural physiological reproductive or recombination barriers and that are not techniques used in traditional breeding and selection (Secretariat of the Convention of Biological Diversity, 2000).

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programme can be built in a series of manageable steps. It will also attempt to convey the fundamental challenge of risk communication: that it is not an analytical process, which is something that risk assessors have been trained to master, but instead a personal process.

## 2. THE IMPORTANCE OF RISK COMMUNICATION

In order to make sound decisions regarding the assessment and management of risks posed by the development and use of GM crops, regulators must have high quality, relevant information (Fischhoff & Kadvany, 2011). Risk communication is the process which provides, exchanges or obtains such information and facilitates engagement with stakeholders regarding risk (National Academy of Sciences, 2016). Risk communication is integral to the assessment and management of risks associated with the development, importation and use of GM crops. Risk assessment involves evaluating the probability that a particular hazard will cause harm to a valued resource, such as biodiversity or human health. During the assessment process, risk communication ensures that the scope and boundaries of the assessment are clearly described, the criteria used to make decisions about risk are clearly defined, stakeholder interests are considered and feedback is provided. Although risk communication has an educational component, it does not attempt to change basic values and beliefs (Gough, 1991); instead, regulators acknowledge the existing values and beliefs and incorporate them, when appropriate, into regulatory decision-making (Lofstedt, 2004).

Risk communication also includes explaining to stakeholders how the regulatory system works, how regulatory decisions are made and what the decisions mean (OECD, 2002). For any regulatory system, including one for genetically modified organism (GMOs), building trust involves demonstrating regulatory rigour: specifically that the regulations are strictly enforced and that breaching the regulations results in an appropriate penalty. Moreover, risk communication must reinforce the fact that regulators are neither proponents for nor opponents of modern biotechnology but impartial observers who are required to communicate to both the government and the public on matters relating to the risk assessment and risk management of GMOs. Regulators should also strive to demonstrate openness by listening to stakeholders and holding themselves accountable for errors. The regulatory system must be as transparent as possible, especially because the technology behind GM crops is difficult for most stakeholders to fully understand. By providing stakeholders with a transparent view of the regulatory process, risk communication efforts also build trust in the process and the people behind it (Renn, 2006; National Academy of Sciences, 2016). As such, risk communication is an expression of the social contract that a government has with its stakeholders (Fischhoff & Kadvany, 2011) and can therefore be considered integral to the regulatory oversight of GM crops (OECD, 2002; WHO, 2008; OGTR, 2009; Jansen Van Rijssen *et al.*, 2015).

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Because risk communication is so important to the effective regulation of GM crops, it is incumbent upon regulators to do it well. When risk communication is done poorly or not at all, the information necessary for decision-making is not effectively collected, resulting in bad decisions. In addition, poor communication discourages stakeholders from engaging in the regulatory process and undermines public trust in regulators and their decisions (WHO, 2008; Fischhoff & Kadvany, 2011). Ultimately, poor or non-existent risk communication wastes government time and resources, since bad decisions must be revisited, or worse, must be resolved in court. Of course, good risk communication is not easy, and there are many reasons why a particular communication effort may be unsuccessful. First and foremost is that a decision with regards to the regulation of a GM crop involves voluminous, highly technical data, most of which is challenging for stakeholders to understand. In addition, the regulation of GM organisms is a highly controversial topic, and some stakeholder groups may feel that the science underlying the technology is contested. Another complicating factor is that the informational needs of various stakeholder groups are different, and regulators may be challenged to deliver the appropriate message to the right audiences at the optimal time.

### 3. RISK PERCEPTION

A key challenge facing anyone who has the responsibility to communicate risk to stakeholders is that the concept of risk is perceived differently by different people. Several theories and psychological models try to explain why people perceive risks differently (Slovic, 1987; Kunreuther, 2002; Fischhoff & Kadvany, 2011). For example, many people find it difficult to comprehend extremely remote risks, such as the risk that a GM crop will become a new invasive species (Nelson, 2001). In addition, most people do not understand that risk is a function of two components – hazard and exposure to that hazard. As a consequence of this misunderstanding, they may focus solely on either the hazard or the exposure component; in so doing, they have a skewed perception of the risk (Gaskell *et al.*, 2004). In addition, questions on topics such as food safety and environmental sustainability raise an emotional response in some stakeholders, especially when they cannot perceive a benefit to themselves (Nelson, 2001; Gaskell *et al.*, 2004), thus making it difficult for them to focus on facts presented by regulators.

Scientists specialising in the study of risks have observed that those most likely to result in serious harm are not necessarily the ones about which the public are the most angry and fearful (Sandman, 1987). In looking at this mismatch in risk perception, the concept of “outrage” can be useful to inform risk communication efforts. For example, recent data indicate that, on average, over 1.2 million people die in automobile accidents each year (ASIRT, 2018), which should generate a great deal of apprehension, if not anger, in the public’s mind. Yet it can be argued that most people regularly get behind the wheel without considering the very real risk of death. According to Sandman (1987), the mismatch between actual risk and perception of

risk is due to the concept of control: when behind the wheel, a driver feels in control of the situation, which minimises the perception of the actual risk. The more that people feel that a risky situation is out of their personal control, the more outrage they feel about the risk. Several such outrage factors can skew a person's ability to perceive the magnitude of a particular risk (see Table 1).

**Table 1. Outrage factors** (adapted from Sandman, 1987)

Outrage factor	Definition
Voluntariness	The extent to which an outcome is chosen by or forced upon a person.
Control	The extent to which a person feels an outcome is under personal control.
Fairness	The extent to which the outcome is imposed equally on everyone.
Process	The extent to which the government has been honest and concerned about the outcome.
Morality	The extent to which the outcome is perceived as a social evil.
Familiarity	The extent to which the outcome is beyond the normal circumstances of everyday life.
Memorability	The extent to which similar past outcomes have remained in the public memory.
Dread	The extent to which the outcome is frightening to people.
Diffusion in time and space	The extent to which the harm is concentrated or spread over time and/or space.

Regulators may be tempted to consider these outrage factors as irrational or unrelated to the data used in the risk assessment process. In reality, however, these factors exist, for whatever the reasons, and they can impact how stakeholders will react to information about the development and use of GM crops. Understanding how risks may be perceived can help in ensuring the effective transmission and receipt of risk communication messages. Public meetings and other types of two-way communication may provide risk assessors and decision-makers with insights into psychological and social factors that may affect the perception of risk, and these insights should be incorporated into the formulation of subsequent risk communication messages. Risk communication efforts should anticipate and aim to address instances of stakeholder outrage, rather than trying to discount it. For example, to address the effects of dread and familiarity, regulators could say that the use of modern biotechnology creates genetic changes that are smaller than those created by techniques with which the public are already familiar and comfortable, such as wide cross-pollinations and mutagenesis.

Regulators and risk communication specialists will probably be forced to confront risk perception problems with each decision made regarding a new GM crop until the public gains confidence in the rigour and transparency of the regulatory system. This transition will take time and patience on the parts of both regulators and the public. Ideally, the relationship should evolve as it has in other mature regulatory systems. For example, very few people can explain how airplanes fly, yet most people are willing to board a plane without asking to inspect the cockpit or check the plane's tyres. In essence, some outrage factors still exist – airplane passengers have no control over the airplane, injury (should a crash occur) is concentrated in time and space, and the types of resulting injuries are surely a matter of dread. However, the public balances its outrage against its trust in the regulatory systems that oversee airplane safety and most people are confident that the regulatory system is working to protect them.

#### **4. IMPLEMENTING EFFECTIVE RISK COMMUNICATION**

Merely disseminating information on the government's regulatory programme for GM crops does not constitute good risk communication. Fischhoff (1995) argued that effective risk communication involves presenting the facts, communicating and explaining the facts, demonstrating that similar risks have been accepted in the past, and bringing stakeholders on board as partners. The development and use of GMOs, including their release into the environment, is of interest to a wide spectrum of the public, including regional and local governments, non-governmental organisations, community groups, businesses and individuals. Stakeholders' views should be considered necessary to provide input into the risk assessment and risk management processes (Fiorino, 1990). In addition to communicating with stakeholders, the government may also consult with any experts or interest groups with useful insights for decision-making.

Effective risk communication requires the government to: determine clear objectives for each communication effort; determine what information will be disseminated or collected; identify key stakeholders with an interest in the information; determine which media or forms of communication will be most appropriate; and decide on the timing of each part of the communication campaign. Lastly, the government should evaluate the effectiveness of each communication effort and determine whether the process needs to be adjusted. This all requires good planning, which should begin as soon as the regulatory programme for GM crops has been put in place (WHO, 2008).

##### **4.1. Risk Communication Planning**

Making the regulatory programme transparent to stakeholders is a key first step in risk communication. Risk communication can begin with an explanation of how the regulatory programme operates, which Ministries have responsibility for it, what obligations the applicant has to the government, what data will be collected and how the decisions will be made. Regulators should publish the authorising legislation and any regulations, policy statements and guidance documents that have been written to

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support the administration of the regulatory programme. From a practical standpoint, the most cost-effective way to accomplish this is through both the Ministerial website and the Biosafety Clearing House. This approach ensures that stakeholders and the global community know that a fully functional programme is in place and that the government is being transparent about how it works to protect human health and the environment. A freephone number or an e-mail address can be provided for anyone wishing to make enquiries, request hard copies of documents or express particular concerns. Depending on the available resources, the government may also use other approaches to disseminate this information, for example, by producing print materials, such as brochures, or posting materials on the Ministerial Facebook page.

Next, regulators should plan risk communication campaigns based on the most likely regulatory scenarios so that risk communication efforts are implemented efficiently. For a country with a nascent regulatory programme for GM crops, the most likely scenario is that an importer will apply to bring a GM crop variety that is currently being traded internationally into the country. If this is identified as the most likely scenario, the regulators will have a clear idea of the objectives of their risk communication efforts and what information they are likely to be working with. Food and feed safety questions will be in the minds of stakeholders, and regulators should be ready to provide answers. As the GM crop variety will therefore have an established history of international trade and use, a wealth of information should already be available. Regulators should examine the regulatory processes associated with such an application and consider when communication efforts are appropriate and what information will be disseminated or collected. For example, in this scenario, what, if anything, will be done from a risk communication standpoint at the following stages:

- when the importer's application is received;
- when the regulators have finished reviewing the application;
- when the regulators have produced a draft food safety assessment;
- when the regulators have finalised the safety assessment; and
- when the final decision has been issued.

At each of these stages, regulators may be providing information, collecting information, or both, depending on the needs of the communication plan. Messages may be exchanged via print, mass media or social media; alternatively, regulators may have face-to-face meetings with stakeholders. The choices may be different for each of the identified stages in the process. Later sections will discuss the value of one-way versus two-way communication and the selection of media in more depth.

By planning in advance for these predictable risk communication needs, communicators will develop the practical experience needed when more novel circumstances arise, such as an application for cultivation. Of course, planning should go beyond a mere paper exercise: materials should be developed in anticipation of the application. Although regulatory resources are always tight, this preparation can be accomplished in a way that maximises resource use. For example, producing guidelines on the systematic analysis of food safety questions based on data from the

applicant, other regulatory decisions and the published literature will be a valuable exercise, regardless of when the first application arrives.

Although planning individual communication activities is important, it is crucial that the government also plans its philosophical approach to risk communication and makes the commitment to follow through with it. Therefore, the government needs to make the following commitments:

- Risk communication will be a part of each regulatory decision.
- The government will consider diverse stakeholder viewpoints in setting the scope of risk assessments.
- The government will communicate honestly with stakeholders, while protecting personal privacy and confidential business information.
- The government will not make final decisions without listening to stakeholder concerns and accepts the possibility that a preliminary decision may need to be altered to accommodate these concerns.
- The government will follow up with stakeholders regarding the results of regulatory decision-making.

#### **4.2. Identifying Key Stakeholders**

It is tempting to plan risk communication efforts as if all stakeholders are the same, that is, to develop a single high-quality message and then transmit it to all stakeholders. However, in reality, there could be many subpopulations of stakeholders with different information needs. Some stakeholders have a very narrow focus: for example, their only concern may be the impact of the regulation of GM crops on trade. Others may have a broad interest but do not understand the technology behind the development of GM crops, whereas yet others may have no specific interest but only need to know that the government is doing its job. Regulators must therefore think about risk communication in terms of the various audiences (i.e. specific stakeholder groups with a particular interest in the issue of regulating GM crops) and develop appropriate messages for each group.

Many of these audiences will already be well known to the regulators because they have been encountered in the context of other agricultural issues, such as farm productivity, sustainable biodiversity, food safety and trade in agricultural commodities. These special interest groups will be familiar, as will the best means or media to contact them. For example, farmers may be effectively reached through agricultural extension agents or farm reports on the radio, and regulators should plan their communication with these groups accordingly. However, the issue of GM crops has driven new special interest groups to coalesce, for example, food labelling advocates and supporters of the rights of indigenous peoples, with whom regulators have little or no familiarity or knowledge on how best to contact them.

Therefore, early in the planning stages for risk communication, regulators should identify a list of stakeholder groups for which they intend to develop specific messages or for which they intend to use specific means or media to contact. At the start of the

planning process, there is a high likelihood of missing some audiences, but as the effectiveness of past risk communication efforts is evaluated, these groups will be identified. A partial list, in no particular order, is presented in Box 1.

#### Box 1. Partial List of Stakeholder Groups

- Farmers
- Food processors
- Biotechnology industry groups
- Consumers groups
- Importers/exporters
- Academia
- Other government agencies
- Food safety groups
- Environmental groups
- Religious leaders
- Grocers
- Non-governmental organisations
- Nutritionists
- General public
- The press
- Animal rights groups

For each identified audience, regulators should ask whether a message designed for the general public is appropriate and, if not, how the message should be customised. Some groups may need messages with a specific focus, others may respond to a technical message containing scientific data, and still others may need additional background or explanatory information to best understand the message. At the same time, regulators should identify the best media through which to contact each group.

During the final evaluation of any risk communication effort, regulators should revisit the list of stakeholder groups. For example, did an unanticipated group show interest in the regulatory action? Or did the regulators determine that two different groups were effectively reached in the same way, with essentially similar messages? Answers to these questions may suggest that the stakeholder list be revised so that future risk communication campaigns are more effective or more resource efficient.

### 4.3. Delivering the Message

Once audience-specific messages have been developed, regulators will need to identify the means to effectively deliver the messages to their intended audiences. Of course, the country's laws may specify how the public is to be provided notice of regulatory activity; if so, such laws must be followed. If, however, those laws set a minimum but do not proscribe the use of other methods, regulators should consider whether any additional means are appropriate. In selecting communication media, regulators have several considerations (Table 2).

**Table 2. Message considerations and impact on media selection**

Message consideration	Impact on media selection
Length of the message	A guidance document or policy statement may be best disseminated using a gazette or posted on the Ministerial website, while an announcement that a draft document is available for review may be sent as a tweet.
Content of the message	When a message contains important diagrams or images, a gazette or radio announcement may not be appropriate.
Need for feedback	A gazette announcement works well when no response is desired, whereas a public meeting is more appropriate when immediate feedback is needed.
Expected longevity of the message	The text of regulations will not change over time, so may be appropriate for a printed document, while a list of approved GM crops will change over time and could therefore be placed on the Ministerial website, where it can be updated regularly.
Urgency of the message	Messages that may need several levels of Ministerial approval before publication would not be appropriate for a tweet, since Twitter is meant for more urgent or timely messages.
Ease of access by the audience	Different audiences may be drawn to either traditional or “new” media; selecting only one means of publication may preclude some audiences from seeing the message.
Size of the intended audience	A government gazette or Facebook post may not reach everyone, depending on the audience.
Time and cost to transmit the message	A face-to-face meeting may cost a lot in terms of time and resources, whereas a tweet costs very little to produce.
Time and cost to monitor the message	A Ministerial website must be updated and monitored for feedback, with significant time and resource costs, whereas a gazette announcement has no <i>post hoc</i> costs.

Successful engagement depends upon providing suitable opportunities and procedures for dialogue (Renn, 2010). Processes for engaging with stakeholders range from public forums which provide the highest level of stakeholder involvement, to short announcements in the government gazette which provide simple, one-way communication. In addition, resolving specific concerns and issues related to human and environmental risks may involve highly technical questions for which the government may need to consult the applicant or subject matter experts. To help differentiate between methods of communication that might be used, examples of one-way and two-way communication (non-consultative and consultative) are provided in Box 2.

## Box 2. One-way and Two-way Communication Methods

### One-way methods

#### Examples:

- Government notices (gazettes, brochures)
- Ministerial website (no feedback provided)
- Newspaper
- Radio/television
- Facebook posts
- Twitter
- YouTube

#### Strengths:

- Some messages can be sent relatively quickly
- Some messages can be sent relatively inexpensively
- Government has greater control over content of the message
- Print materials have a long lifespan

#### Challenges:

- Lack of feedback
- Audience frustration
- Print material can be costly
- Internal Ministerial approval may delay some messages
- Radio and television messages have a short life span

### Two-way methods (non-consultative)

#### Examples:

- Documents published for comment
- Public meetings
- Formal hearings
- Speeches
- Open house events
- Ministerial website (feedback provided)
- Emails

#### Strengths:

- Feedback is received
- Stakeholder engagement is enhanced
- Transparency and trust is increased

#### Challenges:

- Feedback may not be useful
- Government has less control over the original message
- Lots of planning is necessary
- Intensive use of time and resources
- Feedback must be monitored
- Discussions can be confrontational or off-topic

### Two-way methods (consultative)

#### Examples:

- Meetings with subject matter experts
- Meeting with other government agencies
- Negotiations with applicant
- One-on-one conversations

#### Strengths:

- Information exchange is focused on specific issues
- Stakeholder engagement is increased
- Transparency and trust is increased

#### Challenges:

- Difficult to achieve diverse representation
- Records of consultations must be kept

#### 4.4. Using Social Media for Risk Communication

The use of social media, such as Facebook and Twitter, to disseminate information and news has grown exponentially in a matter of a few years; some governments are beginning to use these media to contact stakeholders and establish dialogues. However, owing to the novelty of these outlets and their ability to quickly evolve, it may be difficult to make the decision to incorporate these media into a risk communication campaign (OECD, 2013). Many regulators may already use social media to exchange personal information and understand the power of these media. It is tempting to incorporate them into risk communication campaigns as a seemingly low-cost way of rapidly providing information to stakeholders. However, it is best to take a cautious approach at first for several reasons (Table 3).

**Table 3. Advantages and disadvantages of social media**

Social media characteristic	Advantages and disadvantages
Immediacy	Information sent through social media goes everywhere, to a potentially huge audience, immediately. This places a huge responsibility on the regulator who clicks “Send” to post a message. On the other hand, passing a proposed message through many layers of internal approval may delay its posting for days, making it “stale” and of less interest to social media users.
Longevity	A quick tweet or Facebook posting essentially lives forever on the Internet. An innocent misstatement or inaccurate information is impossible to recall and can return to haunt regulators for years.
Resource needs	If regulators want to use social media to receive feedback, it becomes someone’s job to monitor and collect the feedback that is received. Many regulatory programmes do not have staff time to dedicate to this function.
Intensity	A simple tweet can inspire heated (and sometimes hostile) responses from anonymous users. Regulators are then placed in the difficult position of trying to moderate emotional discussions and correct erroneous statements made by others to reclaim the original intent of the message.

Before deciding to incorporate social media into risk communication campaigns on the regulation of GM crops, it is essential that regulators obtain a firm commitment from Ministry leadership, as well as resources to manage the media. It is a good idea to consider hiring a communications expert familiar with the use of social media for professional, rather than personal, communications. Such an expert should start slowly and cautiously; rather than rushing to post information they should monitor the individuals and organisations that are already talking about GM crops on social media in the country. The discussions and reactions of other users should also be monitored

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before deciding whether this environment would be productive for regulatory risk communication purposes.

If the decision is made to post information, it is best to begin by posting regulatory documents and policy statements that are already cleared for publication. This can then progress to providing links to credible sources of information on GM crops, either directly in Twitter or Facebook or through the regulatory website. As familiarity and confidence grows, social media can then be used to publish, or provide access to, regulatory documents. A list of “Frequently Asked Questions” could be compiled and posted. In this way, the regulatory programme’s social media presence will be seen as a source of information rather than an opportunity for debate. Throughout this communication process, the response should be monitored and evaluated so that the approach to social media can be modified, if necessary: just as the media evolve, so can the regulatory approach when using the media.

## **5. EVALUATING THE EFFECTIVENESS OF RISK COMMUNICATION**

As the government begins to implement a risk communication programme to inform the regulation of GM crops, it will quickly come to realise that each attempt at communication is different. Although the reason behind these differences may not be clear, it is recommended that regulators should pause at the end of each decision-making process and evaluate the effectiveness of the risk communication campaign associated with that decision. The goal should be to treat each campaign as an opportunity for continual improvement (American Society for Quality, 2018), that is, to reflect on the success of each communication effort, to identify activities that were somewhat or completely unsuccessful and to implement stepwise improvements in the next communication effort. In doing so, regulators should examine two interdependent aspects of the communication process: (1) the success of the technical aspects of communication; and (2) the success of the process as an expression of the social contract between the government and its stakeholders.

### **5.1. Technical Aspects of the Communication Process**

Much of this review is concerned with the technical aspects of risk communication. It should therefore be straightforward for regulators to create a checklist of points to consider when evaluating past risk communication campaigns. Key issues that should be examined and some suggested evaluation questions are provided in Box 3.

### Box 3. Risk Communication Evaluation

#### Stakeholder identification and interaction

- Is there evidence that certain stakeholders with an interest in the application were not contacted?
- Is there evidence that some of the stakeholders who were contacted did not take an interest in the application?
- Do the regulators need to follow up with some of the stakeholders, to answer questions or provide additional information?

#### Quality of the messages communicated

- Did the stakeholders understand what the applicant was proposing to do with the GM crop?
- Were the environmental and/or human health risks clearly articulated and understood?
- Were the risks effectively expressed in the context of existing risks with which stakeholders were already familiar?
- Did stakeholders understand what feedback, if any, was being solicited?

#### Effectiveness of selected media

- For each type of communication attempted, is there evidence that the selected medium reached the intended audience?
- Which medium delivered the intended message most clearly?
- Was the message delivered in a timely way?
- When feedback was requested, which media generated the greatest amount of feedback?
- Was the feedback received appropriate and useful in the decision-making process?

#### Evaluating the communication campaign

- Did the overall communication campaign acknowledge the right of the stakeholders to be informed of and engaged in the decision-making process?
- Did the campaign provide sufficient and appropriate means for stakeholders to provide input?
- Did the final decision acknowledge the feedback received from stakeholders and incorporate relevant feedback in the decision, as appropriate?

Note that, in many cases, evaluating the technical aspects of the risk communication effort requires obtaining feedback from stakeholders. For example, the government may determine that a simple announcement is appropriate to inform stakeholders that an application regarding a GM crop has been received. It is unlikely that this announcement will generate feedback from stakeholders, thus making it difficult to determine its effectiveness. That is not to say that one-way communications should not be used, but only that these communications are more challenging to evaluate.

## 5.2. Evaluating the Communication Process as a Social Contract

Evaluating the risk communication process as an expression of the social contract that exists between the government and stakeholders can be challenging. Even when the government provides specific questions to stakeholders and clearly articulates the type of feedback that will be relevant and useful to the decision-making process, the feedback from some stakeholders might be outside the scope of the risk assessment

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process. In such situations, the government response may be to acknowledge the feedback but indicate that the risk assessment, risk management plan, and any subsequent decisions, were based on relevant information as defined by the regulations.

Another common outcome when feedback is requested from the general public is that most stakeholders will use the opportunity to “vote” on the use of the GM crop proposed by the applicant. Although such “referenda” are not helpful to the risk assessment process, they do not indicate a failure of the communication process. For each risk assessment regarding the use of a GM crop, the government must continue to provide stakeholders with good information, ask stakeholders clear questions, articulate how the answers to those questions will assist in the completion of the risk assessment, and then review all feedback to identify relevant information. When relevant information is submitted by stakeholders, regulators should consider this an opportunity to further improve the communication process by identifying new stakeholders and fine tuning the phrasing of risk questions.

## 6. CONCLUSION

There is no question that governments should undertake a wide range of risk communication activities, using a variety of media, to exchange information with the general public and special interest groups about the regulation of GM crops. These exchanges should include ongoing, transparent discussions about how the regulations work and how potential environmental and human health risks from these crops are evaluated. Specific risk communication campaigns must also be undertaken in the context of regulatory decisions on individual applications to develop and/or use GM crops. However, this responsibility is a challenging one and stakeholder trust can be fragile. It is important for governments to consider risk communication as an expression of respect for the diverse concerns of stakeholders and carry it out in an objective, fair, consistent and honest manner.

More successful risk communication will be achieved more often if: it is planned well in advance; potentially affected stakeholders are identified at an early stage and included in information exchanges; a variety of media and methods are used to disseminate and collect information; and the success of each communication campaign is evaluated. As pointed out earlier, no government would claim expertise in risk communication but any government can take steps to be better at it.

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