



Perceptions of Non-Europeans on Biotechnology in Europe: Bridging the Knowledge Gap

Isma Moualhi*, Hashini Galhena**, Karim Maredia***,
and Cholani Weebadde****

Abstract: Countries around the world are utilising the new tools of modern biotechnology in their national agricultural research and development programmes to enhance food and nutritional security and foster economic growth. While the ongoing heated debate and controversy on genetically modified organisms (GMOs) in Europe is widely known, this article sets out to understand to what extent the stakeholders globally are aware of the actual involvement of Europe in GM activity. In an attempt to capture the knowledge and perceptions of global stakeholders on the current status of biotechnology in Europe, this study surveyed 107 stakeholders from 43 countries from Asia, Africa, and Latin America. While there is some awareness among global stakeholders on the public acceptance and perception of GMOs in Europe, the survey results indicate that the global stakeholders have limited information and knowledge on R&D programmes, public and private sector engagement, commercial cultivation and management of GMOs in Europe. Bridging this knowledge gap and creating greater awareness among global stakeholders on GMO issues in Europe is critical to reduce the misinformation, misperception and misguided policy implications in the developing world. Not only can countries that are considering the utilisation of GM technology learn from decades of experience, successes and mistakes of Europe and the US, but their awareness of European GM policy is also important in relation to international trade. Evidence-based outreach and educational initiatives can play an important role in bridging this knowledge gap and can also help raise trust and confidence of policymakers to make evidence-based informed decisions on the use of GM technology to benefit society.

Key Words: Europe, biotechnology, GMOs, public perception, stakeholders' voices, outreach and education

1. Introduction

New agricultural technologies play a significant role in addressing the growing challenges of food security and poverty. Developing countries

* International Alumni Officer, University of Groningen, the Netherlands. E-mail: i.moualhi@rug.nl

** Research Assistant Professor, Michigan State University, the USA. E-mail: galhena@msu.edu

*** Professor, Michigan State University, the USA. E-mail: kmaredia@msu.edu

**** Assistant Professor, Michigan State University, the USA. E-mail: weebadde@anr.msu.edu

often have limited access to appropriate technologies to meet the food demands of their rapidly expanding populations. Innovations of modern biotechnology can be useful to enhance agricultural productivity amidst resource limitations and various biotic and abiotic stresses that impact food, fibre and feed production in these countries. In realising the potential benefits of modern biotechnology, a number of countries around the world are currently exploring the possibility of utilising the new tools of genetic engineering, as it enables growing better and more productive crops for food, feed and trade in a changing climate.

Both the United States and Europe have more than two decades of experience with modern biotechnology applications. However, compared to the US, public acceptance and regulation of genetically modified organisms (GMOs) remains a major hurdle in Europe. Political leaders and policy makers are pressured by a sceptic public, often resulting in drawing up regulations that impede the development and utilisation of the GM technology. Moreover, in today's global marketplace, Europe's position on GMOs influences the decisions of other countries that trade with it and have significant stakes in European markets. The European Union (EU), as well as countries in Africa, Asia and Latin America, are signatories to the Cartagena protocol: a framework of rules on trans-boundary movement of GMOs that give signatories the right to decline the import of GMO products on health and environmental grounds. As developing countries are contemplating the introduction of GMOs, trade issues are a great concern. European markets are a major agricultural import region and naturally, exporting countries are concerned that their products could be easily rejected by EU markets if they start growing GM crops (Komen *et al.* 2012).

There is a widespread perception amongst the global masses that Europeans have a negative attitude towards GMOs. However, there is hardly any documented evidence on the actual depth and breadth of global stakeholders' knowledge, the perceptions, the basis for opinions, and the sources of information on the current status of biotechnology in Europe. Drawing from a survey of more than 100 non-European stakeholders with diverse backgrounds from 43 countries, this article attempts to explore the perceptions of non-Europeans on the GM activity in Europe.

2. Survey

This study involved 107 participants from around the world that attended seven international training programmes in various areas of agricultural research and development (R&D) offered through the World Technology Access Programme (WorldTAP) at Michigan State University during the summer of 2013. These training programmes included environmental biosafety, food safety, agricultural biotechnology, agroecology and integrated pest management, sustainable agriculture, molecular plant breeding, and animal agriculture. The international stakeholders surveyed in this study represented 43 countries, majority of which were developing countries in Asia, Africa, and Latin America. All were between the ages of 19 and 60 and the male/female ratio was 60/40. Nearly all participants were associated with professions related to agriculture, whether as research scientists, academic personnel, journalists, regulators, policymakers, government officials, and/or representatives of NGOs and private sector.

The survey was designed with both open and closed-ended questions to measure their basic knowledge of the current status of biotechnology activities in Europe. The surveys were filled out before the commencement of their various training courses such that the course content would not influence their responses. Translation was provided to the participants who did not speak English language.

3. Results

The analysis of survey data reveals that more than 50 per cent of the stakeholders identified themselves as having little information about the status of biotechnology in Europe (Figure 1). About 25 per cent of the stakeholders surveyed believed to be well informed but less than 2 per cent felt that they have a very good grasp on the extent of European policies, regulations, and scientific developments related to biotechnology, specifically on GMOs. Internet and social networks were identified as the most frequently used tools to access information on biotechnology issues. Scientific papers follow these two sources, then newspapers and other media, information from colleagues, and policy documents. A small fraction of the stakeholders stated conferences and regional project reports as alternative sources of information (Figure 2).

Figure 1: How informed do stakeholders consider themselves?

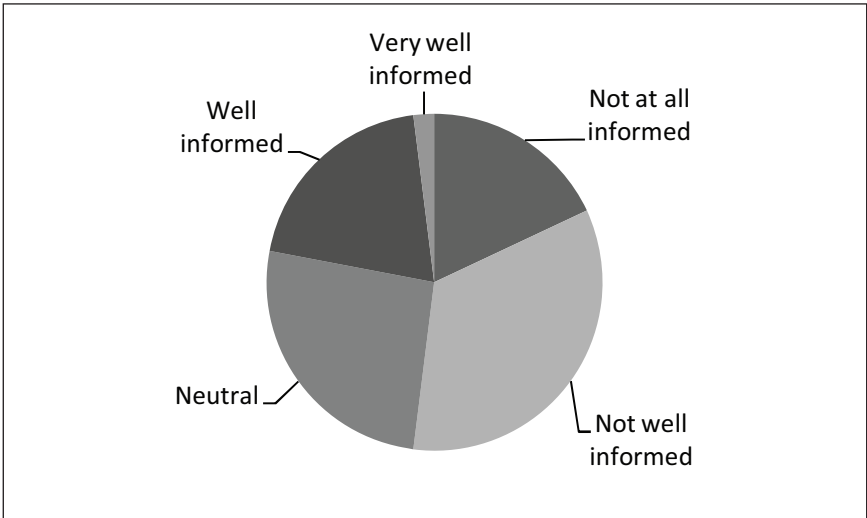
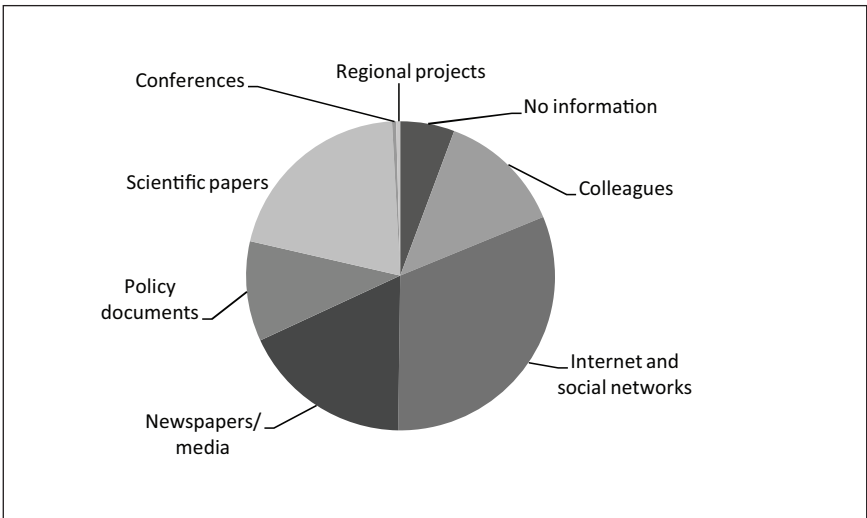
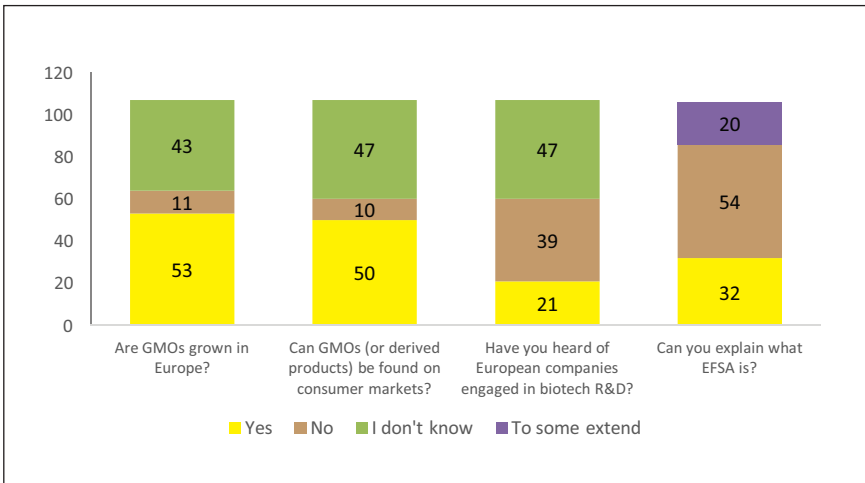


Figure 2: Where do participants get their information?



There is considerable lack of awareness amongst the stakeholders surveyed on the availability and use of biotechnology products in Europe as well as on the existence of a regulatory body and a commercial sector in Europe. For example, about 40 per cent of the stakeholders indicated that they did not know whether or not European countries grow GMO's or conducted research field trials, while 10 per cent wrongly assumed that Europe does not grow genetically engineered crops at all (Figure 3). Although 50 per cent of the participants are aware that GM crops are grown in a few countries in Europe, there is a general lack of clarity and awareness when it comes to specifying these countries (Figure 4). Globally, of the 28 countries that planted GM crops in 2012, five were in Europe. GM maize occupies approximately 0.5 million hectares in Europe with Spain being the leading producer followed by Portugal, the Czech Republic, Slovakia, and Romania (James 2012).

Figure 3: Number of answers to basic knowledge questions about biotechnology in Europe



Spain, Portugal, Germany, France, the UK, and the Netherlands were most commonly mentioned as countries with GM crops. Germany and France grew GM corn only until 2009 and 2008, respectively, after which national bans were imposed (Henard *et al.* 2009). The UK and the Netherlands are not growing GM crops commercially, but were mentioned

by several stakeholders as countries that are growing GM crops. Majority of respondents were not at all aware that Portugal, Romania, Czech Republic, and Slovakia are growing GM corn.

There is a similar knowledge and information gap concerning the consumption of GM food products. Europe is a major importer of GM soybean and GM maize products that provide an important source of protein and feed particularly for livestock (Henard *et al.* 2013). Although all European countries consume GMOs or products derived from them to some extent, the largest importers are Spain, Germany, France, Italy and the Benelux. Despite the fact that information on cultivation and use of GM crops in Europe is readily available through online media and many of the respondents depended on the use of internet and social media for information on biotechnology in Europe, a staggering number of participants (about 70 per cent) did not know in which countries GM food crops are grown and consumed in Europe.

Figure 4: The GMO products (or products derived from GM) that participants believe can be found in consumer markets in these European countries

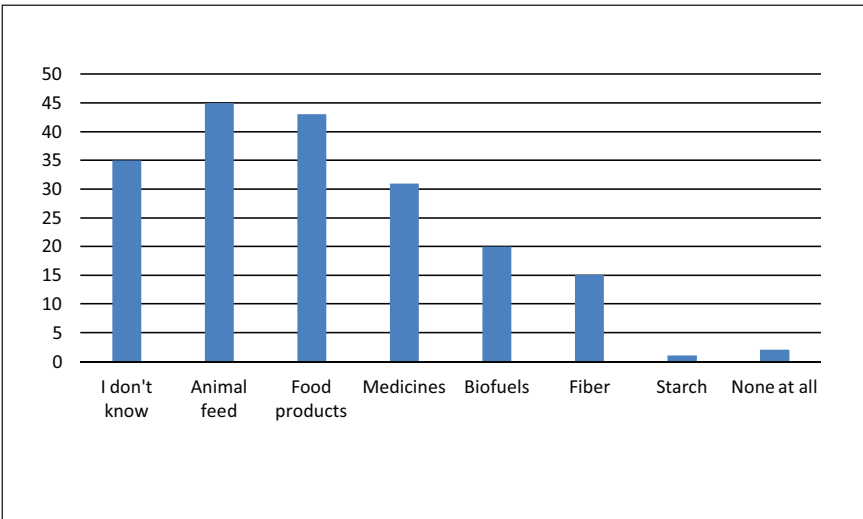
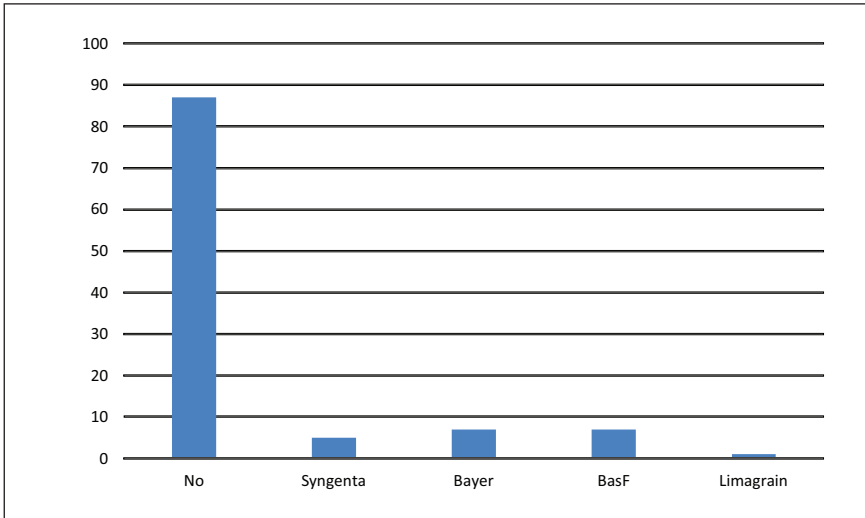


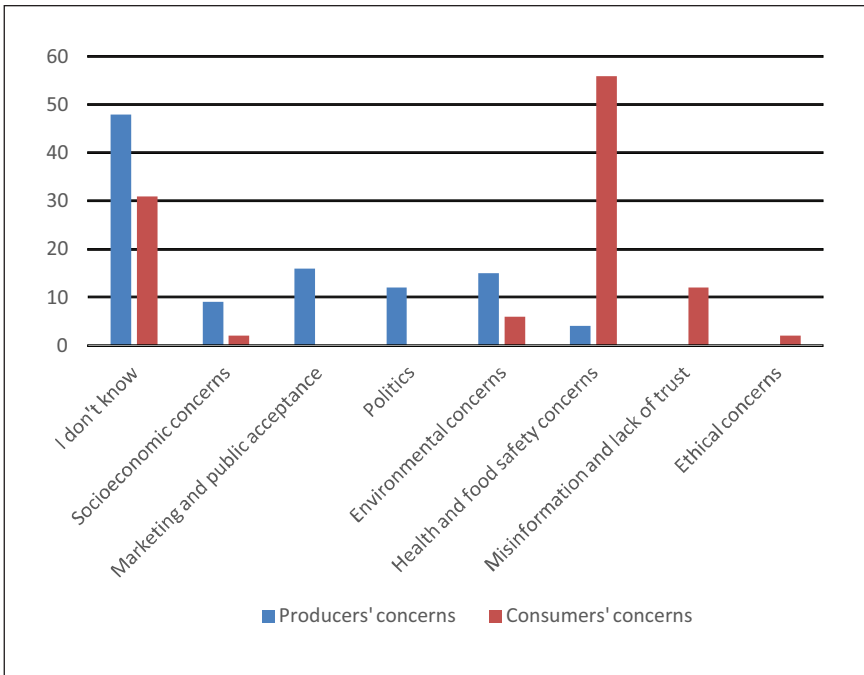
Figure 5: European Agricultural Biotechnology companies known to participants



A number of GM products and their derivatives are found in the European markets. These include products such as sweet corn, soy oil, animal feed, biofuel, feedstock, starch, medicines, and fibre. Approximately 47 per cent of stakeholders surveyed were aware of the fact that products derived through genetic engineering were available in the European market. While the participants rightly pointed out the most common uses of GM products are for animal feed and food products, the diverse uses and availability of GM products in the market place was unknown, thus they were only familiar with one or two products.

With regard to the familiarity with European companies engaged in Biotechnology R&D, over 80 per cent of the participants could not name any such company (Figure 5). The rest named Syngenta, Bayer, BASF and Limagrain as companies that are currently engaged in biotechnology research and development and are operating and conducting business in Europe.

Figure 6: Participants Beliefs on Europeans' Concerns on Biotechnology



Participants were asked to identify the general attitude of European growers and consumers and describe the major concerns they perceive on GMOs in the European context. Although many participants were unsure of the major issues, more than 50 per cent of the participants were able to reflect on important issues and concerns. The biggest concern for producers, as pointed out by the participants, is the challenges of marketing and retaining public acceptance of their products. An important economic concern pointed out for farmers, processors, and retailers of GM products is that their sustenance and competitiveness is largely impacted by their ability to supply to the local demand and retain customer satisfaction. Environmental concerns were also recognised to be of significance along with political factors as well as health and food safety apprehensions.

About a third of the survey participants claimed to have no knowledge on the major concerns of the consumers in Europe related to GMOs. The participant feedback on consumer anxieties as expected was skewed

towards health and food safety concerns. Consumers are sceptical about the impacts of the technology in the long term. These fears are related to another issue pointed out by the respondents, misinformation and lack of trust in national regulatory systems. Indeed, polls carried out by national institutes and agencies in the EU member states indicate that there is general distrust amongst the European community on national regulatory systems and the public needs more information (Henard *et al.* 2013) particularly on the impacts of GMOs and their products on human and animal health and the environment. Other opinions on consumer level concerns included environmental, socio-economic, and ethical considerations.

4. Conclusion

The results indicate that there are great knowledge and information gaps on the current status of GMOs in Europe among the non-European stakeholders. It was not surprising that the stakeholders had more awareness of concerns, worries and fears of producers and consumers in Europe than about the actual biotechnology activities on the continent, as most people access information through the media and “Internet” sources according to the analysis. As Narrovo *et al.* (2013) describe, the media often cannot translate the complex issues related to biotechnology and either chooses not to report news on the matter or “sensationalise due to lack of understanding”. Not having the evidence-based factual information, but being more aware of the emotional reasoning and concerns in Europe, could easily turn into a skewed perception of this rapidly evolving technology. As the 2013 World Food Prize laureate from Europe, Montagu said: the shortage of information is the biggest threat to biotechnology (Vida Rural Magazine 2013).

There is a clear and urgent need to educate and sensitise stakeholders globally on this topic through independent scientific research, education, training and capacity building programmes offered through unbiased stakeholders. Michigan State University¹, the University of Groningen² as well as Ghent University³, for example, have organised training and capacity building programmes, to provide information on various aspects of biotechnology in Europe to explain the science behind the GM technology and present case studies on the application of biotechnology from around the world. These programmes are encouraging dialogue among regulators, scientists, policymakers, academic staff, journalists and other stakeholders

that are dealing with biotechnology issues. It is important that countries considering the utilisation of GM technology learn from the successes and mistakes of Europe and the US through an open, independent and scientific dialogue. Stakeholders should not be deprived of new science and technology because of lack of information and knowledge gaps. More cooperation and collaboration is needed among institutions and programmes globally to bridge the knowledge and information gap on biotechnology.

Endnotes

- ¹ World Technology Access Programme at Michigan State University, the USA.
- ² Science, Technology and Innovation Network Groningen for Sustainability at the University of Groningen, The Netherlands.
- ³ Institute of Plant Biotechnology Outreach at Ghent University, Belgium.

References

- Henard, M.C., D. Achilles, B. Williams, R. Krautgartner and the group of FAS biotech specialists in the EU, E.B.Berry, Jr. R. Richey. 2009. Agricultural Biotechnology Annual. Global Agricultural Information Network Report (Gain Report). Published by the USDA Foreign Agricultural Service. Available online: [http://gain.fas.usda.gov/Recent GAIN Publications/AGRICULTURAL BIOTECHNOLOGY ANNUAL_Brussels USEU_EU-27_7-17-2009.pdf](http://gain.fas.usda.gov/Recent%20GAIN%20Publications/AGRICULTURAL%20BIOTECHNOLOGY%20ANNUAL_Brussels%20USEU_EU-27_7-17-2009.pdf)
- James, C. 2012. "Global Status of Commercialized Biotech/GM Crops: 2012". *ISAAA Brief No. 44*. ISAAA: Ithaca, NY.
- Komen, J. 2012. "Trade and Tribulations: What are the Implications of GMO Cultivation in East Africa?" Article on CSIS blog. Center for Strategic and International Studies. Available at: <http://csis.org/blog/trade-and-tribulations-what-are-implications-gmo-cultivation-east-africa>
- Navarro, M., K. Tome, and K. Gimutao. 2013. "From Monologue to Stakeholder Engagement: The Evolution of Biotech Communication." *ISAAA Brief No. 45*, The International Service for the Acquisition of Agri-biotech Applications (ISAAA).