POLICY BRIEF

We Can Be Friends:
Harvesting the Benefits of Coexistence Farming

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Policy Recommendations

- Philippine agriculture faces increasingly complex challenges brought about by a rapidly growing population, limited production resources, the adverse effects of climate change, and dwindling human resources engaged in agriculture. There is an urgent need to maximize technology utilization to modernize and make Philippine agriculture more productive and competitive.
- Coexistence farming offers a compatible win-win solution. However, more studies are needed, particularly in the Philippine setting, to investigate the economic, social, and environmental implications of using the coexistence model. Technical and procedural guidelines adapted to the local setting must also be set in place to help farming communities implement the coexistence model.
- There is the continuous need to improve access of smallholder farmers and consumers with credible, unbiased, up-to-date, science-based information on agricultural innovations. This will empower them to make informed decisions to freely adopt and optimize a safe, reliable, profitable, and sustainable production system that maximizes farm productivity and farmer income while ensuring the health of both people and the planet.

Background

Transforming Philippine agriculture remains an urgent need, not just because it is intrinsically connected to food security, but also for poverty reduction. The technologies brought by the Green Revolution in the 1960s sparked growth in the sector, but it has remained slow compared to some of its neighboring countries. Although the total productivity of the Philippines has not been stagnant, as evidenced by about 32% increase over the past two decades, it falls in comparison to that of Vietnam (73%), Thailand (67%), and Indonesia (50%) (World Bank 2020).

Throughout the years, the government has established policies to support innovative developments for food and agriculture. In 1990, the Philippines gained the distinction of having the first biosafety regulatory system among developing countries through Executive Order No. 430 by President Corazon C. Aquino (DOST-NCBP 1990). The current biotechnology regulatory system is consistent with the National Biosafety Framework and the principles of the Cartagena Protocol on Biosafety. It is governed by five departments: science and technology (DOST), agriculture (DA), environment and natural resources (DENR), health (DOH), and the interior and local government (DILG) through Joint Department Circular (JDC) No. 1, Series of 2021. This sets out the rules and regulations for the research and development, handling and use, transboundary movement, release into the environment, and management of genetically modified plants and plant products derived from modern biotechnology.

In 2002, the Philippines was also the first in Asia to approve a genetically modified food crop for commercial propagation, Bt corn. In 2019, the International Service for the Acquisition of Agri-biotech Applications (ISAAA) reported more than 470,500 Filipino farmers and their families benefiting from planting biotech corn in more than 630,000 hectares of farmlands. Studies have estimated farm-level economic benefit at USD 724 million in 2016. This also led to a net additional benefit of USD 180 per hectare plus savings on insecticide costs estimated at USD 3 per hectare. The Philippines has also approved the commercialization of two products of genetic engineering -- Golden Rice in 2021 and Bt Eggplant in 2022.

On the other hand, the government has also institutionalized programs geared toward organic agriculture. More than two decades ago, the Philippines enacted Republic Act (RA) 10068 or the Organic Agriculture Act of 2010, which "promotes, propagates, and develops further the implementation of a comprehensive program for community-based organic agriculture." This also defines organic agriculture as a "production system that promotes the ecologically sound, socially acceptable, economically viable and technically feasible production of food and fibers." It also reduces external inputs by refraining from using chemical fertilizers, pesticides, and pharmaceuticals. Although it includes the use of biotechnology and other cultural practices that enhance productivity without destroying the soil and harming farmers, consumers, and the environment, as defined by the International Federation of Organic Agricultural Movement (IFOAM), it does not include genetically modified organisms (GMOs).

According to National Scientist Dr. Emil Q. Javier, there are three substantive differences between organic and conventional farming. These are the prohibition of chemical fertilizers, synthetic pesticides, and the use of products of genetic engineering in organic agriculture. Still, Dr. Javier pointed out that even with these differences, both farming systems have a shared purpose of improving the quality of human life and the environment and can therefore coexist. For instance, he suggested that there should be a balanced mix of organic and chemical fertilizers. While chemical fertilizers help replenish major nutrients necessary for a crop's optimal growth, organic fertilizers provide organic matter, which improves soil structure for better aeration and drainage, as well as beneficial soil microorganisms and trace elements. (PCAARRD Forum Proceedings: Organic and Inorganic Farming 2021).

The Organic Agriculture Act of 2010 also established the National Organic Agricultural Board (NOAB), a policy-making body that directs the implementation of the National Organic Agricultural Program. The NOAB comprises the secretaries or duly authorized permanent representatives from the DA, DILG, DOST, DENR, DOH, and the Department of Trade and Industry (DTI). It also includes representatives from small farmers, NGOs, agricultural colleges, and universities, and the private sector or agribusiness firms (Congress of the Philippines 2009).

Since its legislation, the popularity of organic agriculture has increased and has become one of the key programs of recent past administrations through the Department of Agriculture. However, despite strong support and funding from the government and the passionate championing by different NGOs, widespread adoption of organic farming has been slow. Its initial impacts are less convincing (PCAARRD Forum Proceedings: Organic and Inorganic Farming 2021). It has also hindered farmer choice, thus limiting potential income (Gonzalvo et al. 2021).

Discussion

Thinking that only one single production model can work at a time is a thing of the past. Different agricultural systems can coexist and contribute to sustainable food production. Such is the case in Chile where genetically modified seed production and organic farming thrive since the country implemented a rigid, voluntarily self-imposed coexistence mechanism in 1999.

While GM seed producers mainly grow maize, soybean, or canola, organic farmers grow fruits and vegetables. This strategy has allowed both industries to effectively and successfully coexist since it minimizes the chance of cross-fertilization between GMOs and organic crops due to pollen flow. The national seed trade association operate and supervise a Global Positioning System (GPS)-based software that precisely notes farm positions and allows farmers to identify the radius where outcrosses might happen. An isolation handbook has also been developed to help identify the minimum isolation distances and registration deadlines for seed-producing farms.

With over three decades of experience in GM seed production, Chile has become one of the major players in the development of GM crops and a leading exporter of GM seeds. During the 2017/2018 cropping season, GM maize accounted for 72 percent of the whole maize seed production while 100 percent of the soybean produced in the country was GM. In the 2019/2020 season, GM canola seeds accounted for 85 percent of all canola seed production. Their seed industry, which caters exclusively to export markets, has generated USD 68-93 million between the 2015/2016 and 2019/2020 planting seasons.

Meanwhile, organic exports from Chile have also been in demand, reaching more than 50 countries. In 2019, Chile's Ministry of Agriculture agency reported 20,987 hectares of certified organic farmlands. Similarly, the country's certified organic production is intended for export markets. In 2019, 2.7 percent or 86,948 tons of agricultural exports amounting to USD 274 million was organic produce.

It is worth noting that Chile's coexistence strategy prospers in the absence of a clear regulatory framework addressing this topic. The experience of Chile has not only proven the feasibility of coexistence farming but has also provided farmers with alternative production options. This is not seen to have a deleterious effect on their organic agriculture industry as there have been no cases of agronomic or economic impacts reported and confirmed to date (Sanchez and Campos 2021).

A 2006 study in Spain found that cross-fertilization between Bt and conventional maize was determined by synchronicity of flowering time and the distances between the donor and receptor fields. In this study, a map was designed to identify where Bt maize or a conventional maize is grown including their sowing and flowering dates. It found out that 9 out of 12 non-transgenic fields had GM DNA values that are much lower than 0.9%. In addition, the study also suggests that a 20-meter distance is sufficient to control adventitious presence of GM DNA and keep it below the 0.9% threshold. It further suggests that rules of coexistence farming must consider synchronicity of flowering and the distance between fields (Messeguer et al. 2006).

While regulations for coexistence in the country have not been firmly established, Spain remains the largest producer of GE maize with more than 98 hectares of farmland dedicated to the biotech crop in 2020. This demonstrates that Spanish farmers have managed to grow GE maize alongside organic maize without issue. They adhere to good agricultural practices set by the National Association of Seed Breeders which are published annually (USDA-FAS 2020).

Concerns

There are concerns regarding products of modern biotechnology in coexistence agriculture. Gene flow, or the spread of genetic materials across plant populations, may reach organic crops causing them to be contaminated and lose their status as organic products. This can potentially lead to economic losses (Kiefer 2012). However, the experience of Chile and Spain both illustrate that coexistence farming is not a problem if guidelines are carefully set and followed by neighboring farmers. Environmental and health risks should also not be an issue if the crops grown using this model, including modern biotechnology products, have been approved as safe for both people and the planet by the country where it is grown (CropLife International 2023).

Various global and national institutions — including the World Health Organization, the European Commission, The Royal Society (United Kingdom), the American Association for the Advancement of Science, and other national science academies — have declared that genetically edited products are safe. Products of modern biotechnology have been planted on more than 191 million hectares all over the globe since 1996, and there is no proven instance of negative effects from such products (PCAARRD Forum Proceedings: Organic and Inorganic Farming 2021).

Farmers' perspective

It is important for farmers to be heard and take part in the discussions that determine agricultural policies in general. Recent data suggest that organic and biotech farmers are open to adopting the coexistence model guided by science. A 2021 study reported that almost 90% of Filipino organic farmers surveyed showed a positive view of coexistence. Several testimonies by organic farmers indicate their belief in coexistence. They say that since the biotech crop is already good, using it in organic farming will further improve their production. According to the same study, organic farmers are aware that their farm productivity is lower compared to biotech farmers. Their interest in using biotech crops in organic farming comes from yield stability and pest and disease resistance. One testimonial said, "Since I want my crops to have a good yield, I think biotech crops are worth trying" (Gonzalvo et al. 2021).

Conclusions and Future Directions

Philippine agriculture must no longer be business as usual. The increasingly complex challenges faced by the sector necessitate innovative ways of doing things to maximize farm productivity. One way of doing this is exploring different production models like coexistence farming that can offer a compatible win-win solution.

Simultaneously cultivating crops with different quality characteristics, including those derived from modern biotechnology, is not new. Farmers have adopted such practices to respond to the demand while gaining economic benefits. More studies are needed, particularly in the Philippines, to identify the coexistence model's economic, social, and environmental implications. In addition, technical and procedural guidelines must be prepared to enable farmers and farming communities to use the coexistence model. Such initiatives in the field of research and policy must be complemented with a comprehensive knowledge-sharing program for both farmers and consumers. They need ready access to credible, unbiased, science-based information on agricultural innovations to make informed decisions and freely choose a safe, reliable, profitable, and sustainable production system for maximum farm productivity and income while ensuring the health and safety of both people and the planet.

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