

学位論文の要旨 (論文の内容の要旨)
Summary of the Dissertation (Summary of Dissertation Contents)

氏 名

Name

CLARISSE MENDOZA GONZALVO Seal

学 位 論 文

Dissertation

論 文 題 目

Dissertation Title

Farmer Decision-Making on the Concept of Coexistence: A Comparative Analysis Between Organic and Biotech Farmers in the Philippines

Organic and biotech farming are two of the most well-known and well-advocated farming methods around the world; however, despite their proven benefits, each method is still viewed as a separate production system, and both are perceived as dichotomizing issues for many years. In the Philippines, both farming methods are immensely supported, yet strongly pitted unnecessarily against each other. Several studies have reported that combining the two methods can produce important synergies that are needed to sustainably attain food security and mitigate climate change for the coming decades. When combined, modern agricultural biotechnology (e.g., production of enhanced seeds that are pest- or drought-resistant, or biofortified crops that are more nutritious to eat) and ecologically based farming practices in organic farming can help address Sustainable Development Goals 2 (Zero Hunger), 13 (Climate Action), and 15 (Life on Land).

This thesis assessed farmer perspectives regarding the concept of coexistence through a cross-sectional survey of 70 Filipino farmers (i.e., 35 organic and 35 biotech). The results showed that for both farmer groups, a non-linear decision-making process was present, which aligns with the assumption of the Stimulus-Organism-Response Model. Furthermore, biotech farmers were more prone to be related to internal farming decision variables (e.g., consumer resources), while organic farmers tend to be more related to external farming decision variables (e.g., culture and social interactions) in connection to their coexistence perspective. In the organic farming group, the presence of “maverick executives” or people who are not afraid to break the status quo indicates that coexistence can help empower farmers in choosing what farming method/s would be most suitable to their needs. The data from this study can provide insights for policymakers to balance farmer needs (mostly in yield and income security) and the national agricultural agenda focusing on environmental conservation.

While the Philippines has been increasing its support of biotech crops, such as the recent approval of Golden Rice and *Bt (Bacillus thuringiensis)* eggplant for cultivation, the acceptance of biotech crops have not been as lenient for the years prior to 2020. Hence, this thesis also analyzed farmer perspectives on the 2015 biotech ban that happened in the Philippines, since this aspect is relevant in determining the feasibility of the concept of coexistence in the country. A cross-sectional survey was conducted in Pampanga, Philippines to interview 111 biotech corn farmers. The results showed a bifurcation in the farmers’ ban perception, with almost half saying that its implementation was an incorrect decision. The relationships of decision-making stages and farming decision variables on the biotech corn farmers’ perceived correctness of the ban were modeled using ordinal logistic regression and Spearman correlation. The results showed that while the farmers’ initial instinct is directly related to their ban perception, subsequent decision-making stages indicate a more pragmatic point of view leading to innate resistance towards the ban. In terms of farming decision variables that have a relationship with their desire to continue their biotech corn adoption, four emerged to be significant, with *satisfaction in planting biotech corn* being the first in rank. Based on the odds ratio estimate, the farmers were 180% more likely to continue planting biotech corn despite the ban due to this variable. This was followed by *knowledge about the ban on planting biotech corn and Bt eggplant*, *knowledge about biotech corn*, and *personal experiences in planting biotech corn*, which all have a positive relationship with their likelihood to continue biotech corn adoption. The correspondence analysis also showed that farmers who perceived the ban as incorrect would continue their adoption, while those who

perceived the ban as correct were unsure whether they would continue their adoption or not. The cost-benefit analysis highlighted the economic, social, and environmental benefits of biotech corn adoption, and showed that non-adoption (caused by the ban) does not align with the goals of sustainable agriculture.

The findings of this thesis show the importance of taking farmer perspectives into consideration when implementing agricultural policies, most especially restrictive ones, to avoid conflicting interests between policymakers and stakeholders. Furthermore, this thesis highlighted the importance of balancing the three pillars of sustainability when developing a new approach to agriculture. As much as possible, it should be economically beneficial to farmers (in the form of sustained yields and income), environmentally friendly (uses fewer chemical pesticides and fertilizers), and socially beneficial to and supported by producers and consumers. Coexistence has the potential to bring forward these three important aspects of sustainable agriculture, so more studies should be conducted regarding its feasibility.

Keywords: coexistence, organic farming, biotech farming, farmer decision-making, sustainable agriculture

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