UNIVERSITY OF GUAM
COOPERATIVE EXTENSION
& OUTREACH

Cooperative Extension & Outreach
Technical Report
TR 17-22

Head Start to Agriculture on Guam
Focus Group Studies on Challenges and Opportunities Ahead

Kuan-Ju Chen, Ph.D., Jesse P. Bamba, Mary Catherine Wiley and Laarnie Vinca.
Cooperative Extension & Outreach, College of Natural & Applied Sciences,
University of Guam

Introduction

Agricultural producers have been facing common challenges such as climate change, rising prices for commodities, infectious diseases, and more recently, the COVID-19 outbreak. In the United States (U.S.), the central issue is developing more environmentally sustainable food production and handling methods (Hanson et al., 2008). Likewise, the agricultural community in the Western Pacific Region is developing a more sustainable and resilient food production system.

Background

Guam's total import of food and non-alcoholic (alcoholic) beverages plummeted by 43% (38%) from $10.1 million ($2.8 million) in 2018 to $17.6 million ($1.8 million) in 2019. In the 5 years from March 2017 to March 2021, Guam recorded a peak for total export of food and non-alcoholic beverages of $2.0 million in March 2018 (**Figure 1**). Since then, there has been a decline in the total exports of food and non-alcoholic beverages, which was especially pronounced during the COVID-19 outbreak, with export values falling by 61.94% from $703,008 to $267,542 from March 2020 to March 2021.

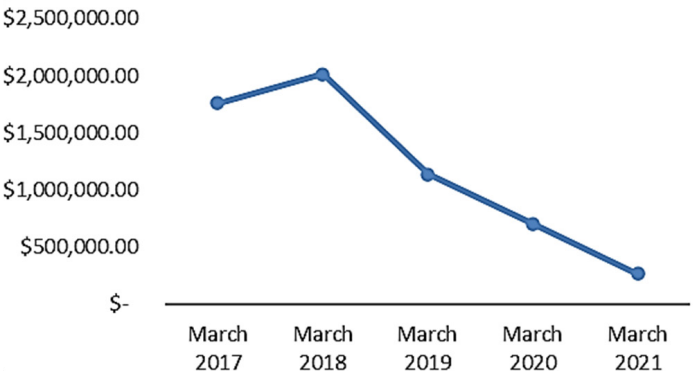

Figure 1: Guam Export of Food and Non-Alcoholic Beverages 5-Year Period.
Source: The Bureau of Statistics and Plans: Guam Export Data.

The impact of COVID-19 was widespread on local businesses and the agricultural industry. Lockdowns, social distancing, and quarantine have destabilized the economic situation, with rising commodity prices and a shortage of food supply. To cope with the reduction in consumer spending, digital agriculture, such as promoting and transacting agricultural produces online, has emerged to overcome the closure of traditional farmer markets. According to the Food and Agriculture Organization (FAO) of the United Nations, Director QU Dongyu stated that digital agriculture could reshape the food systems towards alleviating hunger and poverty, developing a more prosperous future (Food and Agriculture Organization of the United Nations, 2021). In this regard, the University of Guam Cooperative Extension and Outreach (CE&O) has organized a focus group study on June 19, 2021, to seek ways to help our local farmers.

Survey Methodology and Participation

A focus group study surveyed information on a participant's unbiased perspective on the challenges and opportunities they face in Guam's agricultural industry. Survey questions varied from soliciting information on their individual opinions of the importance of COVID-19 factors affecting production, factors of input and practices for fields and environmentally sustainable factors, and other significant challenges. It also included questions on environmentally sustainable production, their knowledge about sustainable production, and their interest in learning about marketing strategies for production. Eighteen (18) participants attended this study, comprised of commercial, subsistence, and non-governmental organization (NGO) farmers.

A mixed-method approach used in this study consisted of three phases: (1) individual surveys, (2) small focus group sessions, and (3) individual voting on the top aggregated challenges and potential developmental programs deemed

to be most critical. The study was designed to cover a greater scope of the main adversities faced by our local farmers and farmworkers. The three phases of the focus group study are as follows:

- Phase 1: Participants complete individual surveys with their unbiased input on the challenges they continue to experience in their agricultural production.

- Phase 2: Placed into three groups, participants engaged in small group discussions led by moderators and recorders. In this phase, participants were allowed to communicate and collaborate to identify the top concerns/ issues in their agricultural operations and three potential developmental programs that will help the agricultural industry in Guam. After the discussion, participants of each group were given five stickers to vote on the main issues they listed and another five stickers for the developmental programs listed. Each person was limited to three votes per issue or developmental program option.

- Phase 3: The responses from phase two from all groups were aggregated and added to a community board. Each participant was given five stickers to vote on what they identified as most critical and five stickers to vote on the top potential developmental program option. Similar to phase two, each person was limited to three votes per issue or developmental program option.

Demographic Characteristics

Gender

Based on the March 2021 Current Employment Report, population estimates provide there are 250 male (83%) and 50 female (17%) agricultural producers in Guam (Hiles, 2021). In this focus group study, fifty percent (50%) of the participants were male, while 44.44% were female. (**Figure 2**). There were more female participants in this focus group study compared to 2019, which was composed of only 13% female (Western Pacific Tropical Research Center, 2020).

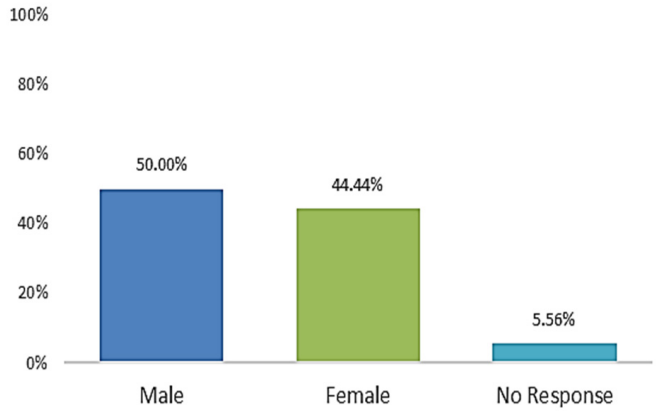

Figure 2: Percentage of respondents by gender.

Year of Birth

Seventeen (17) out of 18 survey participants responded to the year they were born (**Figure 3**). The respondents were born between 1948 and 1997. The majority of the participants were born between 1948 to 1957 (27.78%) and 1978 to 1987 (27.78%), which places them in the 30 to 39 and 60 to 69 age group. The median age of the participants is 51, which is close to the median age of 55 in 2019 (Western Pacific Tropical Research Center, 2020).

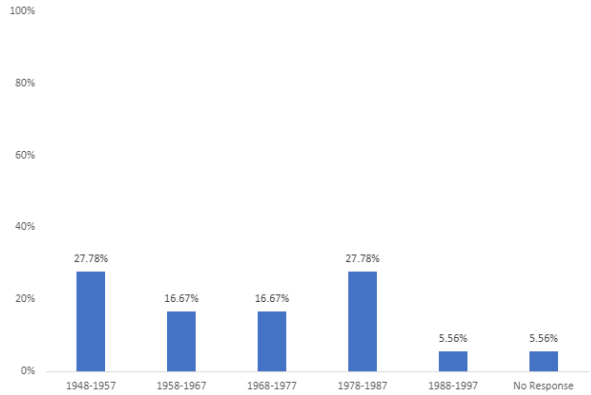

Figure 3: Percentage by Year of Birth.

Ethnicity

Out of the 18 survey participants, 11.11% did not respond (**Figure 4**). Half of the participants (50%) identified as CHamoru, which is slightly similar to the focus group participants in 2019 at 53% (Western Pacific Tropical Research Center, 2020). In this focus group study, 22.22% of the participants identified as Filipino, whose value increased from 13% in 2019. In addition, 11.11% identified as Chinese compared to 20% (Western Pacific Tropical Research Center, 2020) in 2019. About 5.56% identified as Taiwanese.

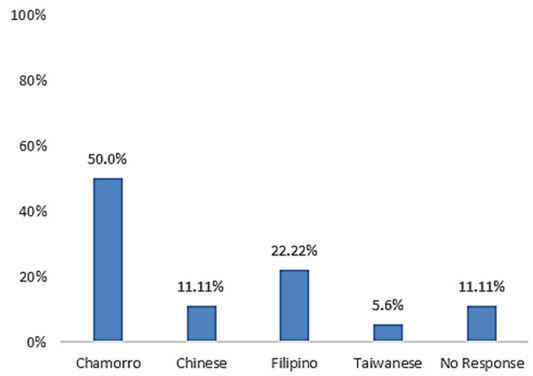

Figure 4: Percentage of respondents by ethnicity.

Gross Revenue

The survey participants generated a gross on-farm revenue between less than $5,000 and more than $150,000 (**Figure 5**). Out of 18 participants, 5.56% indicated that generating revenue was not applicable, and 11.11% did not provide a response. About 28% of the participants generated gross on-farm revenue of less than $5,000 compared to 2019, where 27% produced between $5,000 to $34,999 (Western Pacific Tropical Research Center, 2020).

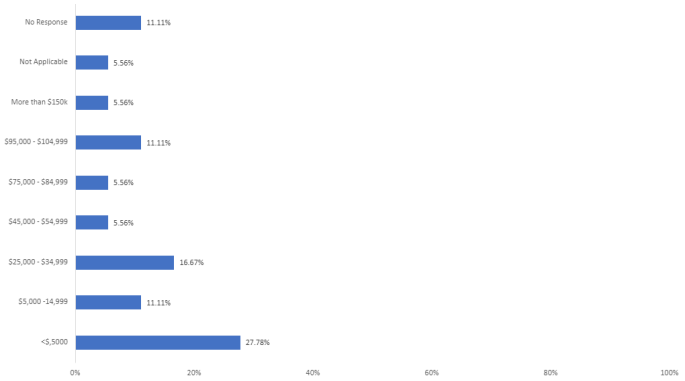

Figure 5: Percentage of gross on-farm revenue.

Business

Figure 6 shows that most participants are commercial (33.33%) or subsistence farmers (33.33%). About 5.56% have indicated that they are commercial and subsistence farmers, while 27.78% are NGOs (Farmers' Co-op, Guåhan Sustainable Culture, Farm to Table, Soil and Water Conservation Districts).

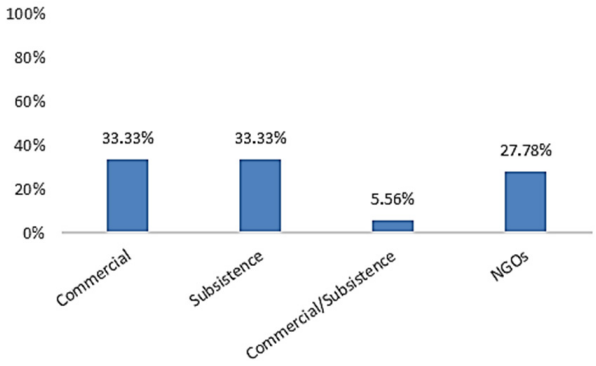

Figure 6: Percentage of Participants by Business.

Number of Years Farming

More than 50% of the participants have been farming for between 1 to 10 years (**Figure 7**). About 22.22% of the respondents have between 11 to 30 years of experience in farming. Approximately 16.67% of the participants have been farming for more than 30 years, compared to 20% in 2019.

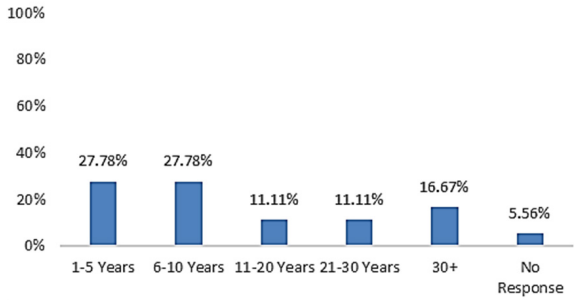

Figure 7: Percentage by number of years farming.

Factors Affecting the Agricultural Industry

Very and Extremely Important COVID-19 Factors Affecting Production Combined

Survey participants rated the level of importance of COVID-19 factors affecting agricultural production through a five-point Likert scale which ranged from "Not at all important" to Extremely important." **Figure 8** reveals the critical factors rated "Very important" and "Extremely important" combined. Responses indicate that the top three factors include financial support (66.67%), labor (55.56%), and marketing (50%), which corresponds to prior findings in the 2019 focus group study (Western Pacific Tropical Research Center, 2020). Technology and equipment had the lowest level of importance regarding COVID-19 factors affecting production.

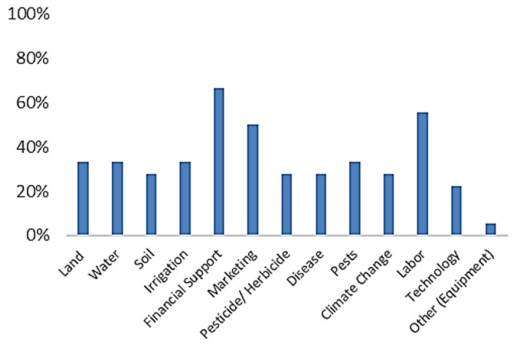

Figure 8: Percentage of Important COVID-19 Factors affecting Production.

Very and Extremely Important Factors of Input and Practices for Fields

Survey participants rated the importance of factors of input and practices for fields. Factors include economic profit, environmental stewardship, quality of life, cropland productivity. Responses were measured using a five-point Likert scale (from 1 = Not at all important to 5 = Extremely important). **Figure 9** reveals the combination of "Very important" and "Extremely important" ratings for each factor. Economic profit, environmental stewardship, and quality of life have been rated equally at a high level of importance (83.33%) compared to an equal rating of "Extremely important" at 54% in 2019 (Western Pacific Tropical Research Center, 2020). About 78% of the participants found cropland productivity to be important, close to the value in 2019.

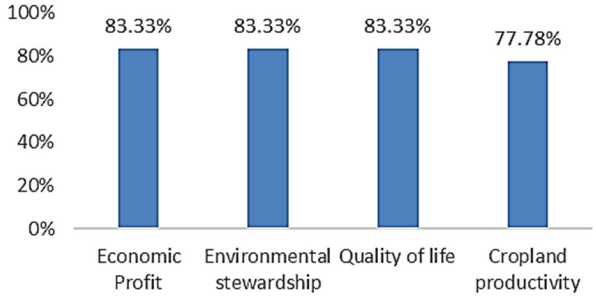

Figure 9: Percentage of Important Factors of Input and Practices for Fields.

Importance of Environmentally Sustainable Production Factors

Survey participants were also asked to rate the level of importance when it comes to environmentally sustainable production factors. A five-point Likert scale (from 1 = Not at all important to 5 = Extremely important) was used to measure the responses. **Figure 10** reveals the combination of "Very important" and "Extremely important" ratings for each factor. Survey responses reveal that food security (83.33%) has the highest level of importance when it comes to environmentally sustainable production, followed by soil health, production cost, and water pollution.

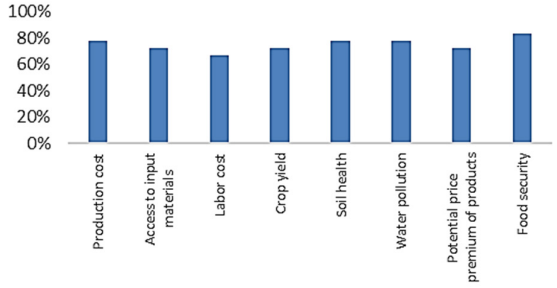

Figure 10: Importance of Environmentally Sustainable Production Factors.

Implementation of Environmentally Sustainable Method and Knowledge

Survey participants were asked the likelihood of them implementing an environmentally sustainable method in their production that can help reduce the environmental impacts of conventional methods (**Figure 11**). Their responses were measured using a five-point Likert scale (from 1 = Not at all likely to 5 = Extremely likely). About 56% of the participants indicated that they are "Extremely likely" to implement environmentally sustainable methods compared to 43% in 2019 (Western Pacific Tropical Research Center, 2020). Their knowledge on sustainable production was measured through a 4-point Likert scale (from 1 = None to 4 = Above average). About 22.22% of the respondents rated their knowledge of sustainable methods as "above average", while 50% had average knowledge on sustainable production (**Figure 12**).

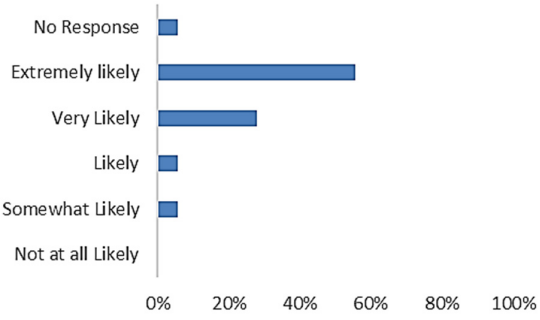

Figure 11: Percentage of likelihood to implement environmentally sustainable method.

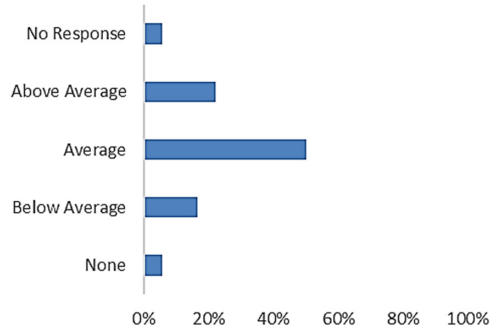

Figure 12: Percentage of Knowledge on Sustainable Production.

Interest in Learning About Marketing Strategies

Survey participants were asked to rate their interest in learning more about marketing strategies for their products. Responses were measured through a five-point Likert scale. Over 50% of the surveyed participants indicated that they are "Extremely interested" in learning about marketing strategies for their agricultural business (**Figure 13**).

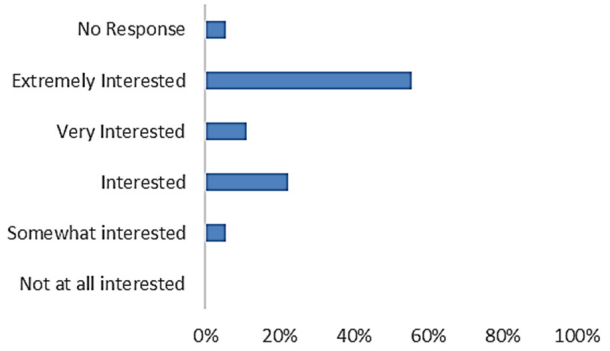

Figure 13: Percentage of Interest in Learning about Marketing.

Top Three Critical Issues and Potential Developmental Programs

In phase three of the focus group study, responses from each of the three groups from phase two were aggregated. The top issues included pest control, infrastructure (installations, fees, meter, road, plumbing, licensing fees, irrigation, etc.), marketing (poultry & livestock, selling eggs, slaughterhouse, supply chain, market price, import, and export, etc.), and sustainable practices. The results of the participants' sticker votes revealed that the top three issues they face include challenges relative to infrastructure, marketing, and sustainable practices. Possible program insight from the aggregated responses suggests better developmental programs for agricultural education (training programs, internships, Future Farming Group, Future Farmers of America, etc.) and a one-stop shop that would most effectively improve local agricultural production.

Discussion

In summary, this study identifies the challenges and opportunities our agricultural producers face in Guam, shedding light on these issues and developing solutions for a more sustainable and resilient local food supply chain. From **Figure 8**, the top factor affecting local agricultural production is financial support, followed by labor and marketing. The unstable economic situation that emerged from the COVID-19 outbreak has heightened financial challenges such as a shortfall in farmers' income due to reduced spending and the closure of businesses that caused locally grown cucumbers and eggplants to rot on the field (Tomas, Guam Daily Post, 2020, April 26).

Guam's population in 2020 was estimated to have about 169,000 inhabitants (United Nations, Department of Economics and Social Affairs, 2019), with a small percentage of agricultural producers. As of March 2021, employment statistics reveal that there are only about 300 employees in the agricultural sector in Guam, representing 0.5% of the total employees on payroll (Hiles, 2021).

Marketing was also one of the top critical factors affecting agricultural production in Guam. The majority of the survey participants indicated that they are interested in learning about marketing strategies. This offers an opportunity for the local agriculture businesses in Guam to expand and drive-up consumer demand by developing a digital marketplace to better support our agricultural communities in navigating the post-COVID-19 digital era. According to Anshari et al. (2019), a digital marketplace is necessary for agricultural businesses to meet consumer demands for quality products with competitive prices from various geographical locations. While the COVID-19 outbreak shifted consumer demand for digital channels, online platforms are versatile and convenient in enabling businesses to advertise and perform digital transactions while reaching a larger audience. As the Director of FOA in the United Nations stated, "Digitalization is the way of the new life and new economy (Food and Agricultural Organization of the United Nations, 2021, para. 2)."

The survey also asked participants of their input on the importance of factors of input and practices for their fields. Based on the results of the combined factors of "Very important" and "Extremely important", the top three include economic profit, environmental stewardship, and quality of life. According to Hanson et al. (2008), as the demand for environmental stewardship increases, this will improve agricultural policies and the development of the agricultural market. As indicated, results of phase three of the focus group study showed the participants value agricultural education programs to further develop the local industry and offer a better understanding of the importance of managing natural resources such as land, water, and the waste reduction for our environment.

Results of the focus group study exhibit that there are also opportunities despite challenges. Significantly, local producers have shown resilience in adapting to changes and unexpected events. It is crucial to ensure that local farmers are adequately supported with the resources necessary to cultivate the island's agricultural market through collaborative and effective communication within participating institutions and organizations.

A limitation of the survey results is that perspectives may differ as not all the participants have the same agricultural production experience and knowledge. The participants consist of subsistence farmers, commercial farmers, and NGOs whose farming purposes will differ. In addition, some participants of the focus group study left after phase two and did not participate in phase three.

Acknowledgments

This study is funded by the project, "Promoting Sustainable and Local Food Systems in Guam," which is supported by the USDA National Institute of Food and Agriculture, under award number GUA942-1023561

References

Anshari, M., Almunawar, M. N., Masri, M., & Hamdan, M. (2019). Digital marketplace and FinTech to support agriculture sustainability. *Energy Procedia, 156*, 234-238.

Food and Agricultural Organization of the United Nations. (2021). *"Digitalization is the way of the new life and new economy."* https://www.fao.org/news/story/en/item/1400816/icode/.

Hanson, J.D., Hendrickson, J., & Archer, D. (2008). Challenges for maintaining agricultural systems in the United States. *Renewable Agriculture and Food Systems, 23*(4), 325-334.

Hiles, G. (2021, March). March 2021 Current Employment Report. Bureau of Labor Statistics. Department of Labor. Government of Guam.

The Bureau of Statistics and Plans. (2020). Guam Export Data. External Trade Section March 2020. https://bsp.guam.gov/wp-bsp-content/uploads/2021/04/March-2021-Export.pdf.

The Bureau of Statistics and Plans. (2021). Guam Export Data. External Trade Section. March 2021. https://bsp.guam.gov/wp-bsp-content/uploads/2021/04/March-2021-Export.pdf.

Tomas, J. S. (2020, April 26). Farmers hurting as crops rot; group aims to help. *Guam Pacific Daily News*. Retrieved on June 12, 2021 from https://www.guampdn.com/story/news/local/2020/04/25/coronavirus-guam-farmers-hurting-crops-rot-group-aims-help/5161437002/.

United Nations, Department of Economics and Social Affairs. (2019). *World Population Prospects 2019* (Online Edition. Rev. 1) [Dataset] United Nations, Department of Economic and Social Affairs, Population Division. https://population.un.org/wpp/.

Western Pacific Tropical Research Center. (2020). 2020 Impact Report. College of Natural & Applied Sciences. University of Guam. *https://www.uog.edu/_resources/files/wptrc/2020WPTRCFinal.pdf.*

Published: 22 October 2022