

Enhancing Farmers’ Resiliency through the Farmer’s Learning Center: A Qualitative Impact Assessment of Agricultural Interventions

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ABSTRACT

Most impact assessments are done using a positivist’s approach, but interpretive designs provide rich insights from personal views of project recipients. Hence, a study was conducted to explore the impact of agricultural interventions of a university and their contribution toward farmer’s food security and increased income. This descriptive narrative research employed in-depth interviews among target participants following the guide questions formulated based on research objectives. Thematic analysis was used to bring about emerging codes, categories, and themes by using open, axial, and selective coding. The study generated six themes that serve as pieces of evidence on the impact of the extension project particularly the establishment of the Farmers' Learning Center (FLC), also known as the trial farm cum community seed bank, through *bayanihan*. A total of 23 different crops were grown in 2018 and planting materials were distributed to the farmers. Simultaneously, three indigenous crops namely foxtail millet, adlay and roselle were maintained in the FLC. The participants viewed FLC as a source of knowledge and at the same time they are treated as partners in development. Roselle which emerged as a resilient crop has therapeutic benefits and a potential source of income. The study highlighted the challenges encountered which include lack of market and participants’ limited technical knowledge in processing roselle. Thus, this study urges the university to continue the agricultural intervention to capacitate further the farmers and link them with agencies that offer equipment support to improve roselle processing, handling, packaging and storage.

Keywords: agricultural interventions, on-farm research, roselle, qualitative impact assessment, food security

INTRODUCTION

Knowledge and information can help address global issues like hunger and poverty, but there is frequently a gap between the answers to these issues and the millions of people living in poor and vulnerable rural communities who most need them.

Moreover, the loss of genetic resources and the loss of local knowledge about traditional agricultural practices compromise the ability of farmers and plant breeders to

develop plants that will resist future environmental shocks, including those associated with climate change (Gonzalez, 2011). Stopping climate change is near to impossible but humans can act to be able to become resilient and survive while minimizing its effect in this generation to the next. Climate change has caused severe loss in agricultural production and human lives, requiring the agriculture sector to adapt (International Panel for Climate Change, 2022). According to the Climate Change Commission (2011), the Philippines has prepared a framework of strategies and actions for adaptation and mitigation, including the National Climate Change Action Plan (NCCAP). This plan aims to manage risks, adjust economic activity, reduce vulnerability, and improve certainty in business.

The Central Mindanao University (CMU) in the University Town, Bukidnon, Philippines supports two of the NCCAP's priority areas in its research and extension projects: ensuring food security amidst climate change and developing understanding and capacity to improve climate change knowledge, enhance local community capacity for climate change adaptation, mitigation and disaster risk reduction. Aligned with the UN Sustainable Development Goal 2 on Zero Hunger (SDG2) and Climate Action (SDG 13), CMU collaborated with a farmer's organization (FO) and a non-profit government organization (NGO) to increase farmers' resiliency to climate change.

In 2016, the CMU College of Agriculture (CMU CA) implemented the extension project, “Enhancing Farmers' Resiliency to Climate Change Effects through Community Actions and Adoption of Appropriate Technologies”, that aimed to increase resiliency among farmers. In its 5-year implementation, the project attained significant outputs and outcomes. The farmers utilized *tubog* or fig tree as a biofertilizer source using different ingredients. Then 2020 came. The CoViD-19 phenomenon challenged these initiatives. But on the other hand, it opened doors of opportunities. Re-entry planning was conducted, and the project introduced other crops to be planted in the FLC which included roselle. The farmers found out that roselle is a drought-resistant crop, hence research on product standardization was conducted” (Salingay, 2017). It has so far attained its target outcomes and is yet to determine the project's impact on ensuring that farmers attain food security and increased income.

Impact Assessment (IA) is an approach used to evaluate whether the changes observed in the target beneficiaries can be attributed to the introduced development project (IFAD, Nd). Yet, IA are done quantitatively mostly through cross-sectional surveys. Hence, this study was conducted to qualitatively assess the impact of agricultural intervention. Specifically, it sought to: 1. Understand the impact of the extension project on farmers' food security; and 2. Explore the impact of the extension project on farmers' increased income. With a narrative descriptive approach, the study highlighted the positive impact of the agricultural interventions as well as the need to sustain them to help address the challenges encountered by the farmers.

LITERATURE REVIEW

Embedded in fostering community conversations about farming solutions based on

science and boosting agricultural output amidst unpredictable temperatures and weather patterns is the integral role of extension and development communication. To evaluate whether the changes observed in the target beneficiaries can be attributed to the introduced development project, impact assessments (IA) are done (IFAD, Nd). IA findings are important contributions to informed decision-making and are usually carried out in collaboration with the local stakeholders and government counterparts to ensure relevant results (IFAD, Nd). Impact assessment is used to identify the level of technology adoption and the extent of its impacts and benefits.

IA also identifies the “characteristics of adoptors, reasons for adoption, constraints, and factors influencing adoption” to improve the technology as well as the adoption pathways (Gabunada, 2013). IA plays a vital role in various research and development (R&D) endeavors. Gabunada (2013) highlighted that IA “provides indications of the achievements of R&D investments.” It is used as a reference “in making decisions for follow-up R&D investments” and to determine the need to continue the investments for similar R&D undertakings (Gabunada, 2013). Data used in IA come from primary and secondary sources that may include the adoption surveys, Key Informant Interviews (KII), Focus Group Discussion (FGD), field observation, R&D project reports, and database of agencies, among others. These data can be utilized both in the quantitative and qualitative impact assessments.

This impact assessment was guided by the concepts and principles of Diffusion of Innovation Theory by Everett M. Rogers (Rogers, 2003). This theory has five innovation-decision processes: 1) knowledge, 2) persuasion, 3) decision, 4) implementation, and 5) confirmation. Knowledge Stage is the first stage in the innovation-decision process wherein an “individual learns about the existence of the innovation and seeks information about the innovation.” In the Persuasion Stage, a positive or negative attitude towards innovation occurs. After knowing about the innovation, the individual shapes his or her attitudes about the innovation. This stage is known to be more affective-centered (Rogers, 2003). During the Decision Stage, the individual chooses to either adopt or reject the innovation. Adoption happens quickly when there is a partial trial basis because in most cases people would want to try the innovation first before adopting it. In the Implementation Stage, the innovation is already practiced. In the process of implementing the innovation, uncertainties about the outcome may hinder the continuity of the implementation. Roger (2003) claimed that the “implementer may need technical assistance from change agents and others to reduce the degree of uncertainty about the consequences.” A reinvention or the modification of innovation by the user happens during this stage (Rogers, 2003). Though implementation of the innovation has been made, an individual would still be looking for support on the decision he or she has made. During the Confirmation Stage, the individual is vulnerable to “conflicting messages about the innovation” that may revert one’s decision. It is very crucial on this stage. But there is a greater possibility that the individual implementing the innovation would seek supportive messages that will sustain the individual’s adoption of innovation (Rogers, 2003).

Hence, the study proposes the following theoretical assumptions: Farmers would adopt roselle technology when this is introduced to them. Farmers would sustain their adoption of the roselle technology when challenges are addressed by the project implementers.

METHODS

A qualitative research design, specifically a narrative descriptive approach was used. Most impact assessments are done quantitatively, and as commonly observed, “qualitative research plays ‘second fiddle’ to conventional empiricist’s investigation” but Garbarino and Holland (2009) asserted that qualitative methods are at par with quantitative designs on impact evaluation because they also create a “robust, timely data, and analysis” (Garbarino & Holland, 2009) thereby providing rich insights from personal experiences and even understanding of an individual’s perception and interpretation of events (Cresswell, 1998). In-depth interviews were conducted using the guide questions which were prepared ahead of time vis-à-vis the research objectives. In creating the guide questions, domains of change were first identified based on the QuIP framework. Scholz (2021) defined domains as the “areas of people’s lives and livelihoods which contribute to their well-being.”

In this study, two major domains of change were identified: factors that contribute to food security, and increased income of the target beneficiaries. There are two participants in the study, namely Zosima Abonite, 71 years old, and Dolores Cadiz Alabado, 50 years old. The participants were selected based on the following inclusion criteria: must be a farmer-beneficiary, a technology-adopter, lives in Mibantang, Quezon, Bukidnon within the project implementation period, and is willing to participate in the study. Prior to the conduct of the interview, the researchers read the informed consent form that was translated into vernacular, to the participants. Upon hearing, the participants agreed, signed, and consented to the interview. The interview for Zosima, a farmer-leader, reached 69 minutes while Dolores was interviewed for 54 minutes. Recorders, video cameras, and cell phones were used to document the interviews. After the interviews, debriefings were conducted by the team to discuss the highlights of the interview. Raw interviews were transcribed verbatim and processed into a series of information ready for analysis. A series of workshops was done to analyze the information gathered from the interviews. Three phases of coding were executed: open, axial, and selective coding. The workshop held a rigorous process of analysis where the research team developed, connected, and structured the emerging codes, categories, and themes.

RESULTS AND DISCUSSION

Agricultural Interventions through the Farmers’ Learning Center (FLC)

The Farmers’ Learning Center otherwise known as the learning farm cum community seed bank is a modality used to promote production and utilization of climate resilient crops initiated through the extension project. The FLC is a tangible output of the organization that promotes diversified and integrated farming system. It serves as the farmers’ laboratory where adaptability trials of climate resilient crops were planted through *bayanihan* held twice a month. These crops include the sweet potato varieties/lines to determine the best variety suitable in the area. This learning farm also served as the community seedbank. In 2017, the members of the FLC planted 34 lines of sweet potato and other crops like millet, corn and

upland rice as an adaptability trial. Of these 34 lines, 19 survived and were maintained by the farmer beneficiaries. Despite the dry spell experienced during the early part of 2018, three crops thrived namely foxtail millet, adlay, and roselle.

This study was conducted to explore the impact of agricultural interventions introduced through the project particularly the FLC and roselle and their contribution towards food security and increased income of the farmer beneficiaries. This impact assessment was initiated by the Department of Development Communication. In as much as one faculty of the Department was directly involved in the project, only select faculty members conducted this research. Two farmer-adopters were selected as participants based on the inclusion criteria set in this research. It utilized the qualitative research design specifically narrative descriptive approach. Data analysis was guided by the Qualitative Impact Protocol (QuIP) by Scholz (2021) incorporating the four-step method of textual analysis to explicate the essential themes which emerged from the data. Six themes were generated from the data analysis as shown in Figure 1. The themes are 1) enhancing farmers’ knowledge, 2) farmers as development partners, 3) roselle is a resilient crop, 4) roselle as potential source of income, 5) roselle has potential therapeutic benefits, and 6) challenges encountered.

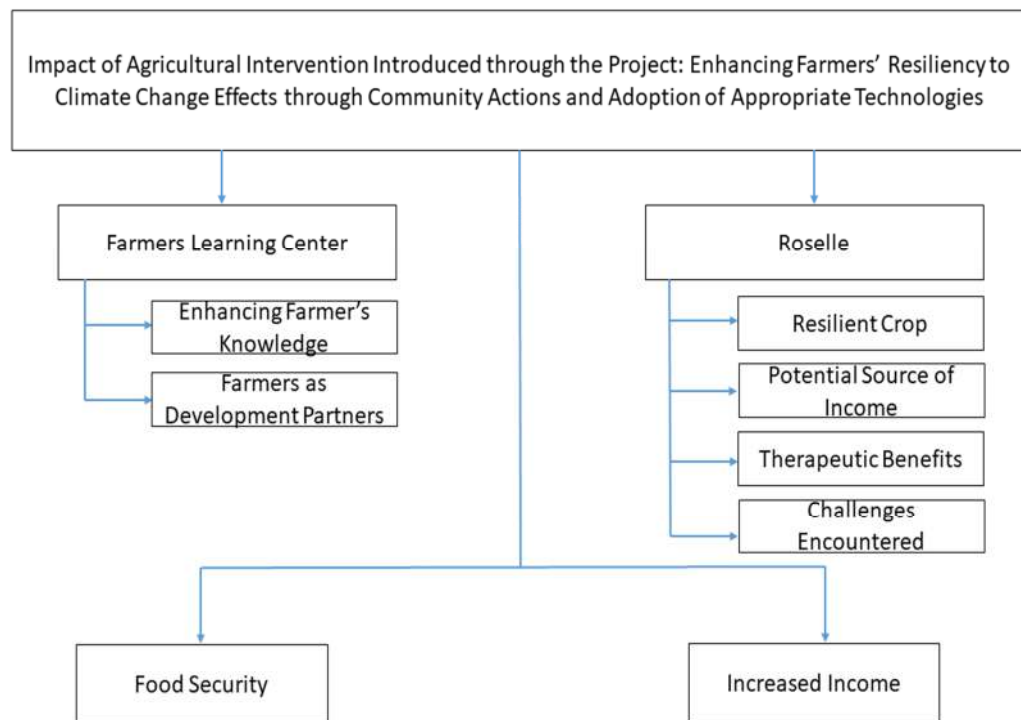


Figure 1. Thematic diagram on the impact of agricultural intervention to farmers in Mibantang, Quezon, Bukidnon

Enhancing Farmers' Knowledge

The participants were asked about their views on FLC. Both participants viewed the FLC as an avenue for enhancing their knowledge. It serves as a source of knowledge among farmers. As conceptualized, the FLC served as the laboratory for the farmer-beneficiaries to do adaptability trials with CMU experts who provided the technical assistance. As gleaned from the data, two factors have contributed to the farmers' knowledge enhancement. One is the external factor that includes the support from development-oriented organizations, and another is the internal factor that includes the farmer's inner motivation to learn.

External Factors

The participants claimed that their membership in development-oriented organizations such as Agro-Eco Philippines and the university became the stepping stone to building the FLC in their area. This claim is evident in the statement of Zosima, a farmer leader:

“Because I am a member of an NGO called AgroEco Philippines. Each organization has given us the right to FLC so that we can educate our members about various ways of farming.”

Through the FLC, farmers were encouraged to do on-farm research. The participants believe that FLC will increase their knowledge by researching various crops and the FLC gave them the right to educate their members on various ways of farming. Zosima stated that the FLC “will increase our knowledge by researching various crops.” Dolor echoes the same perception.

The participants perceived that these activities would hone them to become resilient that even without the support from other agencies, they can thrive. They, too, believed that as farmers, they needed to conduct various on-farm research. This perception veers away from the common notion that farmers do not experiment and innovate.

“It is our desire to continue with our purpose as farmers that we would become enthusiastic in doing various on-farm research.”

The FLC served as a modality “to promote the production and utilization of climate-resilient crops” which was realized through *bayanihan* of the FO members (Salingay, et al., 2017).

Internal Factors

Through the FLC, farmers developed an inner motivation to value hard work and good stewardship. They also learned the essence of research on a personal level. Below are the remarks of Dolores, a farmer-adopter, and Zosima, a farmer -leader, respectively:

“There is a need to put extra effort into your work because if you don't work hard, you have nothing to look forward to.”

“If you take research seriously, you are more than a professional because you will learn a lot from it.”

Because of their inner motivation, farmers zealously shared their insights to their peers, particularly on roselle processing such as juice making. Farmers in the FLC also motivated other parents to plant roselle because according to them, there is no assurance that they could sustain the provision of roselle juice all the time. This is highlighted in Zosima’s story:

“I encouraged the parents to plant roselle because there is no guarantee that we can provide for them all the time. Parents should plant so that they can prepare roselle juice for their children.”

Farmers as Development Partners

This research surfaced the idea that farmers are the main partners in development. They have indigenous knowledge that has been proven through their long years of farming experience. Hence, supports the study of Wang (2018) asserting that “farmers should not be treated as passive followers in the development of agricultural knowledge.” It means that farmers have innate abilities to observe, experiment, discover, and innovate on their respective farms.

Furthermore, farmers found out that through their on-farm research, various crops, particularly roselle, helped them and their respective families. Their inquisitive traits led them to uncover the potential benefits and usefulness of roselle. One of which is roselle juice making. With the help of CMU experts, these farmers also learned to make roselle jam and syrup.

Aside from roselle jam and syrup, farmers also explored making wine from roselle. They also tried making roselle tea by roasting and milling the roselle seeds until it is refined, as seen in their respective narratives:

“We have proven the usefulness of roselle. We did not limit ourselves to making roselle juice out of its raw calyces, but we also explored making roselle wine.”

“We roasted the roselle seeds and milled them until it’s refined. We used it as our coffee or tea.”

Roselle is a Resilient Crop

Through the FLC, the farmers observed that roselle thrives in dry and wet seasons. They also found out that roselle grows even in acidic soil as they claimed in their narratives below:

“Growing roselle is good even in the dry season. It also thrives in acidic soils.”

“But in wet seasons, it will also sustain.”

“Based on observation, roselle will grow wherever it is planted.”

The farmers also added that growing roselle is easy and would no longer require fertilizer. According to Broadbent (2022) “roselle is easy to root up and does not require a

rooting hormone but assures faster root growth. It can be propagated through seeds and cuttings. “Roselle can adapt to a variety of soil in a warmer and more humid climate (Singh, Khan, & Hailemariam, 2017).” Roselle is one of the crop varieties that are acceptable under various “abiotic stresses, drought, and delayed monsoon” (Maheswari, Sarkar, Vanaja, & ..., 2019).

Roselle as Potential Source of Income

The participants viewed roselle as having the ability to provide accessibility for adequate sources of income. According to FAO (2015), accessibility is one of the pillars of food security where it ensures economic sustainability. Dolor, a farmer-adopter, narrated that selling roselle juice supported her family in terms of buying rice, the Filipino’s staple food. She also explained how she managed to earn income from roselle. These are evident on her statements below:

“Before the lockdown, selling roselle supported me. It helped me a lot. I was able to buy rice for my family. At times, I would buy a dish but most of the time I buy rice to support my family.”

“I prepared roselle juice, packed it, and sold it at two or three pesos. I would place it in a small box and bring it to the school.”

Aside from selling roselle juice that provided income for the farmer-beneficiaries, others also earned from selling raw roselle flowers. “We sold roselle but only the raw calyces.”

Aside from providing income for the families of the participants, roselle also provided income for their farmer-organization. Zosima, a farmer-leader, emphasized that through their income on roselle, they developed their FLC. According to her, they built a small hut that served as their venue for meetings and other gatherings.

“We earned 10,000 out of these five lines [of roselle]. We used this to build our training center...”

Roselle helped the participants experience food security. Food security as defined by UNFAO is having “physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” by all people at all times (Gitz, Meybeck, Lipper, Young, & Braatz, 2016). Food security has four aspects that include availability of food, accessibility (economically and physically), utilization/consumption, and stability which comprises the first three dimensions (Gitz, Meybeck, Lipper, Young, & Braatz, 2016).

Roselle has Potential Therapeutic Benefits

The participants disclosed the therapeutic effects of using roselle. Dolor stated that more than the attractive flowers of roselle, it is an herbal plant:

“Roselle is nice and attractive. You would think it’s only a flower but an herbal plant as well.”

Dolor further shared that using roselle juice is helpful when having a urinary tract infection (UTI):

“If you are having difficulty urinating or if you have UTI, just drink roselle juice as often as you can. It will help you urinate.”

Aside from personally testifying about the health benefits of using roselle, Zosima claimed that her family has also reaped benefits from using the plant.

“I observed that roselle offers health benefits to my children and my entire family.”

One of the assertions that was very striking was the farmer’s claim that roselle juice drinking protects them from CoViD-19 infection. Zosima believed that roselle juice saved them from getting COVID-19 as it boosted their immune system.

“We have seen that at the start of the pandemic, roselle was a very big help; we have lots of roselle products, and people were buying our products to ward off the virus as they have observed that drinking roselle juice made them feel better. By God’s grace, all our constituents in the organization, even the entire barangay, had zero COVID case. We believe this is because of roselle; people from other places buy during that time to be protected from the virus and we have seen, we can testify that it is due to using roselle juice. Hence, we do not just derive money from selling raw roselle flowers but also gain physical benefits from drinking roselle juice.”

Furthermore, the farmers validate their observations and experiences by searching online:

“When I searched through Google, I found that roselle has eleven benefits.”

Truly, literature has established the medicinal uses of the various parts of roselle as it has a “potential non-pharmacological treatment” (Singh, Khan, & Hailemariam, 2017). Traditionally, roselle has been used as a folk medicine due to its mild laxative effect and its ability to increase urination, among others. Furthermore, roselle also plays a significant role in treating medicinal problems such as cardiovascular disorders and cancer. It also possesses antioxidant properties useful in obesity management (Singh et al., 2017).

The practice of online search by the farmer supports the earlier assertion that farmers possess critical thinking skills as they conduct experiment and innovate, hence exemplifying the notion of human agency as posited by Bandura in the social cognitive theory (2001). Agency, as described by Bandura, is human's ability to control their cognition, motivation and behavior thus farmers are not merely recipients of technology transfer but as development partners as they, like other human beings, possess the power to originate action (Bandura, 2001, p. 3).

Challenges Encountered

Despite the promising impact of roselle in terms of food security and increased income in the lives of the farmer-beneficiaries, a sudden phenomenon challenged them which emerged in the data. It was found out in the narratives of Dolores, a farmer-adopter, that the lockdown during the CoViD-19 surge plummeted the market opportunities of roselle products such as roselle juice. One of these potential markets mentioned by Dolores is the elementary school where children used to buy her roselle juice. Though many households also bought roselle in raw forms during the pandemic, Dolor asserted that the income was not as promising compared to selling roselle juice. This assertion is evident in her statement.

“During the lockdown, I got discouraged from planting roselle again because there was no market anymore where I could sell roselle products.”

Aside from the problem of the lack of market, other farmers also encountered problems in their roselle wine processing and roselle jam handling and storage. Zosima's roselle wine turned into vinegar and molds appeared in some of her containers with roselle jam. She thought of putting roselle jam in bottles instead of plastic containers. However, according to Joyce (2019), the use of new kinds of plastic is more energy efficient and leaves a smaller carbon footprint compared to glassware.

“I tried making wine. However, I wondered why the wine became vinegar.”

“There are molds on some roselle jam I prepared. I noticed that the container with molds was not sealed. I think it [roselle jam] would last in bottle containers not in plastic containers.”

Because of the problems they encountered, Zosima and Dolor hoped for more training that would address their problems encountered on roselle technologies. They narrated: “We desire and seek help on how to package our roselle products because we do not know how to do it.”

“But if I would learn how to package the roselle tea just like the Lipton tea, which will be called roselle tea, I would surely start planting roselle again because that is my dream so that I can produce more.”

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

Indeed, the research yielded strong evidence on the impact of the agricultural interventions, particularly the FLC and the propagation and commercialization of roselle on the lives of farmer-beneficiaries in terms of food security and increased income.

However, there are challenges encountered by the farmer beneficiaries that need to be addressed. These include the lack of market, and training on processing, handling, packaging and storage of roselle products.

The state university, as a partner agency of this farmer organization, may review the project and refocus its project goals. A program may consider providing support services specifically, continued training on roselle processing, handling, packaging and storage.

Aside from training, linking the farmer beneficiaries to agencies which provide equipment for processing, handling, packaging and storage will greatly help them. Also, initiatives that would help farmers on the promotion and marketing strategies of roselle products would be highly needed to resolve the farmer adoptors' marketing problems.

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