UPLIFTING THE LIVELIHOOD OF BULACAN AGRICULTURAL STATE COLLEGE (BASC) STUDENTS' FAMILIES THROUGH URBAN GARDENING

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ABSTRACT

This project aimed to empower students and their families in sustainable agriculture through capacity-building training workshops in urban gardening, organic farming practices, sustainable pest management, and agribusiness management. A socio-demographic assessment was conducted to establish baseline data, followed by hands-on training. The project successfully extended BASC's matured technologies to student families, allowing them to maximize agricultural potential, enhance food security, and create new livelihood opportunities through pesticide-free farming and agribusiness strategies. Participants gained practical skills in vertical gardening, edible landscaping, organic pesticide production, farm recordkeeping, and food processing and marketing strategies. These workshops provided essential knowledge and hands-on experience, equipping beneficiaries with the tools needed to implement sustainable agricultural practices. The findings indicate a significant improvement in farmers' awareness, technical skills, and confidence in adopting organic farming methods, leading to reduced reliance on synthetic inputs and increased household food security. Moreover, the establishment of backyard and urban gardens among student families contributed to improved access to fresh, pesticide-free produce. Some participants expanded their gardens for small-scale commercialization, demonstrating the potential for agripreneurship. The initiative also fostered stronger community engagement, enabling knowledge-sharing and collaboration among farmers, researchers, and local government units. Overall, this project highlighted the effectiveness of integrating research-based training and hands-on agricultural interventions to promote sustainable food production, enhance economic resilience, and contribute to environmental conservation. The success of this initiative underscores the need for continued technical support, market linkages, and policy advocacy to ensure long-term sustainability and scalability.

Keywords: *Urban gardening, organic farming, sustainable agriculture, agribusiness management*

1. INTRODUCTION

The pandemic produced by Covid-19 has exposed the fragility of the agri-food industry in developed countries, which is interwoven with the global supply chain and local need for pickers in the field and capillary delivery to consumers. The lockdown and transportation limitations in less developed countries interrupted links between rural and urban areas, jeopardizing the food security of cities (Wetaya, 2020).

Poverty is an inevitable issue that is not being totally addressed, especially for students' sake. For the whole country or households, assistance was given during the pandemic, but for students' sake, no livelihood, financial assistance, or uplifting of their morals was given. Other than the so-called "*plantitos*" and "*plantitas*" who get

involved in planting as their past time, other students should also be involved in gardening, not just for self-consumption, but could be their source of income. Capacitating these students will also be part of the college goals that will make them more resourceful and apply their knowledge by gaining technical know-how from BASC experts. Promoting BASC matured technologies to the community will also be a part of encouraging more people, especially students, to take part in food production and engage in and enroll in an agricultural school.

Organic agriculture has already shown to be a significant tool in the fight against conventional farming's detrimental impacts on the environment and people's health. Organic farming is promoted for a variety of reasons around the world, including real or perceived benefits in terms of environmental sustainability, health, food security, and food safety.

Policy gaps, a lack of production support, promotion and awareness initiatives, fragmented and inadequate research and development, extension and competence building operations, and inefficient market systems all pose hurdles to the promotion of organic agriculture in the Philippines. Being competitive with conventional agricultural systems" is one of organic agriculture's primary problems (NOAB, 2016).

Everywhere, there is an urgent need to deliver fresh food, particularly fresh items, to households. Furthermore, the total confinement that occurred in many countries left people not only distressed, but also in need of diverting daily spare time to a new home gardening vitalization, referring to this activity as "productive gardening" to avoid boredom or feeling unproductive as well as to reduce stress and anxiety. Plants' natural development rhythms do, in fact, aid to relieve stress (Luckstead et al., 2021).

With the current food shortages, this project might be greatly beneficial to each BASC student's family in terms of assisting them in becoming more resilient. This project will also emphasize what BASC is all about, being involved in the community and supporting it via agriculture.

Objectives

The project generally aimed to extend the BASC matured technologies to the BASC students' families regarding pesticide-free farming systems and agribusiness management, allowing them to maximize their potential and improve their living conditions by increasing production and expanding market opportunities for pesticide-free grown commodities.

Specifically, it aimed to:

1. determine the socio-demographic profile of BASC students' families in terms of:
   - 1.1. age;
   - 1.2. sex;
   - 1.3. number of household members;
   - 1.4. source of income of the family;
   - 1.5. farm size;
   - 1.6. farm location; and
   - 1.7. crops produced by the family.
2. capacitate the beneficiaries about pesticide-free crop production, marketing skills, processing and commercialization of their pesticide-free commodities; and
3. establish backyard/urban garden per student-family beneficiary.

2. RESEARCH METODOLOGY

The project aimed to empower students and their families in sustainable agriculture by conducting training on pesticide-free vegetable production, agribusiness management, and the establishment of techno-demo farms.

A Memorandum of Agreement was signed with the selected beneficiaries.

The study was divided into three components: **Component 1** – Assessment of the socio-demographic profile of students' families; **Component 2** – Capacity enhancement through the conduct of various training sessions; and **Component 3** – Establishment of backyard/urban gardens.

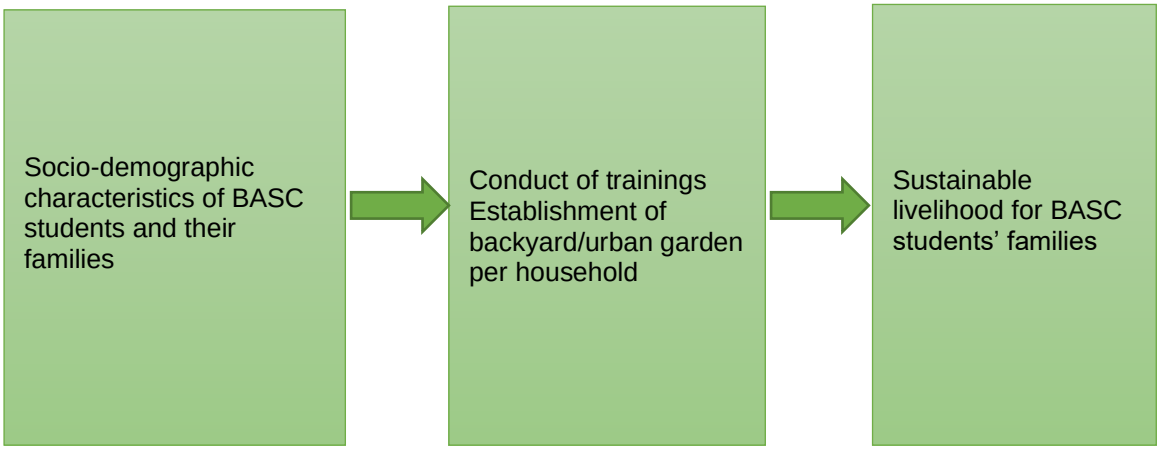

Figure 1. Conceptual framework of the study

PROJECT COMPONENTS

Component 1. Assessment of socio-demographic profile of BASC students' families

The first stage of this project is data gathering or data collection to establish baseline information on the selection of beneficiaries. Socio-demographic profile was obtained by conducting an online survey.

The first 3 months of the project, from date of notice to proceed, was devoted to Component 1- Assessment of socio-demographic profile of BASC students' families. The results of this stage will serve as a baseline or reference information that will assist in measuring the objectives of the project.

Evaluation of the income generated was assessed before and after the implementation of the project.

Data Collection Strategy

a. Coordination. As the project covers 3 municipalities in Bulacan, namely: San Ildefonso, San Rafael, and San Miguel, Bulacan, data collection was conducted in all these municipalities. As a strategy, the research team has initially coordinated with the Office of student's affairs and registrar office to secure a list of enrolled students and with the Department of Agriculture-Local Government Unit.

b. Survey Instrument. To efficiently gather the needed data, the researchers developed a survey questionnaire intended to collect information on socio-demographic profile of the respondents. The information that was gathered from the survey was constituted baseline data on profile of beneficiaries in the third district of Bulacan.

c. Data Analysis. The data collected was analyzed descriptively. Descriptive characteristics of the variables indicated in the survey instrument was tabulated. Stratified random sampling was used. The data collected was

sorted, tallied, tabulated and statistically treated using statistical software for accurate computations. The beneficiaries' profile in terms of age, sex, number of household members, size of the farm, family's source of income and farm location were presented using frequency distribution, percentage, mean and standard deviation.

Component 2. Capacity Enhancement through conduct of trainings

The second component consisted of various training sessions provided to the students and their families. The training sessions were as follows:

1. **Training on pesticide-free vegetable production** (urban gardening, edible landscaping, and production of organic fertilizers). The goal of this training was to boost crop yields, improve crop resilience, and reduce the environmental damage caused by pesticide misuse.
2. **Training on agribusiness management** (marketing, processing, and commercialization). This training was designed to teach students and their families how to make the best possible use of available resources in a constantly changing business environment.

A pre-test was given prior to the start of each activity, as well as after each seminar-training. In addition, each activity was accompanied by an evaluation or feedback survey to determine the impact and scope of the technology and practice that the beneficiaries have adopted.

Component 3. Establishment of Backyard/Urban Garden

The third component of the project focused on establishing backyard or urban gardens for each household beneficiary, providing students' families with technical assistance. The produce was utilized for marketing, processing, and commercialization, contributing to the improvement of the beneficiaries' livelihood.

Setting up a backyard/urban Garden

The upgraded backyard or urban garden functioned as a crop production area, aiming to be both productive and sustainable. Through the project's scheduled series of seminars and hands-on training, participants were educated on the cultivation and production of nutritious and easy-to-grow crops. The recording of inputs and outputs was also explored concerning various management and marketing strategies for harvested produce.

In addition to value addition and post-harvest processing, a balanced family meal menu was provided to promote health and wellness, particularly in the event of a pandemic. The project also facilitated connections between beneficiaries and potential market opportunities.

For marketing, thorough record-keeping was required to evaluate and measure the increase in beneficiaries' revenue resulting from the project's implementation. Beneficiaries were also involved in processing surplus food to create value-added products for sale. Furthermore, they were supported and linked to potential market opportunities, including cooperatives, municipal trade posts, private sector collaborators, and online marketing platforms.

3. RELATED RESEARCH/ LITERATURE REVIEW

Implementing urban gardening projects for families of students in agricultural colleges offers significant economic benefits, enhancing food security, promoting community engagement, and fostering sustainable practices. These initiatives not only provide fresh produce but also create opportunities for economic growth and educational experiences for students.

Urban gardens can reduce food costs for families by providing a direct source of fresh produce, which is particularly beneficial in urban areas where food prices are high (Mohapatra et al., 2024).

The cultivation of diverse crops allows families to engage in small-scale entrepreneurship, selling surplus produce at local markets, thus generating additional income(Karki & Bhandari, 2023).

Urban gardening projects serve as practical learning experiences for students, integrating theoretical knowledge with hands-on activities, which enhances their educational outcomes(Santos et al., 2024) (Pfeiffer et al., 2023). These projects foster community involvement, encouraging collaboration among students, families, and local residents, which strengthens social ties and community resilience(Hernandez-Herrera et al., 2024).

4. RESULTS AND DISCUSSION

Component 1. Socio-Demographic Profile Assessment

The first component involved data collection to establish baseline information for selecting beneficiaries. Socio-demographic data, including age, sex and educational attainment, were gathered through an online survey covering San Ildefonso, San Rafael, and San Miguel, Bulacan. The data analysis provided insights into the specific needs of the beneficiaries, guiding the development of targeted training modules.

The socio-demographic profile assessment provided essential baseline data to tailor the training programs to the specific needs of the beneficiaries. The study revealed that the majority of the participants were female (24 out of 40), indicating a strong interest in sustainable agriculture among women (Figure 2). This finding aligns with the growing recognition of women's important role in household food security and agribusiness development.

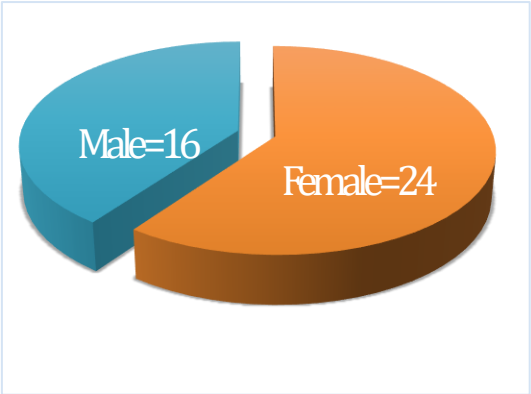

Figure 2. Sex of farmer participants

Age distribution showed that most participants belonged to the middle-aged adult group (18 individuals), followed by older adults (12) and young adults (10) (Figure 3). This age structure suggests a balanced participation across different age groups, allowing for intergenerational knowledge transfer and sustainability of farming practices.

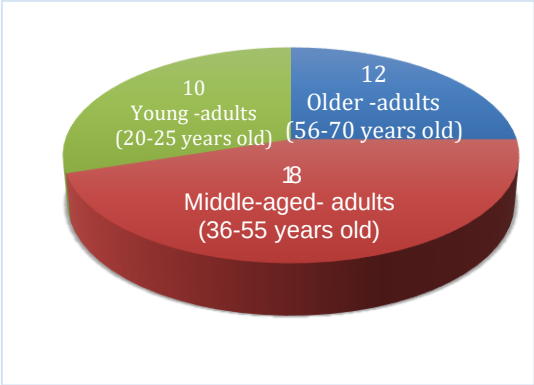

Figure 3. Age of farmer participants

Educational attainment data showed that the majority were high school graduates (21), with fewer participants having reached college education (Figure 4). This suggests a need for accessible and practical training that does not rely heavily on advanced academic backgrounds but focuses on hands-on learning. Given that a significant portion of participants had only elementary or high school education, training materials were designed to be simple, visual, and practical to maximize comprehension and application. The implications of these findings highlight the necessity of continued farmer education, particularly in areas related to organic farming, entrepreneurship, and modern agribusiness techniques.

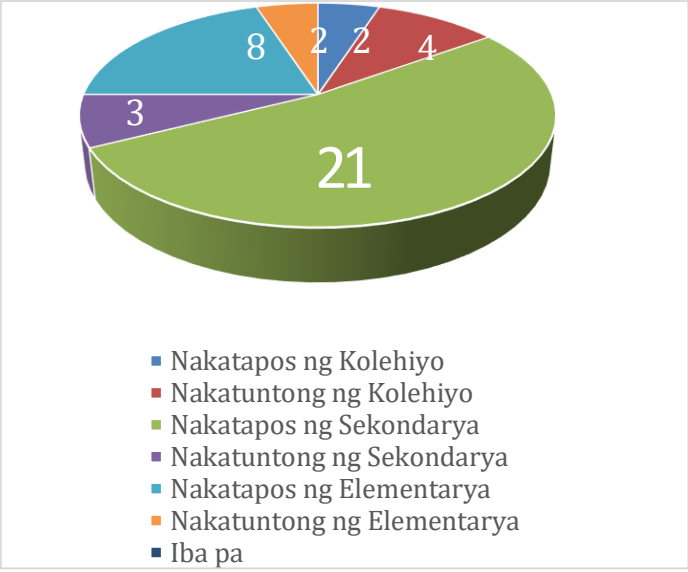

Figure 4. Educational attainment of farmer participants

Component 2. Capacity-Building Training Sessions

a. Vertical Gardening & Edible Landscaping (June 25, 2024)

The training focused on maximizing limited spaces for food production by integrating vertical gardening and edible landscaping techniques. Participants learned how to effectively utilize vertical structures to increase crop yields, allowing for better space management. They were also introduced to edible landscaping, which enhances the aesthetic appeal of gardens while providing food security. As a result, farmers developed a greater interest in sustainable home gardening and recognized its potential for improving household nutrition and economic opportunities.

b. Sustainable Farming: Organic Extracts, Biopesticides, and Recordkeeping (August 15, 2024)

This session introduced participants to chemical-free farming solutions through organic fertilizers, biopesticide production, and farm recordkeeping. Farmers received hands-on training in preparing organic fertilizers such as Fermented Fruit Juice (FFJ), Fermented Plant Juice (FPJ), Fish Amino Acids (FAA), Lactic Acid Bacteria Serum (LABS), and Indigenous Microorganisms (IMO). Additionally, they learned how to create organic pesticides using materials readily available in their backyards. The training also emphasized the importance of proper farm recordkeeping, which helps farmers track production costs, yields, and profitability. Participants found these skills highly applicable and expressed confidence in integrating organic pest control methods into their farming systems.

c. Food Safety, Nutrition, Processing, and Marketing (September 13, 2024)

The third training emphasized value-adding to agricultural produce through food safety, processing, and marketing strategies. Participants gained insights into food safety laws and best practices, particularly for home-based food production. A hands-on session on pickled ampalaya provided them with practical experience in food preservation techniques, allowing them to extend the shelf life of their products. Additionally, the session covered branding, packaging, and marketing strategies, helping farmers understand how to position their products in the local market and attract potential buyers. By the end of the training, participants demonstrated increased confidence in developing and commercializing their products.

Component 3. Establishment of Backyard and Urban Gardens

The third component of the project involved **the** establishment of backyard and urban gardens in the homes of student families. Following the training sessions, participating families were encouraged to apply their newly acquired skills by setting up their own pesticide-free vegetable gardens**.** The research team provided technical support, seeds, organic fertilizers, and instructional materials to assist in the implementation process.

Observations and follow-up visits revealed that **80%** of the beneficiaries successfully established their gardens**,** growing a variety of crops such as leafy greens, tomatoes, eggplants, and herbs. Families reported an increase in household food availability**,** reducing reliance on store-bought vegetables while ensuring access to fresh, chemical-free produce. Furthermore, some participants expanded their gardens for small-scale commercialization**,** selling surplus vegetables in their local communities. The establishment of backyard and urban gardens proved to be an effective strategy in promoting food self-sufficiency, environmental sustainability, and economic empowerment**.** The initiative encouraged families to utilize limited spaces efficiently and adopt sustainable farming practices that contribute to improved nutrition and income generation.

5. CONCLUSION

The project successfully strengthened farmers' technical knowledge and practical skills in sustainable and organic farming. Through a combination of theoretical learning and hands-on applications, participants demonstrated increased awareness, confidence, and willingness to adopt sustainable agricultural practices. The project also introduced agribusiness concepts, encouraging farmers to explore commercialization opportunities. Moving forward, follow-up training and continuous support through market linkages, monitoring, and policy advocacy will be essential to sustaining the impact of the program.

The project demonstrated that targeted training, community engagement, and knowledge-sharing are effective tools in transforming local agriculture into a sustainable and profitable sector, ensuring food security and livelihood enhancement for the participants and their communities.

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