

Enhancing School-based Food Production Initiatives to Scaffold School Feeding Program

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Publication Date: 2025/04/17

Abstract: The school has been aiming for the holistic development of every learner. Developing the domains, which include the cognitive, affective, and psychomotor, through various education and health interventions proves that the school has been fulfilling its role for every learner. Meanwhile, the acquisition process of holistic development of the educational domains becomes highly attainable if nourishing the physiological needs of the learner, particularly the health and nutritional needs, are given preferential attention. Thus, this study looked at the school's journey in supporting one of the thrusts of the Department of Education, which is achieving holistic development of learners through a school-based feeding program. This study applied the mixed methods research process. The quantitative research approach was employed in identifying the school-based food production initiatives implemented by the M. Guarina Elementary School, in determining the extent of implementation of the identified initiatives, and in recognizing the challenges encountered in the implementation of the school-based food production initiatives. Meanwhile, the qualitative approach was utilized to find out how the school-based food production initiatives enhance the school-based feeding program. The data provided by the research participants, as well as through content analysis, yielded the identification of the six (6) school-based food production initiatives. They were rice field cultivation, vegetable production, banana production, root crop production, greenhouse, and organic fertilizer making. These identified initiatives were all implemented to a high extent, which is reflective of the apparent and noticeable existence of the interventions. The presence of these initiatives aided the school-based feeding program by augmenting food supplies and sources, improving the nutritional quality of meals, enhancing collaboration among stakeholders, improving dietary choices, and mitigating nutritional issues. Despite the observed benefits of the school-based food production initiatives that scaffold school-based feeding program implementation, the implementers were challenged by the limited time intended for agriculture activities, insufficient knowledge on crop production, limited source of seedlings, lack of budget, and the limited production site. Such propelled the researcher to propose a school-based food production sustainability plan to enhance the school feeding program, anchoring it on the essence of partnership with the stakeholders.

Keywords: *School-Based Food Production Initiatives, School-Based Feeding Program, Scaffolding Process, Sustainable Interventions.*

How to Cite: Roberto D. Dolosa (2025) Enhancing School-based Food Production Initiatives to Scaffold School Feeding Program. *International Journal of Innovative Science and Research Technology*, 10(4), 364-376.
<https://doi.org/10.38124/ijisrt/25apr138>

I. INTRODUCTION

Schools represent an attractive and important setting for health promotion initiatives, as they provide continuous access to children during a critical developmental period. They play a crucial role in shaping children's habits, attitudes, and overall well-being during a critical and formative period. By reaching children in schools, health programs can have a lasting impact, helping them develop healthy habits early on that can carry into adulthood.

Schools often have structured environments that allow for regular health-related activities, whether it's physical education, nutrition education, mental health awareness, or

even social-emotional learning. Plus, schools can help extend the reach of health promotion to families, teachers, and the broader community, which can create a ripple effect for healthier environments overall.

It is believed that healthy and balanced nutrition has a significant effect on students' physical and mental development, which should be developed and be of importance in the lives of school children. If this is one of the initiatives of the school, no children will suffer from malnutrition.

Malnutrition is described as the insufficient intake of certain nutrients and the inability of the body to absorb or

use these nutrients (World Health Organization, 2014). Reports from the WHO (2014) indicated that inadequate nutrition in children under 5 years of age reduces their ability to reach their full physical and mental potential. Malnutrition refers to deficiencies or excesses in nutrient intake, imbalance of essential nutrients, or impaired nutrient utilization. The double burden of malnutrition consists of both undernutrition and overweight and obesity, as well as diet-related noncommunicable diseases. Undernutrition manifests in four broad forms: wasting, stunting, underweight, and micronutrient deficiencies.

Wasting is defined as low weight-for-height. It often indicates recent and severe weight loss, although it can also persist for a long time. It usually occurs when a person has not had food of adequate quality and quantity, and/or they have had frequent or prolonged illnesses. Wasting in children is associated with a higher risk of death if not treated properly. Stunting is defined as low height-for-age. It is the result of chronic or recurrent undernutrition, usually associated with poverty, poor maternal health and nutrition, frequent illness, and/or inappropriate feeding and care in early life. Stunting prevents children from reaching their physical and cognitive potential. Underweight is defined as low weight-for-age. An underweight child may be stunted, wasted, or both.

Micronutrient deficiencies are a lack of vitamins and minerals that are essential for body functions such as producing enzymes, hormones, and other substances needed for growth and development. Nutrition is a basic human need that remains unmet for vast numbers of children, who are hence unable to achieve their full genetic developmental potential. An estimated 150 million children in developing countries are projected as malnourished, which is 28 % of children under the age of five (UNICEF, 2011). Globally in 2011, an estimated 2 million children aged five years and below were admitted for treatment of severe acute malnutrition (UNICEF, 2012). Proper nutrition is essential for healthy growth, organ formation, and function, social and economic development (WHO, 2014). Research results also indicated that malnutrition is a resulting factor to poverty, which prevents people from learning new skills for the development of their community and economic growth (UNICEF, 2013).

School-based nutrition education through school food production is particularly important as children acquire academic learning and improve their health. School-based nutrition education that involves food production is a powerful approach for teaching children about healthy eating while also giving them practical, hands-on experiences. It not only helps them develop healthier eating habits but also empowers them to make better food choices, both at school and at home.

Incorporating food production into the school environment—such as through school gardens, cooking classes, or farm-to-school programs—helps students understand where food comes from, how it's grown, and how it can be prepared in nutritious ways. This kind of

education can foster a deeper connection to food and health, making students more likely to value and choose healthy foods as they grow older.

Moreover, it aligns with academic learning as well. For example, food production can integrate science (learning about plant biology, ecosystems), math (measuring ingredients or budgeting for a food program), and even social studies (exploring the cultural significance of different foods). This interdisciplinary approach enhances both their academic development and their health literacy.

According to the World Bank (2015), 25.2% of Filipinos were living below the poverty line in 2012. Poverty is, of course, a multi-faceted challenge, and poverty lines on their own are not adequate, as people can lie outside the World Bank or national poverty line and still suffer from various manifestations of poverty or deprivation, including malnutrition. Nevertheless, considering the high level of poverty in the Philippines and the consequently high level of childhood malnutrition, one question that arises is who can effectively tackle the high level of childhood malnutrition in the country?

Many studies have shown that nutritional problems all over the world share many similar factors in their causes (Kikafunda, et.al., Griffiths et.al., 2004; Heaton & Forste, 2003). These factors can originate and manifest at different levels of the child's environment i.e. family, household, community and nationally (Griffiths, et al., 2004) and included aspects such as educational level of the child's care-giver, household food security level, number of children under the age of five years in a household, child care practices, health care system and the national economic stability.

Therefore, to plan and deliver an effective preventive intervention program, the children at risk and the factors contributing to their malnourished condition should be identified. Otherwise, efforts in eradicating malnutrition would be redundant and wasteful (Rice, Saccol, Hyder, & Black, 2000).

Childhood malnutrition related to scarcity of food often presents as underweight or stunting. Underweight is defined as children who are weight-for-age two standard deviations less than the World Health Organization's (WHO) child growth standards median, while stunted is defined as height-for-age two standard deviations less than the WHO child growth standards median (Saha et al. 2009). The percentage of underweight children between 0-5 years of age is 26.2%, while the percentage of stunted children between 0-5 years of age is 27.9% (Food and Nutrition Research Institute 2008, page 6).

The relationship between poverty, food insecurity, and child malnutrition in developing countries has been established (Hackett et al. 2009), and these issues have been a significant focus of many NGOs. Although NGOs run various health interventions to improve children's and mothers' health in developing countries, the question of

“how effective are such interventions?” requires further exploration.

In the latest Social Weather Stations (SWS) survey held mid-year, at least 10.4 percent of Filipino families experienced involuntary hunger at least once in the past three months, higher than the hunger prevalence rate in March 2023. This scenario evokes even greater urgency when taken in the context of rising inflation in food prices. According to the latest Philippine Statistics Authority (PSA) data, food inflation rose to 8.9 per cent in August compared to 6.5 per cent in July. Higher rice prices were the leading inflationary factor. The growth rate in the rice index increased to 7.5 percent in August 2023 compared to 2.1 percent in the previous month. Prices of vegetables, tubers, plantains, cooking bananas, and pulses posted an inflation rate of 37.8 percent during the month, from 28.5 percent in July 2023

Malnutrition is a difficult condition to handle since it needs time, effort, and money to completely eradicate. One of the Department of Education's initiatives to assist the government in addressing the country's malnutrition is the implementation of the Gulayan sa Paaralan (School Garden) Program (GPP) as a poverty alleviation scheme that will help promote food security and economic stability for affected families. As a primary input in the school-based food program, this supplies vegetables high in protein, carbs, vitamin A, and iron. DepED Memo No. 293 (2007) ordered that all public elementary and secondary schools build school gardens to assure a continual supply of vegetables for the school-based food program. DepED Memo No. 95 (2018), to continue and strengthen GPP implementation to combat malnutrition and encourage vegetable production and consumption among students.

Establishing and maintaining a garden inside the school not only serves as a source of food in sustaining and aiding the feeding program, but also helps children to learn the value of nutrition and will surely keep them in good track to alleviate malnutrition. Mario Guarina Elementary School established a sustainable program tagged as Project BULIG – Biyayang Usbong sa taniman Inaalagaan para sa Lahat. This is under Division memorandum No. 168s.2022 known as Masaganang Paaralan.

This endeavor motivates the school stakeholders to be one in the implementation of the program and the researcher likewise has an eye on the effectiveness of the project and would like to conduct further study and better understanding in aid for the attainment of DepEd MATATAG and the betterment of the project in line with the academic proficiency of the learners and the nourishment of the school children who in the future will surely continuously promote the importance of planting vegetables in the school.

II. OBJECTIVES

This study attempted to find the enabling role of school-based production initiatives implemented in the school feeding program at M. Guarina Elementary School. Specifically, it answered the following sub-problems:

- What are the school-based food production initiatives implemented by M. Guarina Elementary School?
- What is the extent of implementation of the school-based food production initiatives?
- How do the school-based food production initiatives enhance the school feeding program?
- What are the challenges encountered in the implementation of school-based food production initiatives?
- What school-based food production sustainability plan can be designed to further enhance the school feeding program?

III. METHODOLOGY

This study employed mixed research methods. Particularly, the qualitative approach was used in identifying the school-based food production initiatives. Through the content analysis of the documents, specifically the program proposal and the accomplishment reports, the categories and themes were identified.

The respondents of this study are the recipient pupils of the feeding program, parents, and teachers of MGGES. There are 20 pupils who are the recipients of the feeding program of the school, 20 parents who are the parents of the recipient pupils, and 5 teachers who are in charge of the health and nutrition of the school. In treating the quantitative data, particularly the extent of the implementation of the school-based food production initiatives, the mean was used. In identifying the challenges, the frequency count and ranking were utilized.

IV. RESULTS AND DISCUSSION

The following provides the results, analysis, and interpretation of the study on the Enhancing School-Based Food Production Initiatives to Scaffold School Feeding Program, which was conducted. It also determined the school-based food production initiatives implemented in the school and the implementation made by the school, as it is correlated to the school-based feeding program. A proposed action plan and project proposal are prepared to enhance food production through the gulayan sa paaralan as a food source for the feeding program.

A. School-Based Food Production Initiatives Implemented at M. Guarina Elementary School

Crop production has been a thrust of the Department of Education (DepEd). A specific curriculum has been designed to focus on agricultural education and awareness. The presence of crop production in the school curricula helps the learners understand the importance of feeding the school learners who need food assistance. Aware of this Department's thrust, M. Guarina Elementary School has

implemented the following school-based production initiatives.

➤ *Ricefield Cultivation*

Ricefield Cultivation is visible in the school. The school has a lot of 250 sq. meters intended for palay production. *“The presence of a natural water source in the vicinity makes the school site ideal for rice growing”*. shared by P1, a teacher whose inclination is in the field of agriculture. The school has a rice field where students and stakeholders are involved in growing rice. They participate in planting, maintaining, and harvesting rice, learning about the process from start to finish. The rice grown has been used as part of the meals in the school’s feeding program. This helps ensure a local, sustainable source of rice to support the students’ nutritional needs, especially during the school’s feeding activities.

This effort is aligned with the Sustainable Rice Platform (2021), which highlights the importance of sustainable rice cultivation in ensuring food security. SRP’s initiatives focus on improving the livelihoods of smallholder farmers, reducing the environmental footprint of rice production, and providing an assured supply of sustainable rice. Moreover, the National Agriculture in the Classroom (2023) program emphasized the educational benefits of involving students in agricultural activities, such as rice cultivation. This hands-on learning approach helps students understand the entire process of rice production, from planting to harvesting, and its significance in their daily lives

➤ *Vegetable Production*

Based on the sharing of P2, the school has a garden where various vegetables, such as tomatoes, lettuce, and beans, are cultivated. *“The minimal lot area measuring 300 sq. meters is enough to grow some local vegetable species.”* Pupils and parents are directly involved in planting, nurturing, and harvesting these crops. The vegetables harvested from the garden can be used in the feeding program to provide fresh and nutritious ingredients for student meals. This supports healthy eating and reduces the reliance on outside sources for vegetables.

Incorporating vegetable gardens in schools offers a wide range of benefits for students, educators, and the overall community. These gardens promote healthier eating habits, provide valuable learning experiences, and support environmental sustainability. The hands-on experience of growing vegetables encourages students to develop a positive attitude towards fresh produce and nutritious food choices (Boucher, 2023). Linking School Gardens, School Feeding, and Nutrition Education in the Philippines: The Gulayan sa Paaralan (Vegetable Gardens in School) program in the Philippines supports school feeding programs by providing fresh, nutritious vegetables grown in school gardens. This initiative helps meet the nutritional needs of students, promotes healthy eating habits, and involves students and parents in the gardening process (Monville-Oro, Angeles-Agdeppa, Baguilat, Gonsalves, & Capanzana, 2020).

➤ *Banana Production*

Banana Production is one of the school-based food production initiatives implemented at M. Guariña Elementary School, as confirmed by P3. *“The small vacant lot is very ideal for growing bananas. The varieties of latundan and saba grow well in the place.”* Banana plants are grown on the school grounds, with students involved in the care and maintenance of the banana trees. The bananas can be harvested and included in the feeding program, offering a natural, local fruit option for the students. This adds variety to the meals and provides students with healthy fruit.

This initiative provides bananas to preschool children as part of a school fruit scheme. The project has shown that bananas can significantly reduce hunger, improve nutritional intake, and support cognitive and physical development in children. The involvement of students in growing and maintaining banana plants can also enhance their understanding of agriculture and nutrition (Sandnes Ebitu, Fegran, & Haraldstad, 2022).

➤ *Root Crop Production*

The presence of Root Crop Production is implemented in the school according to P3, *“Root crops like sweet potatoes, cassava, and taro are grown on the school farm. Students participate in planting and harvesting these crops.”* These root crops can be used in the school’s feeding program as a nutritious starch, complementing the meals provided to students and ensuring they have a balanced diet that includes carbohydrates.

Root crops such as sweet potatoes, cassava, and taro are rich in essential nutrients and provide a valuable source of carbohydrates. Including these crops in school feeding programs can help improve the nutritional status of students, support cognitive development, and enhance overall health. Studies have shown that integrating locally grown root crops into school meals can reduce food insecurity and promote sustainable agricultural practices (Munthali et al., 2024). Engaging students in the cultivation and harvesting of root crops can provide hands-on learning experiences that enhance their understanding of agriculture, nutrition, and sustainability. Programs that involve students in agricultural activities have been shown to increase their knowledge about food production, improve their attitudes towards healthy eating, and foster a sense of responsibility and community involvement (American Profession Guide, 2023).

➤ *Greenhouse Farming*

One of the active stakeholders said that the greenhouse is one of the priorities of the school. The school has a greenhouse where crops like vegetables and herbs can be grown in a controlled environment. This allows for year-round cultivation, even in unfavorable weather conditions. The crops grown in the greenhouse can supplement the feeding program by providing fresh produce throughout the year. This ensures a steady supply of healthy food, supporting the sustainability of the feeding program.

Greenhouses in school provide a controlled environment for growing crops, allowing for year-round cultivation regardless of weather conditions. This ensures a steady supply of fresh produce, which can be used to supplement school feeding programs. Greenhouses also offer hands-on learning opportunities for students, helping them understand plant biology, environmental sustainability, and agricultural practice (Greenhouse Education Centers, 2023). Moreover, according to Gothic Arch Greenhouses (2025), integrating greenhouse programs in schools promotes sustainability and environmental awareness. These programs enable students to engage in practical, hands-on education while learning about food production, climate change, and sustainable practices. The fresh produce grown in school greenhouses can enhance the nutritional quality of school meals and support the sustainability of feeding programs.

➤ *Organic Fertilizer Production*

Organic Fertilizer as specified by P4 is practiced by the school: “The school produces its organic fertilizer by composting food scraps, plant waste, and other organic materials.” Students help in the process of making and applying the fertilizer. Using organic fertilizer promotes healthy, sustainable farming practices and helps produce higher-quality crops for the school’s feeding program. It ensures that the food produced is grown in an environmentally friendly way, which aligns with the school’s focus on sustainability and health.

All of the food production initiatives at M. Guarina Elementary School are closely linked to the school-based feeding program. The main connections are: Self-Sufficiency, these initiatives reduce the school’s reliance on external sources for food by providing homegrown produce. The school can use its own rice, vegetables, bananas, root crops, and greenhouse-grown produce to prepare meals for students. Nutrition, the food grown on-site, provides students with access to fresh, healthy, and nutritious meals. This is important for the school’s feeding program, which aims to ensure that students receive the necessary nutrients for growth and learning. Sustainability, by producing food locally and using organic fertilizers, the school ensures that its feeding program is more sustainable and environmentally friendly. The initiatives also teach students valuable lessons about sustainability, agriculture, and food security. Educational Value: Students learn about farming and food production while directly contributing to the school’s feeding program. This helps them understand where their food comes from and why eating healthy, locally produced food is important. Cost-Effectiveness, growing food on school grounds can reduce the costs associated with buying food from external suppliers, making the feeding program more cost-effective in the long run. In summary, the school-based food production initiatives at M. Guarina Elementary School are directly connected to the school’s feeding program by providing fresh, nutritious food that supports the health and well-being of students, while also promoting sustainability and self-sufficiency. School-based nutrition and food safety education intervention resulted in a significant impact on students’ nutrition knowledge.

Organic fertilizers, such as compost made from food scraps and plant waste, improve soil structure, increase nutrient availability, and enhance water retention. These benefits contribute to healthier, more sustainable farming practices and higher-quality crops. Using organic fertilizers aligns with the school’s focus on sustainability and health (Silva,2018).

According to McCullum-Gomez (2023), School-based food production initiatives reduce reliance on external food sources, provide fresh and nutritious meals, and promote sustainability. These programs also offer educational value by teaching students about agriculture, food security, and healthy eating. Moreover, the Centers for Disease Control and Prevention. (2024) said that school-based nutrition and food safety education interventions have been shown to significantly improve students' nutrition knowledge. These programs help students understand the importance of healthy eating and the benefits of locally produced food.

B. Extent of Implementation of the School-Based Food Production Initiatives

The presence of the school-based food production initiatives requires participation from the stakeholders. The participation of the school head, teachers, pupils, parents, and the community determines the extent of implementation.

Table 1. Extent of Implementation of Rice Field Cultivation

Indicators	Mean	Description
Cultivating palay to ensure support of the rice supply	4.39	High
Observing the organic way of rice farming	4.22	High
Sustaining the irrigation, paddy, and mudflat	4.17	High
Tilling the field with the assistance of stakeholders	4.22	High
Average	4.25	High

Table 1 shows that cultivating palay to ensure support of rice supply to school feeding has the highest mean score of 4.39, which indicates that the rice field cultivation is highly effective in ensuring that rice is available for the school’s feeding program. The “high” rating suggests that the initiative is well-implemented and effectively supports the school’s rice supply. With a mean score of 4.22, observing the organic way of rice farming, this indicator also falls under the "High" category, meaning that organic farming methods are being actively practiced in the rice cultivation process. This shows that the school is prioritizing sustainable, eco-friendly practices in its farming operations. It also shows that Sustaining the Irrigation, Paddy, and Mudflat with a mean score of 4.17 suggests that the school is doing well in maintaining the irrigation system, paddy fields, and mudflats, which are crucial for the success of rice farming. While slightly lower than the first two indicators, it still indicates a "High" level of implementation.

The involvement of stakeholders in tilling the rice field scored a mean of 4.22, which means that there is strong

community or external support for the rice field cultivation process. This reflects a "High" level of collaboration, which is important for ensuring the sustainability of the farming practice. The overall average score of 4.25 suggests that the extent of the rice field cultivation's implementation is generally "High." This means that the school is effectively carrying out its rice cultivation initiative, ensuring that it supports both the school's rice supply and its educational goals. The data from Table 1.1 shows that the Rice Field Cultivation initiative at M. Guarina Elementary School is being implemented to a high extent, with all indicators scoring in the "High" range. This indicates that the rice cultivation process is well-managed and contributes significantly to the school feeding program, supports sustainable agricultural practices, and involves the community. The overall high score reflects the success of the program in meeting its objectives and contributing to the school's food security and sustainability goals.

Molijon (2014) revealed that schools used and maintained *gulayan sa paaralan* which include rice cultivation as it served as food basket or main source of cooking ingredients in sustaining school health and nutrition related activities like feeding program wherein students with low nutrition level were given assistance to help improve nutritional status that will also lead to better performance at school.

Table 2. Extent of Implementation of Vegetable Production

Indicators	Mean	Description
Growing a variety of vegetables to augment the school feeding program needs	4.52	High
Cultivating vegetables to ensure enough produce for the feeding program	4.88	Very High
Ensuring learners' participation in vegetable growing	4.50	High
Letting parents be involved in vegetable gardening	4.43	High
Average	4.58	High

Table 2 shows the extent of the implementation of vegetable production at Mario G. Guariña Elementary School. With a mean score of 4.88, Cultivating Vegetables to Ensure Enough Produce for Feeding Program achieved a "Very High" rating. It indicates that the school is highly successful in producing enough vegetables for the feeding program, ensuring a sufficient and continuous supply of fresh produce. This is a key success factor in sustaining the feeding program over time.

Growing a variety of vegetables to augment the school feeding program needs as an indicator received a mean score of 4.52, which falls in the "High" range. This means the school is successfully growing a variety of vegetables to meet the nutritional needs of the school feeding program. The diversity in vegetables ensures that students are getting a balanced and varied diet. Ensuring Learners' Participation

in Vegetable Growing. This indicator scored 4.50, which is also in the "High" category. It shows that the students are actively involved in the vegetable growing process, which not only supports the feeding program but also provides educational value. Involving students in gardening helps them learn about nutrition, agriculture, and sustainability.

Letting parents be involved in vegetable gardening, with a mean score of 4.43, this indicator is in the "High" category, reflecting that parents are actively engaged in the vegetable gardening process. Their involvement fosters a sense of community and shared responsibility for the school's food production, further strengthening the school's relationship with the community. The overall average score of 4.58 indicates a "High" level of implementation. This demonstrates that the school is effectively carrying out its vegetable production initiative, ensuring that it contributes significantly to the feeding program, engages students, and involves the community.

The data from Table 2 shows that the vegetable production initiative at M. Guarina Elementary School is implemented to a very high degree. The indicators show strong results, especially in cultivating enough vegetables for the feeding program and ensuring learner participation. The involvement of parents also highlights the community-based approach of the initiative. With an overall average of 4.58, the vegetable production is highly effective in meeting the school's feeding program needs and contributes to the school's sustainability and educational goals.

Table 3. Extent of Implementation of Banana Production

Indicators	Mean	Description
Raising varieties of bananas to support the feeding program	4.48	High
Involving the community/stakeholders in growing the banana	4.43	High
Adopting organic banana farming	4.04	High
Average	4.32	High

The data from Table 3 shows the extent of implementation of banana production at Mario G. Guariña Elementary School. Raising Varieties of Bananas to Support the Feeding Program with a Mean of (4.48) falls into the "High" category. It indicates that the school is successfully growing different varieties of bananas to contribute to the feeding program, ensuring a consistent and reliable supply of bananas for students. The mean score of 4.43 for Involving the Community/Stakeholders in Growing bananas indicator also falls under "High," suggesting that the school is effectively involving the community and stakeholders in the banana production process. This is important for fostering community engagement and ensuring the sustainability of the banana farming initiative.

Indicator, Adopting Organic Banana Farming, with a mean score of 4.04, is still in the "High" category, indicating that the school is implementing organic banana farming practices. This approach aligns with the school's

commitment to sustainable and eco-friendly agricultural practices, contributing to both the quality of the bananas and environmental sustainability. The overall average score of 4.32 suggests that the implementation of banana production is generally "High," reflecting that the school is successfully cultivating bananas, involving the community, and using sustainable farming methods.

The data from this table shows that Banana Production at M. Guarina Elementary School is effectively supporting the feeding program. The school has successfully raised varieties of bananas, actively involved the community, and adopted organic farming practices, all contributing to a High level of implementation. With an average score of 4.32, it shows that banana production is a strong component of the school’s food production initiatives, enhancing both the nutritional value of the school meals and the sustainability of the feeding program.

Table 4. Extent of Implementation of Root Crop Production

Indicators	Mean	Description
Cultivating a variety of root crops to support the feeding program	4.39	High
Allowing learners to grow a particular root crop	4.44	High
Involving parents to till a certain area for root crop production	4.00	High
Average	4.28	High

Table 4 demonstrates that the Extent of Implementation of Root Crop Production at M. Guarina Elementary School reflects a high level of success in its agricultural initiatives. The school has been effective in cultivating a variety of root crops, such as sweet potatoes and cassava, to support the feeding program, with an average score of 4.39 for this indicator, indicating a "High" level of implementation. This ensures that a diverse range of root crops is available to contribute to the nutritional needs of students. Additionally, the school allows learners to actively participate in growing a particular root crop, which scored 4.44, also reflecting a "High" level of engagement. This involvement provides educational value by teaching students about agriculture and food production. Furthermore, the school involves parents in tilling specific areas for root crop production, which scored 4.00, showing that the community plays a key role in supporting the initiative.

The overall average score for the implementation of root crop production is 4.28, which again falls in the "High" category, indicating that this initiative is well-integrated into the school’s broader food production efforts, benefiting both students and the community.

Table 5. Extent of Implementation of Greenhouse Farming

Indicators	Mean	Description
Providing a controlled environment for growing certain plants	4.52	High
Ensuring seedlings supply for the school greening program	4.45	High
Nurturing certain plant varieties that need a controlled environment	4.55	High
Average	4.61	High

Table 1.5 indicates the extent of implementation of the greenhouse. With a mean of 4.52 for the indicator, providing a controlled environment in growing certain plants, indicating a “High” level of implementation, the greenhouse successfully provides the necessary conditions for certain plants to grow, supporting sustainable agricultural practices. Ensuring seedlings supply for school greening program with a mean of 4.45 shows “High” level of implementation, and the school ensures a steady supply of seedlings for the greening program, which contributes to environmental education and beautification efforts.

A weighted mean of 4.55 for Nurturing certain plant varieties, which need the controlled environment, indicates a “High” level of implementation and shows that the school effectively nurtures plant varieties that require specific conditions, demonstrating the successful implementation of the greenhouse.

The overall high score of 4.6 indicates that the greenhouse provision is highly successful and well-implemented.

Table. 6. Extent of Implementation of Organic Fertilizer Production

Indicators	Mean	Description
Producing organic fertilizer for school use	4.48	High
Letting learners experience the process	4.39	High
Linking to other entities to sustain organic fertilizer supplies	4.00	High
Average	4.29	High

Producing organic fertilizer for school use with a mean of 4.48 descriptively falls under the “High”, indicating that the school is highly successful in producing organic fertilizer for its own agricultural needs, ensuring a sustainable and eco-friendly approach. With a mean of 4.39, letting learners experience the process shows a “High” indicator, and that students are actively involved in the process of organic fertilizer production, providing them with practical experience in sustainable practices. Linking to other entities to sustain organic fertilizer supplies with a mean of 4.00 means “High” level of implementation and shows the school maintains strong connections with external

entities to ensure a consistent supply of materials for organic fertilizer production.

The overall score of 4.29 indicates that the implementation of organic fertilizer production is strong, contributing to the school's sustainability efforts.

According to McDilda (2007), Organic fertilizer production refers to the growing, raising, or processing of food without drugs, synthetic chemicals, or hormones, using methods that conserve natural resources and limit the effects on the environment.

C. How the School-Based Food Production Initiatives Enhance the School-Based Feeding Program

The integration of School-Based Food Production Initiatives at M. Guarina Elementary School plays a crucial role in enhancing the school-based Feeding Program. These initiatives not only provide essential food sources for the feeding program but also foster community engagement, sustainability, and improved nutrition for students. Below are the narratives and discussion on how these initiatives contribute to the feeding program across different aspects.

➤ *Augmenting Food Supplies and Sources*

According to P5, *"The food production initiatives, including rice field cultivation, vegetable production, banana production, root crop production, greenhouse provision, and organic fertilizer production, significantly increase the availability and variety of food for the school feeding program."* By growing a wide range of crops, the school can provide diverse food items, ensuring a steady and consistent supply. As a supplementary source of food supplies, the implementation of the school-based feeding program is facilitated.

"This local production reduces the dependency on external food suppliers, mitigating potential supply chain disruptions, and ensuring that fresh, organic food is readily available for the feeding program," added P6. Furthermore, involving students and the community in food production fosters a sustainable approach to food security, reinforcing the school's commitment to self-sufficiency.

➤ *Improving the Nutritional Quality of Food Servings*

Participant 5 further stated, *"By cultivating organic vegetables, fruits, and root crops, the school ensures that the food provided to students is not only fresh but also nutritious."* Organic farming practices, especially in vegetable and fruit production, reduce the use of harmful chemicals and enhance the nutritional quality of the food.

Students benefit from a well-rounded diet that includes a variety of nutrients, vitamins, and minerals. Involving students in the food production process also teaches them about healthy eating habits and the importance of consuming fresh, locally grown produce. By having access to such high-quality meals, students are better equipped to focus on their learning and overall development.

The success of these food production initiatives relies heavily on collaboration among various school stakeholders, as stated by P7, including students, teachers, parents, and local community members. Community engagement is a key feature of the program, with parents and local stakeholders actively participating in planting, harvesting, and maintaining the school's agricultural activities. This shared responsibility strengthens the sense of ownership and pride within the community and ensures that the food production initiatives are sustained. Additionally, partnerships with external entities for organic fertilizer supplies and other resources further enhance the sustainability of the feeding program.

➤ *Addressing Common Nutritional Issues*

Participant 8 noted that the involvement of students in growing their food gives them hands-on experience and encourages them to make healthier dietary choices. As students learn about the different types of crops and their nutritional benefits, they are more likely to appreciate and consume a variety of fruits, vegetables, and whole grains. The exposure to different types of food through the school's agricultural programs also broadens students' understanding of diverse diets, reducing their reliance on processed foods. As a result, the school's feeding program not only addresses immediate nutritional needs but also promotes long-term healthy eating habits among students.

It is noted by Participant 7 that the school's food production initiatives play a vital role in addressing common nutritional issues such as malnutrition, food insecurity, and poor dietary habits. By producing nutrient-dense foods like vegetables, root crops, bananas, and rice, the school can directly tackle deficiencies in essential nutrients. The consistent supply of fresh and organic food helps ensure that students receive balanced meals, reducing the risk of micronutrient deficiencies and improving overall health. Additionally, the involvement of students in the production process provides them with the knowledge and skills to address food insecurity and nutritional issues in their communities in the future.

The school-based food production initiatives at M. Guarina Elementary School significantly enhance the school-based feeding program in multiple ways. By augmenting food supplies, improving the nutritional quality of meals, fostering collaboration, encouraging better dietary choices, and mitigating nutritional issues, these initiatives not only support the immediate needs of students but also contribute to their long-term well-being and education. The combination of hands-on learning and sustainable food production practices creates a holistic approach to addressing food security and promoting healthy lifestyles, benefiting both the students and the broader community.

D. Challenges Encountered in the Implementation of School-Based Food Production Initiatives

Implementing certain initiatives in the school level exposes the program owners and the stakeholders to several challenges. In the implementation of school-based food

production initiatives, stakeholders of M. Guarina Elementary School had the following challenges.

Table 7. Challenges Encountered in the Implementation of School-Based Food Production Initiatives

Challenges	Frequency	Rank
Lack of budget intended for the food production initiatives	7	5.5
Limited production site	7	5.5
Lack of support from stakeholders	9	4
Limited time intended for agriculture Activities	19	1
Limited knowledge on crop production	14	2
Limited source of seedlings	13	3

The most significant challenge faced by the school is the limited time available for agricultural activities, which are reported by 19 respondents. This indicates that the school's agricultural initiatives are constrained by the school's schedule, leaving insufficient time for planting, nurturing, and harvesting crops. Since the school's primary focus is education, time allocated for food production may be minimal, affecting the extent to which these initiatives can be carried out effectively. Teachers and students may find it difficult to balance classroom duties with agricultural activities, limiting the overall success and sustainability of the food production program.

A challenge faced by 14 respondents is the limited knowledge on crop production, ranked second in importance. This suggests that some of the individuals involved in the agricultural initiatives, whether teachers, students, or community members, may not possess sufficient expertise in crop farming. Lack of knowledge can lead to poor planning, mismanagement, and lower yields, impacting the success of food production efforts. Providing training, workshops, and support from agricultural experts could help overcome this challenge, improving the overall effectiveness of the initiatives.

Limited source of seedlings reported by 13 respondents is another challenge that ranked third. Without a reliable and consistent supply of seedlings, the school's ability to produce food may be compromised. The lack of access to high-quality, diverse, or sufficient seedlings could slow down the production process and lead to gaps in the feeding program. Establishing relationships with local nurseries, agricultural cooperatives, or other sources of seedlings could mitigate this issue, ensuring the program has the resources needed to grow a variety of crops.

The lack of support from stakeholders reported by 9 respondents is a challenge that ranked fourth. This indicates that the school may not be receiving enough engagement, resources, or involvement from the wider community, including parents, local businesses, or government entities. Without adequate support, the food production initiatives may struggle to achieve their full potential. Building

stronger partnerships, creating awareness about the importance of the initiatives, and involving stakeholders in planning and decision-making could help address this challenge.

A challenge identified by 7 respondents is the lack of budget allocated for food production initiatives. This challenge ranked 5.5 equally with the issue of limited production sites. Financial constraints can restrict the school's ability to purchase necessary materials, tools, or resources for food production, such as seeds, fertilizers, and equipment. The budgetary limitations may also hinder the expansion of agricultural activities or the maintenance of existing initiatives. Securing additional funding through grants, donations, or partnerships with local businesses and government agencies could help address this challenge.

The limited production site reported by 7 respondents is another challenge that ranks 5.5 equally with the budget issue. A lack of available land or space for growing crops can limit the scope of food production and affect the scale of the feeding program. Without sufficient space, the school may not be able to grow enough food to meet the needs of the students. Exploring alternative spaces, such as using vertical farming techniques, raised beds, or collaborating with local farms, could help alleviate this issue. The challenges encountered in the implementation of the school-based food production initiatives at M. Guarina Elementary School highlight several critical areas that need to be addressed for the program's success. The most pressing issues include limited time for agricultural activities, lack of knowledge on crop production, and insufficient sources of seedlings. Additionally, budget constraints, limited production sites, and the lack of support from stakeholders further hinder the program's effectiveness. Addressing these challenges through improved training, additional funding, stakeholder engagement, and better use of available resources will strengthen the school's food production initiatives and ultimately enhance the feeding program's sustainability and success.

E. Proposed School-Based Food Production Sustainability Plan to Enhance School Feeding Program

➤ *Rationale:*

To ensure the long-term success and sustainability of the school-based food production initiatives at M. Guarina Elementary School, a comprehensive sustainability plan is needed. This plan aims to address the challenges encountered, optimize the current resources, and ensure that the feeding program remains consistent, nutritious, and engaging for students. Below is a proposed sustainability plan to enhance the school feeding program through the school-based food production initiatives.

To ensure the long-term success and sustainability of the school-based food production initiatives, this comprehensive plan addresses challenges, optimizes resources, and ensures the feeding program remains consistent, nutritious, and engaging for students.

➤ *Objectives:*

- Enhance student and teacher participation in food production activities.
- Build capacity and agricultural skills among stakeholders.
- Secure reliable sources of seedlings and resources.
- Diversify funding sources to ensure financial sustainability.
- Maximize the use of available land and space for food production.
- Increase stakeholder engagement and community involvement.
- Improve harvest management and storage solutions.
- Implement effective monitoring and evaluation of the program.

➤ *Strengthening Time Allocation and Scheduling**Session Guide:*

- Introduction to Agricultural Activities: 1-hour session to introduce the importance of agricultural activities.
- Curriculum Integration Workshops: 2-hour sessions for teachers to integrate agricultural activities into science and environmental education.

Monitoring and Evaluation:

- Track the number of dedicated time slots and curriculum integration.
- Collect feedback from teachers and students on the effectiveness of the schedule.

➤ *Capacity Building and Agricultural Training**Session Guide:*

- Basic Crop Production: 3-hour training on crop production techniques.
- Organic Farming and Pest Control: 2-hour workshops on organic farming practices.
- Sustainable Agriculture: 2-hour sessions on sustainable agricultural methods.

Monitoring and Evaluation:

- Assess the number of training sessions conducted and participant attendance.
- Evaluate the improvement in crop yields and quality through regular assessments.

➤ *Expanding Seedling Sources and Establishing Partnerships**Session Guide:*

- Partnership Development Meetings: 1-hour meetings with local nurseries and agricultural offices.
- Community Engagement Sessions: 1-hour sessions to encourage donations and support.

Monitoring and Evaluation:

- Monitor the number of partnerships established and resources secured.
- Track community involvement and contributions.

➤ *Diversifying Funding Sources**Session Guide:*

- Grant Writing Workshops: 2-hour sessions on applying for grants.
- Fundraising Event Planning: 2-hour workshops on organizing community fundraising events.
- Entrepreneurial Model Training: 2-hour sessions on selling surplus produce

Monitoring and Evaluation:

- Track the number of grants applied for and received.
- Monitor the funds raised through community events and produce sales.

➤ *Maximizing the Use of Available Land and Space**Session Guide:*

- Vertical Farming Techniques: 2-hour training on vertical farming.
- Hydroponics and Raised Garden Beds: 2-hour workshops on space-efficient farming methods.

Monitoring and Evaluation:

- Assess the implementation of space-efficient techniques.
- Evaluate the increase in crop yields and land utilization.

➤ *Increasing Stakeholder Engagement and Community Involvement**Session Guide:*

- Volunteer Days: Organize monthly volunteer days for planting, weeding, and harvesting.
- Advisory Committee Meetings: Quarterly meetings with the School Feeding Program Advisory Committee.

Monitoring and Evaluation:

- Track the number of volunteer participants and activities conducted.
- Monitor the effectiveness of the advisory committee's guidance and support.

➤ *Improving Harvest Management and Storage Solutions**Session Guide:*

- Storage Facility Management: 1-hour training on managing storage facilities.
- Harvest Rotation System: 1-hour sessions on implementing a rotation system.

Monitoring and Evaluation:

- Assess the reduction in food waste and spoilage.
- Monitor the consistency of food supply for the feeding program.

➤ *Monitoring and Evaluation of the Food Production Program**Session Guide:*

- M&E System Development: 2-hour workshops on developing a monitoring and evaluation system.

- Feedback Sessions: Monthly feedback sessions with students, teachers, and parents.

Monitoring and Evaluation:

- Track the progress of food production initiatives through data collection.
- Evaluate the effectiveness of the program based on feedback and make necessary adjustments.

To ensure the long-term success and sustainability of the school-based food production initiatives at M. Guarina Elementary School, a comprehensive monitoring and evaluation (M&E) system will be implemented. This system will track progress through data collection and analysis, measure performance indicators such as crop yields and participation rates, and gather feedback from stakeholders via surveys and focus groups. Regular progress reports will be prepared, and updates will be shared with stakeholders to maintain transparency. Continuous improvement will be achieved by developing action plans based on M&E findings, adapting strategies as needed, and providing ongoing training and support to stakeholders. This approach will ensure the program remains effective, sustainable, and continuously improving.

V. CONCLUSIONS

Based on the foregoing findings, the following conclusions were derived: (1) M. Guarina Elementary School implements school-based food production initiatives and other farming initiatives that primarily support the school-based feeding program implementation. (2) The school-based food production initiatives at Mario G. Guarina Elementary School are highly implemented, contributing to the school-based feeding sustainability and community involvement. (3) The school-based food production initiatives at M. Guarina Elementary School enhance the school-based feeding program by improving food availability, nutritional quality, and fostering community engagement, while promoting long-term health and sustainable practices. (4) The challenges faced in implementing school-based food production initiatives at M. Guarina Elementary School include limited time for agricultural activities, limited knowledge on crop production, insufficient seedlings, budget constraints, limited production sites, and inadequate stakeholder support. (5) A school-based food production sustainability plan is proposed to enhance the school-based feeding program

RECOMMENDATIONS

(1) The school-based food production initiatives be expanded by including more diverse such as leguminous plants and a native variety of vegetable plants. (2) The school-based food production initiatives be further enhanced by integrating additional sustainable farming techniques and practices, thereby strengthening partnerships with local organizations. (3) More diverse crops be introduced in the school-based production initiatives, which are an essential component in the school feeding program implementation.

- (4) Additional funding, collaboration with agricultural experts, and expanding production sites be given priority by the school to overcome challenges and enhance the effectiveness of its school-based food production initiatives.
- (5) The proposed school-based food production sustainability plan be implemented

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