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Research Article

Gulayan Sa Paaralan (School Garden) Program Coordinators Production Practices: Basis for Capacity-Building Program

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ABSTRACT

Malnutrition is a pressing concern in the Philippines, and the Gulayan sa Paaralan Program (GPP) was initiated to combat this issue. This study aimed to investigate the production techniques employed by GPP coordinators in their various school gardens in connection with the school-based feeding program. The study employed a descriptive survey research design and collected data through a survey questionnaire administered to 49 GPP coordinators in the Municipality of Cawayan. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to analyze the collected data. The findings showed that the majority of GPP coordinators utilized organic fertilizers in their school gardens, and the most commonly grown vegetables were pechay, tomatoes, and eggplants. Nevertheless, the coordinators faced several challenges, including managing pests and diseases, and procuring sufficient resources such as water, labor, and tools. The study recommends training GPP coordinators on good agricultural practices, establishing a community-managed school garden system, and allocating adequate resources for the program's sustainability to address these challenges. The study's results demonstrate that the successful implementation of GPP in schools can lead to increased vegetable output and the eradication of malnourished children in schools. As a result, supporting and strengthening the GPP program is critical to combating malnutrition in the Philippines. The study's findings provide valuable insights for policymakers and stakeholders interested in developing and improving the GPP program. Overall, this study serves as a foundation for future research and interventions aimed at reducing malnutrition and improving food security in the Philippines.

Keywords*: Agricultural practices, Gulayan sa paaralan program coordinator, Malnutrition, School-based feeding program*

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Introduction

Malnutrition has become a pressing issue globally, with an increase in prevalence exacerbated by the COVID-19 pandemic. The Food and Agriculture Organization (FAO) reports that hunger affects an average of 768 million people worldwide, with undernourishment rising from 8.4% in 2014 to 9.9% in 2020 (FAO, 2021). Southeast Asia alone has 3.4 million severely wasting children and 4.2 million overweight children (UNICEF, WHO, World Bank, 2022). In the Philippines, malnutrition remains a critical problem, with 29% of children under the age of five suffering from stunting in 2019 (World Bank, 2021). Malnutrition-related deaths also affect Filipino children, with 3% dying before reaching the age of five (UNICEF, 2015). The Bicol area in the Philippines has reported high levels of underweight, stunted, and wasted children, with 40% of children under five being stunted (World Bank, 2021). The cost of malnutrition to the country is estimated at 3% of GDP or $328 billion per year, with stunted individuals earning less in the future (Buckley, 2019).

To address malnutrition, the Department of Education launched the Gulayan sa Paaralan Program (GPP), which requires schools to allocate at least 200 square meters of land for school gardens. The program aims to supply schools with nutritious vegetables for school-based feeding programs (DepEd Memo No. 223, 2016). However, the implementation of GPP has been challenging for coordinators in Cawayan, with sustainability issues affecting the vegetable supply for feeding programs. Without proper implementation, malnutrition among students may not be effectively addressed. Therefore, this study aimed to investigate the production techniques used by GPP coordinators in Cawayan's schools and suggest suitable interventions to improve the program's administration.

It is essential to promote vegetable production and consumption among students to ensure sufficient nourishment and brighter futures for children (World Bank, 2021). By monitoring and implementing good agricultural techniques, GPP coordinators can create an abundant crop to sustain feeding programs and benefit impoverished students. The effectiveness of GPP implementation in schools can be linked to increased vegetable output and the eradication of malnutrition among students.

Methodology

Setting

The research was conducted in Cawayan, Masbate, which is comprised of 42 elementary and 7 secondary public schools. The elementary schools were divided into two districts, the east with 24 schools and the west with 18 schools. A map of Cawayan showing the schools under study is presented in Figure 1.

Figure 1. Map of Cawayan showing the schools under study

Sampling, Data Collection, and Analysis

The study's respondents were 42 GPP coordinators from the elementary schools and 7 GPP coordinators from the secondary schools. Of the 42 elementary coordinators and 7 secondary coordinators invited to participate in the study, six primary and two secondary coordinators did not respond. Given the pandemic,

the primary data were collected through an internet survey form. The survey instrument used in this study was adopted from Cubelo (2016). This instrument was chosen due to its proven reliability and validity in previous research studies. The researchers informed the respondents of the study's objective and assured them that the data would be confidential. The e-survey questionnaire was delivered to the respondents through email and instant messaging. The GPP coordinators' pre-planting, planting, and post-harvest production techniques were collected and analyzed using descriptive statistics such as frequency, percentage, mean, and standard deviation.

Results and Discussion

Demographic profile of the gulayan sa paaralan program coordinators

The findings of this study (Table 1) show that the majority of GPP coordinators in Cawayan public schools are females, which is consistent with the general trend of female domination in the teaching profession (Dhal, 2022). Female coordinators may have better communication and nurturing skills, which can be advantageous in motivating and engaging students in the program. However, it is also important to ensure that male coordinators are given equal opportunities and support to participate in the program. The high proportion of coordinators who are graduates of education programs reflects the focus of the GPP on incorporating vegetable gardening into the school curriculum. However, the presence of agricultural graduates as coordinators in secondary schools can provide valuable expertise and support for students who may wish to pursue agricultural careers in the future. This highlights the need for a diverse range of skills and knowledge among coordinators to effectively implement the program.

Table 1. Demographic profile of GPP coordinators in public schools of Cawayan

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Sex								
Female	18	82	6	43	3	60	27	62
Male	4	18	8	57	2	40	14	38
Marital Status								
Married	15	68	8	57	4	80	27	68
Single	6	27	6	43	1	20	13	30
Widow/er	1	5	0	0	0	0	1	2
Educational Background								
BEED	21	95	13	93	0	0	34	63
BSED	0	0	0	0	1	20	1	7
BSA-Ag.Ed.	1	5	1	7	2	40	4	17
BSTE-MT	0	0	0	0	1	20	1	7
Business Administration	0	0	0	0	1	20	1	7
Length of Service as Coordinator (in years)								
0-1 year	8	36	6	43	1	7	15	29
2-3 years	7	32	5	36	0	0	12	23
4-5 years	6	27	1	7	2	14	9	16
Above 5 years	1	5	2	14	2	14	5	11
With National Certificate (NC)								
No	22	100	13	93	2	14	37	90
Yes	0	0	1	7	3	21	4	10

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Attendance to agriculture related trainings/seminars								
No	9	41	9	64	2	14	20	49
Yes	13	59	5	36	3	21	21	51

The low percentage of coordinators with NC related to agriculture suggests a need for more training and certification programs for coordinators to enhance their knowledge and skills in vegetable production. This is consistent with the recommendation of a study by Codilla & Cubillas (2022) that continuous training and capacity building should be provided to GPP implementers to ensure program sustainability. The attendance of over half of the coordinators to agriculture-related trainings and seminars indicates a positive attitude towards learning and improvement. It is important to continue providing opportunities for coordinators to attend such events to enhance their knowledge and skills, and to ensure that the program is implemented effectively and sustainably.

Figure 2 depicts the common vegetables grown in the gulayan sa paaralan. The most popular vegetable cultivated in the gulayan sa paaralan is eggplant (66%), whereas basil and radish (2%).

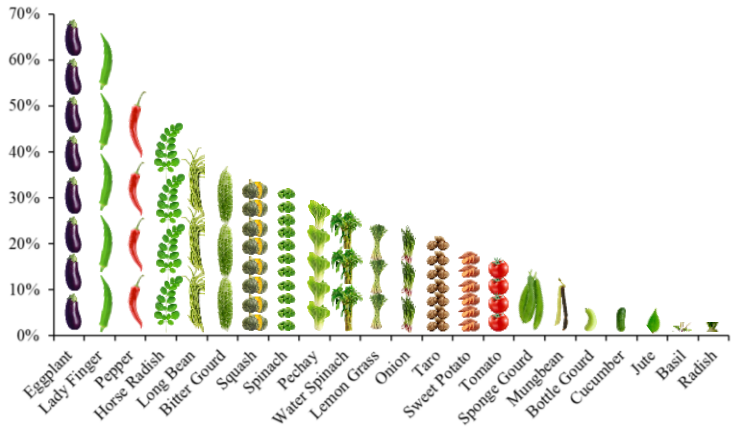

Figure. 2. Vegetable planted in the gulayan sa paaralan

Overall, the demographic profile of GPP coordinators in Cawayan public schools highlights the need for a diverse range of skills and knowledge among coordinators, as well as continuous training and support to ensure program effectiveness and sustainability.

School profile and stakeholders' participation in gulayan sa paaralan

The school profile and stakeholder participation in Gulayan sa Paaralan can be analyzed using enrollment statistics, land acreage, water sources, and student and parent engagement. According to DepEd Memorandum 223, 2016, 73% of schools meet the 200-square-meter threshold for land space. However, some schools in the east and west districts, as well as one senior school, do not meet the land requirement. This can be a challenge for the implementation of gulayan sa paaralan, which requires a certain amount of land for planting vegetables. The majority of schools (57%) rely on deep wells for gulayan sa paaralan water, while 43% rely on rain. However, those schools without a consistent source of water face a significant challenge in maintaining their school gardens, as plants require a substantial amount of water to grow (Beery, 2012).

In terms of enrollment statistics, 48% of schools have enrollments ranging from 119-

535, while around 18% of schools have enrollments ranging from 1,786-2,204. The participation rate of students in gulayan sa paaralan is high, with 79% of enrolled students in public schools participating. Grades 4-6 engage in gulayan sa paaralan in elementary, while all junior and senior high school students participate in secondary. However, only 36% of parents participate in gulayan sa paaralan, and the majority of them are members of the 4Ps. This indicates a need to encourage more parents to participate in the program to promote a collaborative effort between the school and the community in sustaining and maintaining the school gardens.

Table 2. School profile and stakeholders' participation in gulayan sa paaralan

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Enrolment Data								
119-535	19	86	8	57	0	0	27	48
536-952	3	14	4	29	2	40	9	28
953-1369	0	0	0	0	1	20	1	7
1370-1786	0	0	0	0	0	0	0	0
1786-2204	0	0	2	14	2	40	4	18
Land area of gulayan sa paaralang (sq.m.)								
below 200	5	23	2	14	1	20	8	19
200-449	16	73	12	86	3	60	31	73
500-959	1	5	0	0	0	0	1	2
960-1419	0	0	0	0	0	0	0	0
1420-1879	0	0	0	0	0	0	0	0
1880 above	0	0	0	0	1	20	1	7
Sources of water for gulayan sa paaralan								
Rainfed	7	32	7	50	3	60	17	47
Deep well	15	68	7	50	2	40	24	53
Students' Participation								
40-391	22	100	13	93	4	80	39	91
391-743	0	0	0	0	0	0	0	0
744-1095	0	0	0	0	0	0	0	0
1096-1447	0	0	0	0	0	0	0	0
1448-1800	0	0	1	7	1	20	2	9
Parents' Participation								
20-195	20	91	9	64	4	80	33	78
196-351	2	9	5	36	0	0	7	15
352-507	0	0	0	0	0	0	0	0
508-663	0	0	0	0	0	0	0	0
664-820	0	0	0	0	1	20	1	7

In conclusion, the school profile and stakeholder participation in gulayan sa paaralan provide essential insights into the challenges and opportunities for the program's implementation. Schools must have adequate land space and a consistent source of water to sustain the school gardens. Encouraging more parent participation can lead to a collaborative effort in promoting healthy eating habits and sustainable agriculture in the community.

Production practices of gulayan sa paaralan program coordinators

The pre-planting activities utilized by the coordinators of the Gulayan sa Paaralan Program are essential in ensuring the success of

the program. In Table 3, the planting material selection, sources, and cropping per year are shown as important factors in the pre-planting processes (Ibañez et al., 2022). Based on the data gathered, the majority of the coordinators (71%) utilized hybrid seeds in their production, while 29% still used inbred seeds (Ficiciyan, et al., 2021). This finding is significant since hybrid varieties provide higher yields than inbred kinds, and if all coordinators adopted hybrid types, the sustainability of the vegetable feeding program would be very possible.

Moreover, the sources of seed or planting materials used by the coordinators were diverse, with 32% purchasing from agrivet shops in their area, 26% utilizing the previous crop as planting materials, and 25% using planting materials provided by the Department of Agriculture (Ibañez et al., 2022). This shows that the coordinators are resourceful and employ different strategies to obtain planting materials for their school gardens. In terms of cropping per year, the study found that 52% of the coordinators planted only once a year, while others (28%) planted twice a year and 21% planted all year (Ibañez et al., 2022). This finding is similar to the study conducted by Ibañez et al. (2022) that revealed the majority of the coordinators planting only once a year. However, it is important to note that planting twice a year or all year can lead to higher vegetable production and supply for the feeding program.

Table 3. Gulayan sa paaralan pre-planting practices

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Variety of vegetable planted								
Inbreed	7	32	5	36	1	20	13	29
Hybrid	15	68	9	64	4	80	28	71
Source of planting materials								
Bought	6	0	5	36	3	60	14	32
Given By DA	9	27	4	29	1	20	14	25
Own, from previous planting	7	23	5	36	1	20	13	26
Cropping cycle per year								
Once	6	32	6	43	4	80	16	52
Twice	9	27	5	36	1	20	15	28
Throughout the year	7	41	3	21	0	0	10	21

In conclusion, the pre-planting activities of Gulayan sa Paaralan Program coordinators, such as planting material selection, sources, and cropping per year, are crucial to the success and sustainability of the program. It is recommended that coordinators adopt hybrid seeds to increase vegetable yield, explore different sources of planting materials, and consider planting twice a year or all year to boost vegetable production.

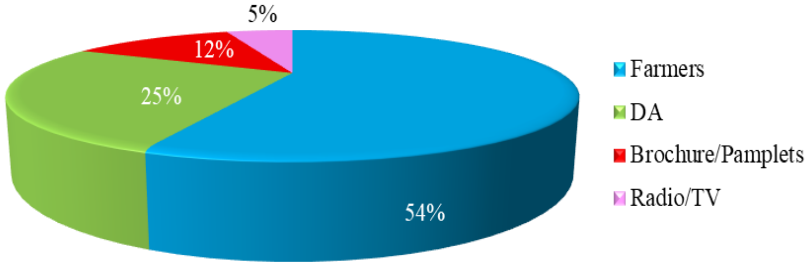

Figure 3: Sources of information of the GPP coordinators

The Gulayan sa Paaralan program is a joint initiative of the Departments of Education and Agriculture, aimed at reducing poverty and addressing malnutrition in the Philippines. The success of this program largely depends on the effective implementation of school gardens by program coordinators. However, the role of the Department of Agriculture in providing support and guidance to coordinators has not been fully realized. As shown in Figure 3, farmers are the primary source of agricultural information for coordinators, followed by the Department of Agriculture, brochures/pamphlets, and radio/TV. This suggests that the DA is not effectively providing the necessary agricultural information to coordinators.

To ensure the success of the Gulayan sa Paaralan program, it is essential that the DA plays a more active role in monitoring and assisting program implementers. The DA has the expertise and experience in all aspects of crop or plant stages, and their guidance can help coordinators in improving their production techniques and ensuring a sustainable vegetable supply for school-based feeding programs. Therefore, it is recommended that the Department of Agriculture provide regular training and guidance to Gulayan sa Paaralan coordinators. This can be done through workshops, seminars, and other capacity-building activities. Additionally, the DA can provide technical assistance in soil analysis, crop selection, and pest management, among other areas. By doing so, the DA can help ensure the success of the Gulayan sa Paaralan program in addressing malnutrition and reducing poverty in the Philippines.

Table 4. Gulayan sa paaralan land preparation and method of establishment

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Implement/tools used for land preparation								
Dull bolo	20	91	10	71	4	80	34	81
Carabao drawn implements	2	9	1	7	1	20	4	12
Pick mattock	0	0	3	22	4	80	7	34
No. of weeks for land preparation before planting								
1 week	7	32	2	14	1	20	10	22
2 weeks	10	45	4	29	4	80	18	51
3 weeks	5	23	8	57	0	0	13	27
Method of vegetable establishment								
Direct Seeding	13	59	7	50	2	40	22	50
Transplanting	9	41	7	50	3	60	19	50

The success of any agricultural program depends largely on the proper implementation of land preparation, including the tools used, the number of weeks allotted for the process, and the techniques employed. In the case of the Gulayan sa Paaralan Program (GPP) in Cawayan, the majority of coordinators (81%) used dull bolos for land preparation, which can be inefficient and cause delays in planting. Moreover, only 27% of the coordinators followed the recommended three to four weeks of land preparation, which could negatively impact the growth and yield of crops.

In terms of crop setup, half (50%) of the coordinators used direct sowing and transplanting, which may not be suitable for small-seeded crops, such as those planted in the GPP. The recommended planting principle is to seed small seeds in the nursery and transplant them later, while larger seeds can be sown directly in the field. Failing to follow this principle could result in poor crop establishment and reduced yield. To address these issues, interventions should be implemented to educate and train GPP coordinators on proper land preparation techniques, including the use of appropriate

tools and adhering to the recommended number of weeks. Furthermore, coordinators should be educated on the planting principle and the appropriate techniques for different crop types to ensure maximum yield and efficient crop establishment. By providing the necessary knowledge and skills, the GPP in Cawayan can become a sustainable program that contributes to addressing malnutrition among students.

Table 5. Gulayan sa paaralan program coordinators fertilizer management

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Schools applying fertilizers								
Yes	20	91	9	64	4	80	33	78
No	2	9	5	22	1	20	8	17
Type of fertilizer Applied								
Organic/natural	4	18	14	100	3	60	21	59
Mixed (Synthetic and Organic)	18	82	0	0	2	40	20	41
Type of organic/natural fertilizer used								
Manure	17	77	12	86	5	100	34	88
Vermi cast	5	23	2	22	0	0	7	15
Types of synthetic fertilizers used								
Ammonium Sulfate (21-0-0)	1	25	0	0	0	0	1	14
Complete (14-14-14) bags	1	25	0	0	3	100	4	57
Urea (46-0-0)	2	50	0	0	0	0	2	29

Table 5 presents the results of the study on the use of fertilizers by the Gulayan sa Paaralan Program coordinators. It was found that the majority of coordinators, 78%, used fertilizers for their crops, with 59% using organic fertilizers and 41% using a combination of organic and synthetic fertilizers. However, some schools did not use any fertilizers, with two schools in the east district, five in the west district, and one secondary school not utilizing fertilizers on their planted crops. This finding suggests that there is a need for improvement in terms of the implementation of the Gulayan sa Paaralan Program, particularly in providing support for schools that may have limited resources or knowledge in using fertilizers. The most commonly used organic or natural fertilizers by coordinators were animal manure (88%) and vermicast (15%). These organic fertilizers contain essential nutrients that are important for plant growth and development, including nitrogen, phosphorus, and potassium. Additionally, complete fertilizer was the most popular synthetic fertilizer (57%), followed by urea (29%) and ammonium sulfate (14%). It is important to note that synthetic fertilizers, while effective in promoting plant growth, may also have negative impacts on the environment and human health (Sabry, 2015). Thus, coordinators should consider using more organic fertilizers in their crop fertilization practices.

It is also worth noting that the study found that coordinators did not evaluate or compute the fertilizer based on fertilizer recommendations per plant before applying it. This is a concerning finding as improper use of fertilizers can lead to negative impacts on plant growth and may even harm the environment. Thus, there is a need for training and support for coordinators in terms of proper fertilizer application and monitoring.

In conclusion, the study highlights the need for improved implementation of the Gulayan sa Paaralan Program, particularly in terms of providing support for schools that may have limited resources or knowledge in using fertilizers. Coordinators should also consider using more organic fertilizers in their crop fertilization practices and be trained on proper fertilizer application and monitoring. By doing so,

the program can be more effective in promoting sustainable vegetable production and addressing malnutrition among students in schools.

Table 6. Gulayan sa paaralan weeds, insect-pests, and diseases management

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Weeds as major problem								
No	5	23	2	14	2	40	9	26
Yes	17	77	12	86	3	60	32	74
Methods of controlling weeds								
Herbicide	0	0	1	7	0	0	1	2
Manual weeding	18	82	11	79	5	100	34	87
Mulching	4	18	2	14	0	0	6	11
Insect-pests as major problem								
No	8	36	2	14	1	20	11	23
Yes	14	64	12	86	4	80	30	77
Insect-pests identification								
No	2	9	3	21	1	20	6	17
Yes, all	2	9	1	7	1	20	4	12
Yes, some	18	82	10	71	3	60	31	71
Methods of controlling insect-pests								
Applied pesticides	2	9	3	21	1	20	6	15
Biological control	1	5	0	0	0	0	1	2
Crop Rotation	2	9	1	7	2	40	5	12
Hand picking	17	77	10	71	2	40	29	71
Insecticide used								
Cymbush	1	50	0	0	0	0	1	17
Lannete	0	0	1	33	0	0	1	16
Malathion	0	0	1	33	0	0	1	17
Organic	1	50	1	33	0	0	2	33
Thiodan	0	0	0	0	1	100	1	16
Frequency of insecticide application								
Anytime	1	50	0	0	0	0	1	17
Depend on the attack of pest.	1	50	0	0	0	0	1	17
Once in every planting	0	0	1	33	1	100	2	33
Twice in every planting	0	0	2	67	0	0	2	33
Diseases as major problem								
No	1	50	6	43	2	40	9	44
Yes	1	50	8	57	3	60	12	56
Practice integrated pest management (IPM)								
No	19	86	13	93	4	80	36	86
Yes	9	41	1	7	1	20	11	23

Crop protection is a critical aspect in agriculture as it contributes to crop or yield decrease. Weeds, insect pests, and diseases are among the factors that contribute to agricultural yield reductions (Lantican, 2001). Neglecting these pests can lead to a 70% loss of harvest, with 30% of the loss attributed to weeds, 23% to animal pests, and 17% to pathogens or diseases (Gordon, n.d.). Therefore, the effective management of pests and diseases is

crucial in the implementation of the Department of Education's Gulayan sa Paaralan Project. Table 6 highlights the severity of pest and disease infestations in the GPP of various schools in Cawayan and how they are managed.

Weeds are a significant issue in the GPP of several schools in Cawayan, with 74% of GPP coordinators reporting them as a significant problem in their gardens, including both primary and secondary schools in both the east and west districts. Hand weeding is the most common method used by coordinators to address the weed problem, although it is laborious and time-consuming, particularly since the coordinator and students have classes. However, some GPP coordinators have adopted modern and effective weed management strategies, such as the use of mulching, which is exclusively used in primary schools and not in senior schools.

Insect pests are a major concern in the Gulayan sa Paaralan Program (GPP) as they can cause a reduction in productivity by up to 23% if left unchecked (Manosathiyadevan et al., 2015). According to the majority of teachers (77%), insect pests are a big problem in their school garden. It is important to identify insect pests in order to combat them effectively. However, only 12% of instructors can name all insect pests, 71% can identify some of the pests, and 17% cannot identify insect pests. This lack of knowledge about insect pests can result in inadequate pest management strategies (Lara &Saldivar, 2016).

To mitigate the harm caused by insect pests, various methods of management are employed by GPP coordinators. The most common approach used by coordinators is hand-picking (71%), which is practiced by both elementary and high school coordinators. Pesticide application, crop rotation, and biological control are also used, with 15%, 12%, and 2%, respectively. Organic pesticides are used by two out of six GPP coordinators, while the others use chemical pesticides such as malathion, lannete, cymbush, and thiodan, which are all used by one coordinator. In terms of frequency, 33% of coordinators apply pesticides twice in every planting, while another 33% apply pesticides once in every planting. However, there are also 17% of coordinators who apply pesticides only when there is a pest attack. It is important to note that the use of chemical pesticides can have negative impacts on human health and the environment (Aktar et al., 2009). Thus, the use of organic pesticides and other sustainable pest management practices should be encouraged. In addition, proper identification of insect pests and regular monitoring can help prevent pest outbreaks and minimize the need for pesticide use (Kumar et al., 2021).

School gardens are an excellent way to promote nutrition and provide fresh produce for school-based feeding programs. However, the effectiveness of school gardens depends on the production techniques used by coordinators. In this study, the prevalence of plant diseases and the use of Integrated Pest Management (IPM) were examined to determine the production techniques used by Gulayan sa Paaralan Program (GPP) coordinators in Cawayan, Masbate. According to the survey conducted in this study, 56% of the coordinators suffer from plant diseases in their field. This high prevalence of diseases can be attributed to several factors, including poor soil quality, lack of crop rotation, and inadequate pest management. Plant diseases can significantly reduce crop yields and quality, and if not addressed promptly, can lead to crop failure. However, it is worth noting that 44% of the coordinators claimed that plant diseases are not a serious concern in their school garden. This can be attributed to the use of good agricultural practices, such as crop rotation and the use of disease-resistant crop varieties. Moreover, the coordinators who reported a lower incidence of plant diseases may have implemented effective pest management practices.

IPM is an effective and sustainable approach to pest management that involves the use of multiple pest management tactics. These tactics include the use of natural enemies, crop rotation, and the use of pest-resistant crop varieties. IPM is a cost-effective approach that reduces the use of pesticides, which can have negative effects on human health and the environment. According to the survey, only 23% of the coordinators use IPM in their school garden. This low uptake of IPM can be attributed to several factors, including a lack of knowledge and awareness of IPM practices, a lack of training

on IPM, and the perceived complexity of implementing IPM.

In conclusion, insect pests pose a significant threat to the productivity of school gardens in the GPP. The lack of knowledge about insect pests among coordinators highlights the need for training and education on pest identification and management. The use of sustainable pest management practices such as hand picking, crop rotation, and biological control, as well as the use of organic pesticides, should be promoted to ensure the health and safety of students and the environment. Also, the prevalence of plant diseases and the use of IPM are essential factors that affect the effectiveness of school gardens in providing fresh produce for school-based feeding programs. The high prevalence of plant diseases and the low uptake of IPM in Cawayan, Masbate, indicate that interventions are needed to improve production techniques and address plant diseases effectively. The implementation of good agricultural practices and the training of coordinators on IPM are essential steps to ensure the sustainability and effectiveness of school gardens.

Table 7. Gulayan sa Paaralan harvesting and post-harvest practices

Variable	East District (n=22)		West District (n=14)		Secondary Schools (n=5)		Total (n=41)	
	F	%	F	%	F	%	F	%
Methods of harvesting the vegetables								
Handpicking	22	100	14	100	5	100	41	100
Practices for harvested vegetables								
Sold as newly harvest	6	27	3	21	2	40	11	27
Used in Feeding Program	16	73	11	79	3	60	30	73
Vegetable buyer								
DepEd Employee	13	59	10	71	4	80	27	70
Outside the school	8	36	4	29	0	0	12	22
Students	1	5	0	0	1	20	2	8
Treatment for rejected vegetables								
Throw	1	5	1	7	1	20	3	7
Turn to compost	21	95	13	93	4	80	38	93
Yield performance								
Average	6	27	4	29	2	40	12	29
Don't know	2	9	4	29	2	40	8	20
Good	3	14	2	13	0	0	5	12
Low	11	50	4	29	1	20	16	39

Harvesting is a critical stage in agriculture, which involves the collection of crops or plant parts for consumption or sale. In the case of school gardens aligned with the school-based feeding program, harvesting plays a crucial role in ensuring the availability of fresh and nutritious vegetables for student meals. According to the data from school garden organizers, all of them collect their crops by hand, implying that there is no use of machinery or equipment in harvesting. The study's findings revealed that 73% of the produce was utilized in the school's feeding program, while the remaining 27% was sold to customers. The proceeds from the sales were used to acquire essential inputs or purchase supplies for the feeding program. The majority of vegetable buyers were teachers from the same school, which accounted for 70%, while 22% were from outside the school, and 8% were students. This indicates that the school gardens not only serve as a source of fresh and nutritious vegetables for the students but also generate income for the school.

However, not all harvested vegetables are in good condition or fit for consumption. The survey showed that almost all (93%) of the school gardens compost their rejected veggies, while the remaining 7% dispose of them. This

implies that there is a conscious effort by the school garden coordinators to manage waste and minimize the environmental impact of their activities. The performance of the school gardens was also evaluated using the most recent crop. The study found that 33% of the school gardens had poor yield performance, 29% had an average yield, and 20% did not know the performance of their yield. Only a small percentage (12%) had high yield performance. This indicates that there is a need for improved farming practices, including the use of suitable crop varieties, proper soil management, and pest and disease control measures, to enhance yield performance and ensure the sustainability of the school garden initiative.

In conclusion, the findings of the study demonstrate that school gardens aligned with the school-based feeding program can serve as a source of fresh and nutritious vegetables for students while generating income for the school. However, there is a need for improved farming practices, waste management, and pest and disease control measures to enhance yield performance and ensure the sustainability of the initiative.

Problems encountered of the coordinators in the implementation of GPP in schools

The implementation of the Gulayan sa Paaralan Program (GPP) in schools has the potential to improve the nutritional status of students and address malnutrition in the Philippines. However, the success of the program is dependent on the effective execution by GPP coordinators. In this section, we discuss the problems encountered by coordinators in implementing GPP in schools.

Seed and Planting Materials

One of the primary issues faced by GPP coordinators is the availability and quality of seed and planting materials. According to a survey conducted among GPP coordinators, 41% reported that the planting material is not always accessible locally, 23% mentioned that the quality is not assured, and 22% stated that they lack knowledge on acceptable types. This lack of access to quality planting materials can adversely affect vegetable production, leading to poor yield and low-quality vegetables (Bertin et al., 2020).

Fertilizer Issues

Another issue faced by GPP coordinators is the availability and proper use of fertilizers. The survey found that fertilizer issues were prevalent among GPP coordinators, with the first issue being the availability of fertilizer locally. The lack of information on the proper application of fertilizer and the high cost of fertilizer were also reported as major issues. Proper fertilization is crucial in vegetable production, and the absence of appropriate fertilization techniques can significantly reduce crop yields (Velza et al., 2022).

Pesticide Problems

GPP coordinators also face problems with pesticides, with 37% reporting difficulties in this area. The survey found that 35% of coordinators lack knowledge of correct pesticide application, while 28% cite high prices as a significant problem. Misuse of pesticides can cause adverse effects on human health and the environment. Therefore, proper pesticide use and management are crucial in vegetable production (Biradar et al., 2020).

Student Engagement

Engaging students in school gardens is another challenge faced by GPP coordinators. The survey revealed that approximately 73% of GPP coordinators reported a lack of trained students to do school gardens, and 27% stated that students lack a love for farming/gardening. Lack of student engagement can result in low yields and poor maintenance of school gardens. Engaging students in gardening activities can increase their interest and knowledge of gardening and promote healthy eating habits (Velza et al., 2022).

Conclusion

The implementation of the Gulayan sa Paaralan Program (GPP) is a vital project in addressing the malnutrition issue in the Philippines, particularly in areas where malnutrition is prevalent, such as the Municipality of Cawayan. However, GPP coordinators encounter numerous problems, including difficulties

in acquiring quality seed/planting materials, fertilizer, pesticides, and student engagement. Addressing these issues is crucial in ensuring the sustainability and success of the GPP in schools.

Recommendations

Based on the findings of this study, it is recommended that the government and local authorities provide adequate support to GPP coordinators in terms of seed/planting materials, fertilizers, and pesticides. It is essential to provide them with training on appropriate types of planting materials, how to apply fertilizers, and the safe and proper use of pesticides. Providing them with financial assistance and subsidies for transportation costs can also help ease the burden of acquiring these essential resources. It is also crucial to encourage and promote student engagement in the school garden program by providing them with proper training and incentives, such as recognition and rewards for their contributions. Lastly, a continuous monitoring and evaluation system must be put in place to ensure the sustainability and effectiveness of the GPP program. This can help identify areas of improvement and provide timely interventions to ensure that the program's objectives are met. By addressing these recommendations, the GPP program can be successful in its mission to alleviate malnutrition among Filipino schoolchildren and improve their overall health and well-being.

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