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Research Article

Status of Gulayan Sa Paaralan (School Garden) Program in Public Elementary and Secondary Schools of Cawayan, Masbate, Philippines: Basis for Extension Activities

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ABSTRACT

The Department of Education implemented gulayan sa paaralan (school garden) to assist the government in reducing malnutrition in the country. DEBESMSCAT-Cawayan Campus assessed the state of gulayan sa paaralan (school garden) of all public schools in Cawayan, Masbate as part of the evaluation technique to establish the suitable and needed extension services to be delivered. The study employed a descriptive research approach and purposive sampling. In the study, a structured survey questionnaire was used to collect data on the status of the gulayan sa paaralan (school garden) program in the schools. Data showed that the gulayan sa paaralan (school garden) initiative had not yet been adequately implemented for a variety of reasons. Schools utilized bolo to prepare the land, which took several months to complete. Planting supplies and other inputs were unavailable at all times, causing the output to be delayed. The lack of Department of Agriculture assistance for inputs, as well as the lack of training/seminars related to the gulayan sa paaralan (school garden) program, are factors that impede the program's implementation and sustainability. Since school heads did not appropriate funding from the MOOE, all coordinators were obliged to pull money from their purses to fund the gulayan sa paaralan (school garden) initiative. Due to low vegetable output, the gulayan sa paaralan (school garden) program in Cawayan public schools does not make a substantial contribution to combating school malnutrition. The implementing agency should explore a holistic strategy for GPP implementation in schools, with close collaboration with related agencies, stakeholders, and religious monitoring of the program should be strictly observed. The capacity of the school heads and coordinators to lead is a key element to the program's success.

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Introduction

Malnutrition is a public health issue that demands prompt action. Various interventions were presented by the government and non-government organizations to relieve malnutrition in the country. Malnutrition is an abnormal physiological state characterized by energy, protein, and/or other nutritional deficits, excesses, or imbalances (Mother and Child Nutrition, 2019). An estimated 41 million children under the age of five are overweight or obese, with an additional 159 million stunted and 50 million wasted (WHO, 2021). Malnutrition is the most serious public health problem in the Philippines, which has 3.6 million stunted children and ranks ninth among nations with the greatest incidence of stunting and tenth among countries with the highest prevalence of wasting (Save the Children, 2016). Malnutrition is one of the issues confronting the Department of Education (DepEd). Malnutrition kills 95 children in the Philippines, and 3% of Filipino children die before reaching the age of five (UNICEF,). According to UNICEF, undernutrition is the most serious public health problem in the Bicol area, with a high proportion of underweight (24.6%), stunting (39.8%), and wasting (7.4%). A similar study was made by Save the Children (2016), which discovered that Bicol had the highest (39.8%) frequency of stunted children. Cawayan placed 14th out of 21 municipalities in Masbate province, with a malnutrition prevalence of 4.9%. (National Nutrition Council, 2019). One of the repercussions of hunger on kids is their inability to deal with the learning activities that their instructor is undertaking. Stunted children had poorer cognitive test scores, delayed enrollment, increased absenteeism, and more class repetition in their first two years of life than non-stunted children (Mother and Child Nutrition, 2019).

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.

Both public elementary and secondary schools in the Municipality of Cawayan are having trouble implementing the gulayan sa paaralan (school garden) Program (GPP). According to DepED, the major goal of this initiative is to alleviate the malnutrition problem among students in schools. Malnutrition is one of the health issues confronting not just the school, but the entire country. Schools play an important role in lowering the malnutrition rate among students because the DepED Memo No. 293, series of 2007 requires schools to establish a school garden planted with various nutritious plants so that there is a continuous supply of vegetables during the school-based feeding program. With the difficulties encountered by Cawayan's schools, malnutrition may not be addressed. DEBESMSCAT-Cawayan Campus had some difficulties determining what specific intervention might be done to successfully implement the GPP in public schools, notably in Cawayan, to address malnutrition as a frequent problem in schools.

The study's objectives are as follows: (1) examine the school's background about the program; (2) identify the practices in the gulayan sa paaralan (school garden) program of the different schools; (3) determine the production performance of each gulayan sa paaralan (school garden) program; (4) identify the constraints in the implementation of the gulayan sa paaralan (school garden) program, and (5) determine the support and services

they received from various organizations; (6) create extension program as an intervention.

Methods

Respondents

The 42 elementary and seven (7) secondary Gulayan sa Paaralan (School Garden) Program coordinators of Cawayan, Masbate, Philippines are the respondents of this study (15 males, 26 females). There are 8 unresponsive public schools on the questionnaires being sent to them.

Sampling, Data Collection and Analysis

The whole population of Cawayan public elementary and secondary GPP coordinators served as the subject of the study to whom the researchers would like to generalize. A descriptive research design was used in this study. Due to the pandemic, an electronic survey questionnaire was used to collect the data. The e-survey questionnaire was sent to the respondents via e-mail and messenger. The researchers informed first the respondents about the purpose of the survey and how the data will be kept anonymous and confidential. This research used frequency count and mean and percentage as statistical tools in the computation of the data.

Results and Discussion

Background Analysis of Gulayan sa Paaralan Program Coordinators

Table 1 shows that female coordinators (66%) outnumber male coordinators (34%). This may be linked to women today being more empowered and holding distinctive abilities, which, when capitalized, transformed them into powerful and successful human capital (Sohail, 2014). The majority of coordinators (66%) were married, followed by a single (32%), and widow/er (2%). When it comes to working productivity, married people outperformed unmarried people (Mehay, et al. 2005). In terms of educational attainment, the majority (93%) of the coordinators were education graduates with various fields of specialization, while just 7% were agriculture-related course graduates. Since the program is about farming in schools and everyone has a great love for this effort, it is practical to appoint a person with agricultural knowledge and abilities for the project's success. According to the data, the majority of coordinators (68%) were new to their positions. Some (22%) worked as coordinators at their respective schools for 4 to 6 years, while others (10%) worked for a longer time. According to the division coordinators' statements, one of their challenges in GPP implementation was transferring coordinators to their home-based schools which is why they were compelled to replace or assign new personnel to handle the program. Coordinators must get further knowledge and skills in agricultural methods. However, it was discovered that 90% of the coordinators did not have agricultural national certificates, and just 10% of them had NCs given by Technical Education and Skills Development Authority (TESDA). Moreover, more than half (51%) of the coordinators attended agriculture-related training/seminars, fewer than half (37%) were unable to attend, and 12% went very sometimes. Attending seminars allows a person to attain work goals, remain up to speed on new processes and procedures related to their employment, and leverage a greater wealth of professional information and experience in completing their tasks (Chukwu, 2017).

Table 1. Gulayan sa paaralan program coordinators background

Background	Frequency	Percentage
Gender		
Female	27	66
Male	14	34
Civil Status		
Married	27	66
Single	13	32
Widow/er	1	2

Background	Frequency	Percentage
Educational Attainment		
BEED	34	83
BSA-Ag.Ed.	3	7
BSED	3	5
BSTE-ME	3	5
Length of Service as GPP Coordinator (Yrs.)		
0-3	28	68
4-6	9	22
7-9	2	5
10 and above	2	5
With National Certificate (NC)		
No	37	90
Yes	4	10
Seminars/training Participation		
Yes	21	51
No	15	37
Sometimes	5	12

Gulayan sa Paaralan Program Background

Data on the school population, stakeholder participation, vegetables grown, and GPP land area were gathered and evaluated to assess the status of the GPP implementation (Table 2). The majority (66%) of Cawayan public schools have a student population of 100 to 500 pupils, 24% have a student population of 501-1000, 1% have a population of 1501 to 2000, and 3% have a population of more than 2000. The determination of the school population is an important step in examining stakeholders' engagement in the GPP. Stakeholders, whether internal or external, play a significant role in the school as school administrators' partners in developing plans, executing, and monitoring school initiatives and programs such as GPP for the welfare of the school community (Pelayo, 2018). In terms of stakeholder participation, 31 out of 41 Cawayan's public schools had 26-50% of their entire student population engage in the GPP implementation. Some (10%) schools have active student engagement rates of 51-75%, while others (7%) have participation rates of 75-100% of their student body. The majority of participants (71%) in primary schools are in grades 4-6, which can be linked to the fact that these year levels contain curricula in Technology and Livelihood Education. In secondary schools, grade 9-10 (17%) year levels are actively interested in gulayan sa paaralan (school garden), with senior high school students accounting for 10% of engagement (Grade 11-12). External stakeholders help to ensure the success of school initiatives such as the gulayan sa paaralan (school garden) program. Parents' engagement is highly valued by the school administration, and they have received awards and other types of recognition for their efforts. In Cawayan's public schools, where there are 300 pupils, 285 (95%) of their parents participate religiously in GPP activities. This engagement of parents is due to the current Department of Social Welfare and Development (DSWD) municipal link policy mandating all parents to attend all school activities. Failure to participate in school activities will result in a decrease in their monthly payments.

Land for planting is one of the program's core prerequisites. DepEd, through their concerned divisions, required all schools to have an area of 200m^2 allotted for their school garden. Most (85%) of public schools in Cawayan complied with this requirement, and some (4%) schools have a land area that is larger than what is required, measuring approximately 301 m^2 to 900 m^2. Out of 22 vegetables grown in different Cawayan schools, eggplant was the most popular (66%), followed by ladyfingers (63%), pepper (51%), horse radish (44%), long bean (37%), bitter gourd (34%), squash (32%), spinach (29%), pechay (27%), water spinach (24%) lemon grass and onion (22%), taro (20%), sweet potato (17%),

tomato (15%), sponge gourd (12%), mungbean (10%), bottle gourd. Moreover, more than half of the schools (56%) have or utilize a calendar of activities, whereas 27% do not have a calendar of activities and 17% use it seldom. A calendar of activities allows a person to manage all of his obligations and monitor his availability (Walburg, 2017).

Table 2. Gulayan sa paaralan program background

Background	Frequency	Percentage
Number of Students in the School		
100-500	27	66
501-1000	10	24
1001-1500	0	0
1501-2000	1	1
2001-2500	3	3
Number of Students involved in the Gulayan sa Paaralan Program		
1-25%	3	7
26-50%	31	76
51-75%	4	10
76-100%	3	7
Grade level of the students involved in the Gulayan sa Paaralan Program		
Grade 1-3	1	2
Grade 4-6	29	71
Junior High	7	17
Senior High	4	10
Number of Parents involved in Gulayan sa paaralan program		
1-300	39	95
301-600	1	2
601-900	1	2
The total land area of the gulayan sa paaralan (school garden) program? (In square meters)		
100-500	35	85
501-1000	4	10
1001-1500	0	0
1501-2000	1	2
2001 and above	1	2
Vegetables planted		
Eggplant	27	66
Ladyfingers	26	63
Pepper	21	51
Horse Radish	18	44
Long bean	15	37
Bitter gourd	14	34
Squash	13	32
Spinach	12	29
Pechay	11	27
Water Spinach	10	24
Lemon Grass	9	22
Onion	9	22

Background	Frequency	Percentage
Taro	8	20
Sweet potato	7	17
Tomato	6	15
Sponge Gourd	5	12
Mungbean	4	10
Bottle gourd	2	5
Cucumber	2	5
Jute	2	5
Basil	1	2
Radish	1	2
Percentage of schools with Calendar of Activities		
Yes		56
No		27
Sometimes		17

Analysis of Gulayan sa Paaralan Production Practices

Table 3 shows the baseline statistics on gulayan sa paaralan (school garden) production techniques. According to the statistics, 25 of the 41 public schools in Cawayan have a deep well as their primary source of water for vegetable production, while 16 schools (39%) rely on alternate sources such as rainwater and others. The results suggest that the majority of schools regard the source of water in the gulayan sa paaralan to be an issue. This condition is concerning in this area of the project since there are occasions when there is no rain for 2-3 weeks in the municipality of Cawayan. Water is particularly important in agricultural production since, without it, the process of photosynthesis would not operate correctly because plants require water for the stated process (Rimando, 2001). In terms of varietal selection for planting, 17 (41%) schools selected hybrid seeds, while 24 (59%) picked good seeds (seeds from the previous planting). The first step toward a successful harvest is selecting the variety of seeds to be sown. When compared to good seeds, hybrid seeds can yield more (given that all other factors are equal). On the other hand, the source of seeds planted in the GPP is as follows: owned from previous planting (31%), donated by DA (34%), and bought (34%). According to DepEd Memorandum 95, series of 2018, a school garden was built to ensure a constant supply of vegetables for school food, especially school-based feeding. However, most schools (39%) only planted once each year, while just 24% planted all year. As a result, the sustainability of vegetable supply in the school-based feeding program is difficult to establish.

Table 3. Gulayan sa paaralan production practices background

Background	Frequency	Percentage
Source Of Water		
Deep well	25	61
Collected from the rain	8	20
Rainfall	7	17
Others	1	2
A problem in the water supply		
Yes	24	59
No	8	20
Sometimes	9	22
Variety of Vegetable Planted		
Hybrid	17	41

Background	Frequency	Percentage
Good Seed	24	59
Source of Seeds		
Own, from the previous planting	13	32
Given By DA	14	34
Bought	14	34
Cropping Cycle per year		
Once	16	39
Twice	15	37
Throughout the year	10	24

The data in table 4 is the result of GPP land preparation techniques. According to data, 35 schools, or 85% of the schools in GPP Cawayan, employed Bolo for land preparation, while 7% used pick mattocks and carabao-drawn equipment. Good agricultural practices recommend that well-prepared soil have a depth of 9-15 cm for improved soil qualities (Lantican, 2001). In terms of the number of weeks required for land preparation, 44% of schools prepare their land two weeks before plating, 37% three weeks, and 20% one week. Scientifically, most GPPs do not adhere to the conventional land preparation before the transplanting time of three weeks. Finally, considering the method of vegetable establishment, 54% of 22 schools used direct sowing for their GPP.

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

	Frequency	Percentage
Implement/tools used for land preparation		
Bolo	35	85
Pick mattock	3	7
Carabao drawn implements	3	7
No. of Weeks for land preparation before planting		
2 weeks	18	44
3 weeks	15	37
1 week	8	20
Method for vegetable establishment		
Direct Seeding	22	54
Transplanting	19	46

Table 5 shows the GPP fertilizer application procedures. The results indicated that 80 percent of the schools in Cawayan used fertilizer, whereas 20 percent of the schools did not. Fertilizer is a material that is given to the soil to promote soil fertility for crop nutrition, which is critical in good or high production. In terms of fertilizer type, 76% utilized organic fertilizer on their GPP, while 24% used both organic and synthetic fertilizer. For the schools that used organic fertilizer, 83% used manure, and 12% used vermicast. In terms of the number of bags of organic fertilizer applied, 78% applied 0-5 bags, 17% applied 6-10 bags, 2% applied 11-15 bags, and 2% applied 16-20 bags. In terms of synthetic fertilizer, 12% used complete fertilizer (14-14-14), 7% used urea, and 2% used ammonium sulfate and ammonium phosphate. 37% used 0-5 bags of synthetic fertilizer, whereas 2% applied 6-10 bags. About 37% of schools do not use balance fertilizers, 29% do, and 34% are unsure.

Table 5. Gulayan sa paaralan production practices for fertilizer application

Fertilizer Application	Frequency	Percentage
Schools applying fertilizers		
Yes	33	80
No	8	20
Type of Fertilizer Applied		
Organic	31	76
Mixed (Synthetic and Organic)	10	24
Type of Organic Fertilizer		
Manure	34	83
Vermicast	5	12
No. of bags of organic fertilizers used		
0--5	32	78
6--10	7	17
11--15	1	2
16--20	1	2
Types of synthetic fertilizers used		
Complete (14-14-14)	5	12
Ammonium Phosphate (16-20-0)	1	2
Urea (46-0-0)	3	7
Ammonium Sulfate (21-0-0)	1	2
Others	4	10
Bags of fertilizer applied		
0--5	15	37
6--10	1	2
Schools Applying balanced fertilization		
No	15	37
Yes	12	29
Not Sure	14	34

Pest control is another element influencing GPP production; table 6 contains information on pest management techniques and difficulties in GPP in the Municipality of Cawayan. Weeds are a serious concern in 31 of 41 coordinators' GPPs, or 76%. The majority (83%) of GPP coordinators use traditional or manual weeding to handle their weed problem. 7% employ mulching to inhibit weed development, while 10% utilize unknown methods. Manual weeding is far more time-consuming and costly than purchasing or adopting mulching.

In terms of insect pests, 71% of GPP coordinators stated that insect pests constitute a big concern in their GPP. This is true since bug pests in vegetables are so damaging that they can destroy your harvests. The results also suggest that only 76% of GPP coordinators can identify some insect pests, 15% cannot identify insect pests, and 10% can identify all insect pests. Identifying insect pests in your vegetable production is a step closer to improved output since you can't fight an adversary if you don't know who it is. In terms of insect pest control, 63% used manual picking, 15% used pesticides, 12% used crop rotation, and 2% used biological control. In terms of the type of insecticide employed by the GPP, 8% utilized synthetic pesticides, while 9% used a natural or organic approach to pest management. In terms of pesticide application frequency, 34% do not know how many times they apply, 10% only once, 5% twice, and 2% whenever and if the pest is present.

Furthermore, when it comes to illness incidence, 56% of respondents said diseases are a serious concern in the GPP, 22% said never, and 22% said occasionally. Overall, 66% of GPP coordinators do not practice IPM, 22% are unsure, and 12% do.

Table 6. Gulayan sa paaralan (school garden) production practices for pest management

Pest Management	Frequency	Percentage
Weeds as a major problem		
Yes	31	76
No	10	24
How to Control Weeds		
Manual weeding	34	83
Mulching	3	7
Others	4	10
Insect pests as a major problem		
Sometimes	7	17
Yes	29	71
No	5	12
Coordinators that can identify insect-pest		
Yes, some	31	76
No	6	15
Yes, all	4	10
How to control insect-pest		
Hand-picking	26	63
Crop Rotation	5	12
Applied pesticides	6	15
Biological control	1	2
Others	3	7
Insecticide used		
dishwashing liquid and pepper	1	2
Malathion	1	2
Organic	3	7
CYMBUSH	1	2
Lanette	1	2
Thiodan	1	2
Frequency of insecticide application		
Once	4	10
Anytime	1	2
Twice	2	5
Depend on the attack of the pest.	1	2
Not Sure	14	34
Plant Disease is the major problem		
Sometimes	9	22
Yes	23	56
No	9	22
School Practicing IPM		
Not Sure	9	22
No	27	66
Yes	5	12

The discussion on GPP techniques for harvesting and post-harvest activities is summarized in table 7. According to the study's findings, 98% of respondents (40 out of 41) collect their products by hand. In terms of harvesting time, 49% harvest early in the morning, 34% at any time of day, and 17% late in the afternoon. Harvesting timing is a crucial factor in vegetable farming since it affects the quality of the produce after harvest. The data also reveals

what procedures were used and what was done with the collected crops. Less than half (49%) stated it was utilized for the feeding program, 24% said it was preserved for student use, and 27% said it was sold as freshly gathered. The majority of their vegetable product is purchased by DepEd employees (54%).

Concerning the disposal of rejected food and the leaves of vegetable by-products, 93% of the GPP compost them, 2% burn them, and 5% just toss them away. In terms of yield performance, 71% harvest 0-10kg of vegetables from their GPP, 12% 11-20kg, 7% 31-40kg, and 2% 41-50kg. Finally, 39% of GPPs are dissatisfied with their GPP's yield performance, 32% believe it is average, 10% believe it is good, and 17% are unsure.

Table 7. Gulayan sa paaralan (school garden) production practices for harvesting and post-harvest

Harvesting and Post-harvest Practices	Frequency	Percentage
Harvesting Practices		
Hand Picking	40	98
Others	1	2
Time of the day in harvesting		
Early Morning	20	49
Anytime	14	34
Late Afternoon	7	17
Practices for harvested vegetables	10	24
Put in the storage for students' Consumption		
Sold as newly harvest	11	27
Used in Feeding Program	20	49
Vegetable buyer	4	10
Students		
DepEd Employee	22	54
Others	8	20
Outside the school	7	17
What to do for the rejected vegetables and leaves		
Turn to compost	38	93
Throw	2	5
Burn	1	2
Yield (Kg) per cropping		
0--10	29	71
11--20	5	12
21--30	3	7
31--40	2	5
41--50	1	2
51--60	1	
Perceived Production Performance based on the previous production		
Low	16	39
Average	13	32
Good	4	10
Do not know	7	17

Analysis of Gulayan sa Paaralan (School Garden) Support Services

This research examines and evaluates the GPP's support services. In terms of information sources for GPP, 54% obtained their knowledge from farmers, 15% from the Department of Agriculture, 12% from brochures and booklets, 10% from agricultural

technicians, 5% from radio/TV, and 5% from other sources. For the Department of Agriculture or local government unit support services or programs, 37% got GPP training/seminars, 22% technical information/advice, 20% seeds or plating material, 7% financial help, and 5% fertilizer.

Table 8. Gulayan sa paaralan support services

Background	Frequency	Percentage
Source of Information in Vegetable Production technologies		
Farmers	22	54
Department of Agriculture	6	15
Brochures, pamphlets, etc.	5	12
Extension or Agricultural Technician	4	10
Others	2	5
Radio/TV	2	5
Support services or programs from DA or LGU implemented for Gulayan sa Paaralan		
Training/Seminars	15	37
Technical information/advice	9	22
Seeds or planting materials	8	20
Others	5	12
Financial assistance	3	7
Fertilizer	2	5

Constraints of the Coordinators in the Implementation of GPP in Schools

Challenges are constantly present in every program/project to be formed, and they are occasionally the cause of implementation delays. Table 9 depicted the challenges faced by GPP coordinators in their schools throughout the execution of the Department of Education's gulayan sa paaralan (school garden) program. Plants need nutrients to grow and develop properly, and they may be gotten from the soil. There are around 16 elements in the soil, and both are required by plants in little and large amounts. According to the data, the bulk of the schools (88%) suffered low soil fertility. Soil fertility is critical in delivering essential nutrients for plant development (FAO, 2021). If the school's soil is not fruitful, it is assumed that the collected product will be insufficient to feed the school's malnourished students. Some schools (7%) have drainage issues. Poor drainage in the garden can cause floods, destroying all planted vegetables as well as other important items at the school. One out of every 41 schools had low soil water retention. Water-holding capacity varies according to soil type. The bigger the soil particles, the less capable they are of holding water. Soil health is dependent on the soil's ability to retain a balanced quantity of water to nourish crops and keep soil organic matter alive (ValentBioSciences, 2021). However, just one (1) school did not have soil concerns while planting. When it comes to seed and planting supplies, most (41%) of the schools had trouble obtaining them since they were not accessible in local marketplaces. Some (24%) have little understanding of the appropriate types to plant in their school garden. Others (22%), on the other hand, are concerned about the quality of the seeds/planting materials they acquired from vendors. Four (4) schools complained about the high cost of seeds on the market when they purchased them. When it comes to planting supplies, one (1) school did not define the issue. Establishing a school garden is simple and quick provided inputs such as seeds and planting materials are readily available.

Some inputs, such as fertilizer and insecticides, generated issues for all GPP coordinators for a variety of reasons. For fertilizer, 34% of the coordinators reported a lack of supply in

local markets, 32% have little background and knowledge on how to use or apply the available fertilizers in the school, 20% complained that the price of fertilizer is expensive to buy, 7% expressed concern about the high transportation cost of the fertilizers, 5% did not report a fertilizer problem, and 2% reported another fertilizer problem. Fertilizer replaces nutrients lost during crop removal and supplies easily accessible nutrients, allowing crops to grow quicker and provide more food for human consumption (Sedlacek, et al., 2020). Insect pests are common plant enemies, especially during the production period. Pesticides/insecticides were employed by the coordinators to control insect-pest infestations and damage to their garden produce. However, organizers have experienced various pesticide/insecticide concerns. Most coordinators (54%) are concerned about high pesticide prices and a lack of pesticide supply in local markets; 24% are concerned about a lack of technical know-how about the proper use and application of pesticides; 17% do not disclose pesticide problems, and 5% are not concerned about pesticide problems.

Land preparation will be unsuccessful if no machinery or equipment is employed. Farm labor is made easier and faster with the help of machines. The size of the farm or area to be farmed determines the utilization of machinery. If the area is smaller than 0.5-hectare, machinery is not necessary unless the school has the finances to purchase it. Because schools face an urgent problem, malnutrition among students, the use of technology, whether basic or complicated, is thought vital to speed up production and supply and continue their school-based feeding activities. The most common (24%) problems encountered by GPP coordinators in Cawayan are a lack of machinery in the market, an expensive price for the machinery (20%), the inability to use the available machinery immediately (20%), a lack of knowledge of how to use the available machinery (15%), and 5% of the coordinators did not care about the machinery to be used. Post-harvest operations are critical in the cultivation of vegetables. If conventional post-harvest procedures are not followed, significant losses of the crop will occur. The majority of schools (54%) do not have storage facilities for their collected vegetables. This implies that even if the school received a large crop, its products may go to waste since they lack proper storage facilities. The storage facility is significant because it allows for the orderly distribution and delivery of food throughout the year or during a specific time; preservation for an unknown future of low productivity; and price control or stability.

Manpower is one of the production elements that play an essential part in the development and distribution of products. Almost all (93%) of the schools experienced significant difficulties in establishing their GPP because they lacked trained students to assist them in creating and managing the school garden. A coordinator working alone will not greatly boost GPP's position in the classroom. Students should have the necessary information, abilities, and attitudes to become agents of change in their communities. As a result, students contribute significantly to the program's success.

Table 9. Perceived Constraints in the Implementation of GPP in Schools

Constraints	Frequency	Percentage
Soil Problem		
Low soil fertility	36	88
Poor drainage	3	7
Poor water retention	1	2
No problem	1	2
Problem with seed/planting materials		
Not locally available all the time	17	41
Lack of information on improved and suitable varieties	10	24
Quality is not guaranteed	9	22
Price is expensive	4	10

Constraints	Frequency	Percentage
Others	1	2
Fertilizer Problem		
Not locally available all the time	14	34
lack of knowledge of the proper use	13	32
Price is expensive	8	20
cost of transportation is high	3	7
No problem	2	5
Others, Specify	1	2
Chemical/pesticide problem		
Not locally available all the time	11	27
Price is expensive	11	27
lack of knowledge on how to use them	10	24
Others, Specify	7	17
No problem	2	5
Machinery/equipment for land preparation and pre-harvest operation problem		
Not locally available all the time	10	24
Not accessible	8	20
Very expensive to buy	8	20
Lack of knowledge on how to use them	6	15
Others	6	15
No problem	3	7
Post-harvest machinery/equipment/facilities for land preparation and pre-harvest operation problem		
Lack of adequate storage facilities	22	54
Others, specify	14	34
No problem	5	12
Problem with the students		
Lack of skilled students	38	93
Others	2	5
No problem	1	2

Analysis of Gulayan sa Paaralan for Further Improvements

Some of the aspects necessary in GPP implementation to improve school-based GPP are illustrated in the data below. Approximately 46% of GPP coordinators agree to more training and seminars, and 22% value cooperation and interaction with stakeholders such as parents, students, local government, and schools. In addition, 17% of the coordinators stated that they require financial assistance, while 8% require water supplies and other inputs to improve the yield of their school garden. Three out of 41 coordinators stated that they do not have enough vegetable space.

Table 10. Needs of gulayan sa paaralan (school garden) for further improvements

Areas for further improvements	Frequency	Percentage
Coordination with Stakeholders such as Parents, Students, LGU, and School Head	9	22
Training and Seminars	19	46
Financial Support	7	17
Water supply and other inputs	3	8
Suitable Vegetable Area	3	7

Conclusion

The program's aim of supplying vegetables for school-based nutrition programs was not met. As a result, reducing hunger in schools is a difficult task. It was established that feeding hungry students are doable provided the program is effectively conducted and monitored by the appropriate individuals and organizations. Several issues were discovered, ranging from land preparation to post-harvest operations. The majority of schools used bolo to prepare the soil, which took several months to accomplish. The usage of a planting calendar and an activity calendar were not followed, resulting in the program's failure. The Department of Agriculture's role in school garden implementation was not followed, as seen by the coordinators' comments, because farmers were the primary source of their agricultural information. Support from school authorities, particularly in financial matters, is quite limited. Due to a lack of financial assistance, coordinators were not motivated or inspired to do their duties. Some of the coordinators were obliged to use their own money to cover all of the program's expenditures. Because of low vegetable output, gulayan sa paaralan (school gardens) in public schools in Cawayan, Masbate do not make substantial contributions to addressing school malnutrition.

Recommendation

To enhance the execution of the gulayan sa paaralan (school garden) program in schools, school administrators and stakeholders should provide timely support. In terms of money, DepED should issue a memorandum requiring all school principals to set aside a specific amount of their maintenance and other operating funds. Expenditures (MOOE) to finance all GPP expenses. The Department of Agriculture and the Department of Education should always collaborate in monitoring and supplying agricultural inputs as well as essential training/seminars related to the gulayan sa paaralan (school garden) program. Storage facilities for tools, inputs and harvested products should also be built to eliminate produce losses and waste. Hiring a program in charge with agricultural expertise and, if feasible, an agriculture graduate is recommended to focus on producing vegetables, thereby nourishing the starving learners. The teacher who acted in charge program should be assigned only one designation and two subject loads so that the instructor may concentrate on program execution. The department should also seek out or work with an expert from the Department of Agriculture or an agricultural university, such as Dr. Emilio B. Espinosa Sr. Memorial State College of Agriculture and Technology (DEBESMSCAT) for appropriate implementation and increased production of the school garden to accomplish the goal of this planned intervention to combat malnutrition. An extension program entitled Sustaining the DepED Gulayan sa Paaralan Program: the DEBESMSCAT-Cawayan Intervention should be pursued and implemented.

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