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## Empowering women as farm family's food and income providers amidst the Covid-19 pandemic

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**Abstract** Results showed women's increased access to resources and improved knowledge, skills, and attitude toward S&T-based integrated backyard farming. Aside from having a source of food for their family, women farmers were also able to earn additional income amounting to an average of Php 39,447.78 per project site and a computed average initial return on investment of 44.43%. Continuous provision of access to resources to women farmers can help them realize their full potential in agriculture. Provision of capacity enhancement activities in food production, processing, marketing, and recordkeeping; ensuring access to sources of capital and finance to promote entrepreneurial mindset among women farmers; and information campaign on gender and development concepts among community people, particularly to their family members to stress the importance of women rights and capabilities are recommended to strengthen women empowerment in ensuring food security.

**Keywords:** Integrated farming system, Rural development, Community extension, Food security

### Introduction

Food security has been one of the major concerns that were highlighted by the COVID-19 pandemic, which is continuously devastating the Philippine economy at present. With the implementation of enhanced community quarantine (ECQ) in Luzon in 2021, the demand for food and other agricultural commodities has been skyrocketing day by day. Though there is enough food supply according to the Department of Agriculture (DA), the strict implementation of ECQ hampers the transportation and distribution of agricultural produce from the point of production to the point of consumption, thus creating food supply shortages in different parts of the Philippines. With this, there is a need to find alternative ways how to ensure that Filipino people will have enough food on their table.

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Palayamanan project has been one of the successful extension projects of Bulacan Agricultural State College (BASC). It has become instrumental in uplifting the living condition and providing accessible food supply sources to the farmer-beneficiaries as well as to the surrounding community, not only in the province of Bulacan but also in other parts of Central Luzon since this project started in 2005.

The project involves a diversified farming system using rice as a base crop integrating vegetables, livestock, and other farming activities undertaken by the farmer-cooperators in a synergistic approach (Navarro *et al.*, 2017). Beneficiaries were able to not only provide safe and healthy food for their family but also earn from the sale of their extra produce. Other beneficiaries have also shared some of their excess produce with the nearby community people. Farmer-beneficiaries in the previous Palayamanan project which incorporated free-range chicken in their integrated farm were able to gain an average return on investment (ROI) of 53.01% from the computed individual beneficiary's ROI ranging from 24.20% to as high as 372% (Navarro *et al.*, 2021).

However, various interventions provided by the previous Palayamanan projects to the beneficiaries were mostly men-centered. The majority of the listed farmer-beneficiaries who received training and financial support from the project were men. Farm's success was usually attributed to the farmer-cooperator listed in the project who is mostly men. This is even though farm work in their small-scale family farms involved the vital participation of women's family members.

Women participate in many activities along the value chain (Polar *et al.*, 2015 as cited in Devaux *et al.*, 2018). Their engagement in agricultural activities is economically important for their households (UN-Women, 2018). However, the important roles that women family members play to ensure the success of the Palayamanan project on their farm were often invisible. Unfortunately, women farmers are at an even greater disadvantage due to societal and cultural norms that are still prevalent in the Philippines (FAO, 2018).

Based on the record of the Philippine Commission on Women, unpaid family workers in their family-operated farm or business in October 2010 were estimated at 4.3 million, and 2.4 million (56.7%) of which were women while only 1.8 million (43.3%) were men (Labor, Employment & Economic Participation, 2014). This shows that women are major contributors to agriculture and other allied fields (Slathia, 2015).

It is on this note that this project was conceptualized and implemented to empower women farmers through the provision of access to technology and other resources. This project has also made them instrumental in creating

alternative food sources and additional sources of income in the midst of and after the COVID-19 pandemic through the revitalization of the S&T-based integrated backyard farming system. The project aims not only to provide a band-aid solution during the crisis but also to sustain and expand the technology adoption to a larger number of women farmers in the community.

Generally, the project was aimed at empowering women while promoting an S&T-based integrated backyard farming system as a source of food during and after the COVID-19 pandemic. Specifically, it sought to increase the access to resources of women farmers, improved the knowledge, skills, and attitude of the target beneficiaries on the S&T-based on the integrated backyard farming system and enabled women farmers to provide safe and healthy foods, and additional income to their farm families.

## **Materials and methods**

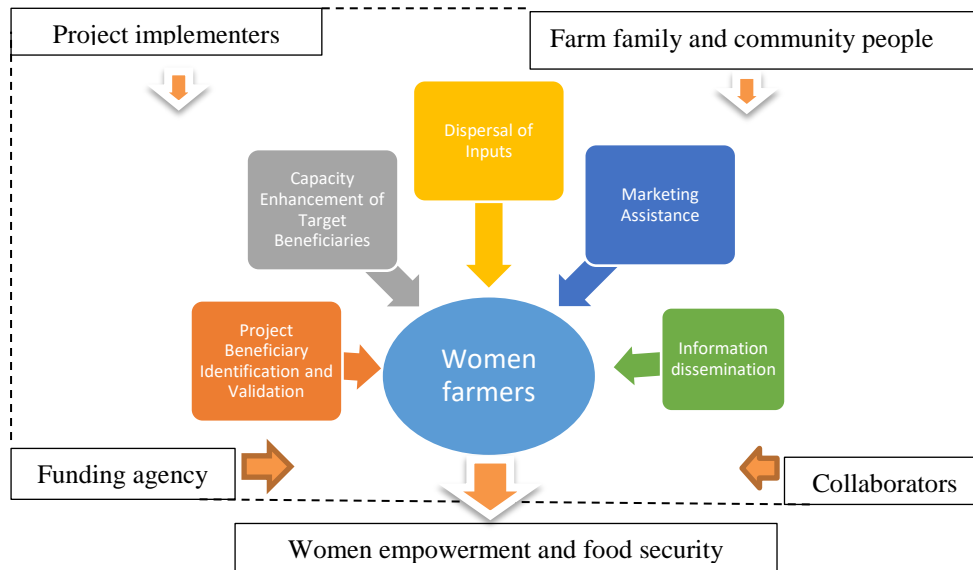
### ***Research design***

The study used a descriptive mixed-method approach in analyzing the effect of the extension intervention provided to the women farmer-beneficiaries. Analysis was anchored on the effect of the results of the implementation of the five project components aimed at achieving women's empowerment and food security.

The development achieved by empowering the drivers in the community was conceptualized by Labonne and Chase (2007) (Figure 1). These drivers included women farmers, project implementers, funding agencies, and collaborators. Empowering women and securing food are parts of achieving inclusive growth. Inclusive growth, on the other hand, can start with the enhancement of drivers, which is used, for collective action (Casey *et al.*, 2011; Labonne and Chase, 2008). By enhancing the knowledge, skills, and attitudes of drivers of the community, relevant activities were utilized towards the attainment of this common goal. By forging effective linkages among the community drivers, the development of the community was recorded as more responsive to the needs of the community (Dongier *et al.*, 2003).

### ***Sampling and data gathering techniques***

To document all the cases of the project beneficiaries, the total enumeration technique was employed in determining the sample size of the respondents. Cases of beneficiaries in each project site were documented through field observation during periodic monitoring.



**Figure 1.** Conceptual framework of the project

Data on their training needs were gathered through the use of a researcher-made survey questionnaire and test items before the conduct of the training. The used instruments were subjected to pre-test by community extension experts to validate the nature of the questions asked. Comments and suggestions were incorporated for the improvement of the questionnaires.

Meanwhile, the effectiveness of the training provided on the level of knowledge gained by the trainees was based on the difference in the scores of their pre-test and post-test. Follow-up interviews were also done to solicit additional information and verify the accuracy of the data gathered.

### *Statistical analysis*

Descriptive statistical tools such as frequency count, percentage, rank, paired-sample t-test, and return on investment were used in this study. Demographic characteristics of project beneficiaries were analyzed using descriptive statistics such as frequency count and percentage.

Paired sample t-test was used in analyzing the difference in the pre-test and post-test scores of the beneficiaries. A cost-benefit analysis was done through the computation of return on investment based on the harvest and sales records of the beneficiaries.

## Results

### *Increased access to resources for women farmers*

A total of 93 women farmers were provided and increased their access to resources by being included in the list of project beneficiaries after a series of beneficiary identification and site validation activities conducted by the project team and assigned agricultural extension worker (AEW).

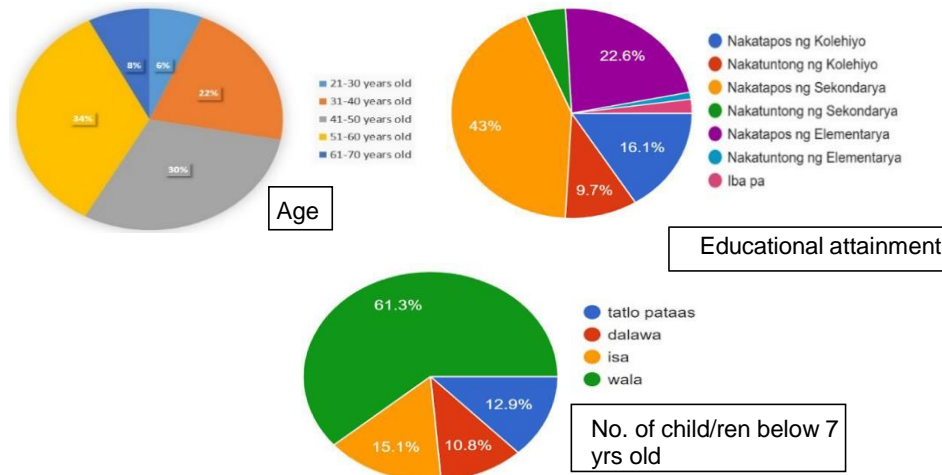
The total number of beneficiaries is exceeded by three from the original target number, which were only 90 women farmers as shown in Table 1. This is due to the identified beneficiaries in Malipampang/Telapatio, San Ildefonso; Bulacan became 23, instead of only 20. Due to the interest expressed by all the women farmers who attended the project orientation at the said project site, the project team decided to include all 23 women farmers considering that one of the objectives of the project was to provide access to resources to women farmers. Other project sites included in the second batch only 20 each (Biclat, San Miguel; and Maronquillo, San Rafael). The first batch of beneficiaries was composed of 10 women farmers each from Gabihan and Basuit, San Ildefonso, Caingin, San Rafael; and Pulong Bayabas, San Miguel, Bulacan.

**Table 1.** Distribution of women farmer-beneficiaries per site

Project site	Number of beneficiaries
Basuit/Gabihan, San Ildefonso	10
Pulong Bayabas, San Miguel	10
Caingin, San Rafael	10
Malipampang/Telapatio, San Ildefonso	23
Maronquillo, San Rafael	20
Biclat, San Miguel	20
Total	93

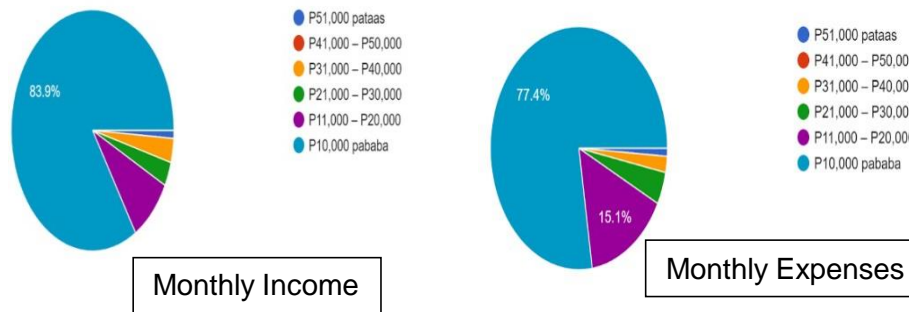
This project addressed the common constraint faced by women farmers in the selected project sites, which is limited access to resources. Based on the result of sex-disaggregated data collected from the respondents, more than two-thirds (64%) of the 93 women farmers belong to the age group of 41 to 60 years old as shown in Figure 2. This was not surprising as this project targets the housewives of the farm family who usually stays at home as evidenced by more than one-third (37.6%) of them who usually spent 4 to 6 hours in doing their household chores. Only a few (38.8%) have children below seven years old, while the majority (61.3%) of them did not have any. Thus, the majority of them had ample time in doing other activities and also performed other duties and responsibilities in their community such as being cooperative members (35.5%), church leaders/members (26.9%), and barangay employees (23.7%) wherein

almost half (49.5%) of them usually spent 1 to 3 hours of service in their community.



**Figure 2.** Sex disaggregated data of project beneficiaries

In terms of educational attainment, almost half (43%) of them also were able to finish their secondary education while 22.6% of them were elementary graduates. As to their livelihood, the majority (58.1%) of them listed farming as their main source of living indicating that the majority of women beneficiaries came from farm families who were involved in agriculture.



**Figure 3.** Monthly income and expenses of beneficiaries before the project implementation

The majority (83.9%) of them were also earning below P 10,000 monthly income (Figure 3). When asked if their family income is enough to support their daily living, the majority (75.3%) said no as evidenced by the higher monthly

expenses compared to their monthly income wherein only 77.4% have equal to P10,000 and below monthly expenses while the rest had more than P 10,000 monthly expenses. It showed that the percentage of women farmers who earned P10,000.00 and below monthly income was 6.5% lower compared to the percentage of those who were spending P10,000.00 monthly expenses indicating that more women farmers have bigger expenses compared to their earned income. They knew this insufficiency because the majority (88.2%) of the beneficiaries were in charge of managing the finances of their family.

***Improved knowledge, skills, and attitude of the target beneficiaries on S&T-based integrated backyard farming system***

With the computed t-value of -16.299, with a p-value of 0.000, the difference between the scores of the pre-test and post-test administered to the project beneficiaries during the training on chemical pesticide-free integrated backyard farming was a highly significant difference. An increase from an average pre-test score of 5.65 (sd=2.501) was noted as evidenced by their average post-test scores of 8.31 (sd=2.479) after the training was provided to them (Table 2).

**Table 2.** The difference in test scores of beneficiaries on a bio-organic concoction

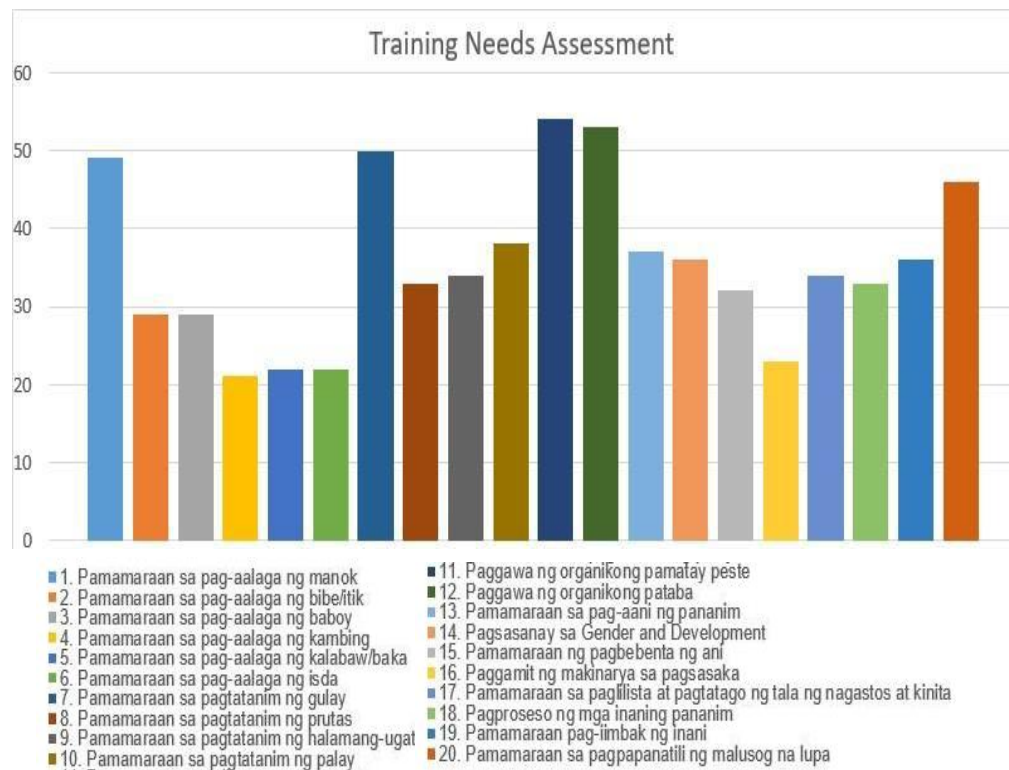
	Before		After	
	Mean	SD	Mean	SD
Vegetable Production	5.65	2.501	8.31	2.479
T value	-16.299			
p-value	0.000			

Likewise, in terms of free-range chicken production management, the computed t-value of -14.872, with a p-value of 0.000 (Table 3) showed that there was also a significant difference between the scores of pre-test and post-test of the project beneficiaries given to them during the training on chemical pesticide-free integrated backyard farming. An increase from an average pre-test score of 8.911 (sd=2.5291) was noted as evidenced by their average post-test scores of 11.844 (sd=2.1771) after the training was provided to them.

**Table 3.** The difference in test scores of beneficiaries on free-range chicken management

	Before		After	
	Mean	SD	Mean	SD
FRC Production & Management	8.911	2.5291	11.844	2.1771
T value	-14.872			
p-value	0.000			

The training provided to the women farmers was based on the results of the training needs assessment (Figure 4), wherein the beneficiaries rated training on chicken production and management, vegetable production, preparation of organic fertilizer, bioorganic pesticide, and soil conditioning as highly needed to enable them to establish their own S&T-based on the integrated backyard farms.



**Figure 4.** Results of training need assessment of project beneficiaries



***Enabled women farmers of providing safe and healthy foods, and additional income to their farm families***

The production of different vegetables and free-range chicken is shown in Table 4. It became a source of alternative food and income for women farmers during the pandemic.

**Table 4.** Distribution of harvest record per project site

Produce/ Project Sites	Pulong Bayabas, SMB	Caingin, SRB	Gabihan/ Basuit, SIB	Maronquillo, SRB	Malipampang/ Telapatio, SMB	Biclat, SMB	Total Harvest
Eggplant (kg)	150	83	110	286	455	505	1,589
Tomato (kg)	161	80	87.5	342	446	392	1,509
Green pepper (kg)	122.5	96	112.25	242	386.75	415.5	1,375
Chilli pepper (kg)	111.6	40	123.25	253	443	212.6	1,183
Okra (kg)	0	55.5	75.25	0	0	152	283
Corn (kg)	101	40	78	157	228.75	176	781
Pechay (kg)	0	37	65	166	250	244	762
Kangkong (kg)	0	38	0	0	0	197	235
Squash (kg)	0	35	77	0	0	0	112
Sigarilvas (kg)	109	30	43	0	0	0	182
Sitao (bundle)	137	40	97	239	275	223	1,011
Chicken egg (pcs)	3290	2346	3260	6432	6396	5133	26,857
FRC Chicks (head)	134	45	242	231	222	504	1,378

\*as of October 20, 2022

A total of 83 chemical pesticide-free integrated backyard farms and one community farm were established in the three municipalities. Farm inputs distributed to beneficiaries were composed of different vegetable seeds, seedlings, three ready-to-lay and one cockerel free-range range chicken, vermicompost, and bio-organic concoction kit (pail, molasses) as their start-up inputs in establishing their respective integrated backyard farms. These resources were provided to women farmers so that they can have the opportunity of adopting the chemical-pesticide-free integrated backyard farming technology extended to them. Meanwhile, the computed return on investment of the established pesticide-free integrated backyard farms in the three municipalities in Bulacan served not only as a source of food but also gave additional income to beneficiaries during the pandemic period (Table 5).

**Table 5.** Return on investment per project site

Project Sites	Total Harvest Value	Total Expenses	Net Income	ROI	Rank
Pulong Bayabas, SMB	P 70,487.00	P 51,039.00	P 25,937.00	38.10	5
Caingin, SRB	45,933.00	33,507.00	12,426.00	37.08	6
Gabihan/Basuit, SIB	67,780.00	48,806.00	18,974.00	38.88	4
Maronquillo, SRB	138,506.00	87,777.00	40,019.00	57.79	3
Malipampang/ Telapatio, SIB	182,623.00	85,899.50	96,723.50	112.60	1
Biclat, SMB	162,492.75	83,631.60	78,861.15	94.30	2
<b>Average</b>	<b>P 108,710.50</b>	<b>P 67,924.22</b>	<b>P 47,664.73</b>	<b>63.125</b>	

\*October 20, 2022

Among the project sites, women farmer-beneficiaries at Brgy. Malipampang/Telapatio gained the highest combined return on investment (ROI) of 112.60% as of October 20, 2022, followed by those at Brgy. Biclat (94.30%) and those at Brgy. Maronquillo (57.79%). These top three sites with the highest ROI composed the second batch of added beneficiaries with 20 beneficiaries each, except for Malipampang/Telapatio with 23. As expected, since the community farm in Brgy. Caingin was devastated by natural calamities; beneficiaries here recorded the lowest collective ROI of only 37.08%. It can also be noticed that the bottom three sites that earned the lowest ROI were the first batch of beneficiaries (10 each per site) as they were also affected by these calamities, although it was Brgy. Caingin which was hard hit.

Total sales of the agricultural produce of the project sites were computed on the prevailing average market price in their respective barangays as they sold their excess harvest mostly to the households in their community. Since the prices of agricultural commodities are fluctuating, prices used in the computation were based on the average prices. Eggplants were sold at an average price of P40.00/kg, tomatoes at P70.00/kg, green pepper at P50.00/kg, chili pepper at P70.00/kg, okra at P40.00/kg, corn at P50.00/kg, peachy at P70.00/kg, squash at P25.00/kg, sigarilyas at P60.00/kg, kangkong at P20.00/tali, sitao at P10.00/tali, FRC eggs at P8.00 per piece and FRC chicks at P60.00/head.

Expenses incurred by the beneficiaries included in the computation of their ROI, on the other hand, are the cost of farm inputs (assorted vegetable seeds/seedlings, vermicast and molasses, 4 FRC, and vitamins) distributed to them. The cost of egg trays and feeds consumed by the FRC was also included as operational costs. However, the labor cost, FRC housing cost, and cost of other ingredients used in making different concoctions were not included in the cost

computation. It was due to consider as counterparts of the beneficiaries, wherein they only utilized resources readily available in their surroundings.

Notably, despite the calamities experienced by the beneficiaries, the computed ROI of the beneficiaries in all the project sites was positive indicating that they were able to still somehow enjoy the benefits of the project during difficult times of the pandemic as an additional source of food and income amounting to an average of P 47,664.73 per project site.

## **Discussion**

### ***Increased access to resources for women farmers***

This project addressed the common constraint faced by women farmers in the selected project sites which is limited access to resources. The same dilemma was being faced by women farmers in India, wherein their access to resources is much lower compared to their male counterparts despite the former's significant contribution to agriculture in their country (Baruah *et al.*, 2022). Vidyakala (2018) found out that one of the factors hindering women from adopting new technologies is the limited access to productive resources such as farm inputs.

This project has become instrumental in providing and increasing the access to resources of women farmers in the community. From the original target number of project beneficiaries, which is only 90 women farmers, the total number has exceeded by three beneficiaries, making the total 93. The majority of whom were first-time recipients of government projects which is why they were very grateful that they were chosen as one of the beneficiaries who have gained access to agricultural resources, which were vital for the establishment of their integrated backyard farm.

One beneficiary from Brgy. Telapatio claimed that although she is helping her husband in the works on their farm, it was usually her husband who used to become the recipient of government projects because he is a member of a farmer's cooperative in their barangay. Through this project, she was very thankful that this time, she, together with other homemakers in their community, were allowed to be enlisted as the beneficiaries of this project. These women farmers are homemakers of a farm family who usually stays at home doing household chores and performing other duties and responsibilities in their community such as being cooperative members, church leaders/members, and barangay employees. This was because the majority of them do not have children below seven years old, hence, they have ample time in doing other community-related activities.

Those who were given access to resources needed additional sources of income as evidenced by the lower percentage (6.5%) of women farmers who

earned P10, 000.00 and below monthly income compared to the percentage of those who were spending P10, 000.00 monthly expenses. This seems to indicate that more women farmers have bigger expenses compared to their earned income. These beneficiaries knew very well this insufficiency because the majority (88.2%) of them have suffered from this dilemma for a long time. This is because they were the ones in charge of managing the finances of their family. Women farmers in the Philippines have the same case as those in Guyana, wherein they also have shared functions of taking care of their families using their income while also contributing to food security (Henry, 2021). One of the project beneficiaries even said that this pandemic make it even more difficult for their family to make ends meet as they lost their job due to the strict restrictions imposed during the lockdown period. Thus, the implementation of this project became very timely as it gave them additional sources of food and income.

***Improved knowledge, skills, and attitude of the target beneficiaries on S&T-based integrated backyard farming system***

The significant difference in the test results of the scores on the pre-test and post-test of the beneficiaries seems to indicate that the training provided was effective in increasing the knowledge of the beneficiaries on the topics discussed including free-range-chicken production management and integrated vegetable production, particularly, in the preparation and use of bioorganic concoction and pesticides. The hands-on activities included in the training provided to the beneficiaries have exposed them to how to make bioorganic concoctions, how to determine the laying capacity of free-range chicken, and how to apply vaccines to newborn chicks.

*“Ngayon po alam ko na kilatisin kung mangingitlog pa ba o hindi na ang manok ko, salamat po sa naituro nya sa amin” (Now, I can already determine whether my chicken can still lay eggs or not. Thank you for this knowledge that you shared to us) – Beneficiary 65*

Improvement in the skills of beneficiaries was also observed as they can already produce their bioorganic concoction, which they learned from the hands-on training provided to them. One of the beneficiaries even said that although the preparation of bioorganic concoction initially was laborious, the benefits that they derived from these less costly fertilizers and pesticide outweighs the added labor.

*“Katulong ko naman po ang mga anak ko sa paggawa ‘nung concoction, kaya madali na din po gawin kapag natutunan talaga, at saka po nasa paligid lang din po namin makukuha ang mga kailangan gamitin” (My children helped me in preparing concoction, that’s why it became easy as we become used to*

*doing this. And also, the materials needed were available in our surroundings) - Beneficiary 25*

Change in the attitude of the beneficiaries towards chemical pesticide-free integrated farming was also noted as they become aware of the harmful effects of chemical pesticides on their family's health.

*“Dati po gamot ng halaman ang tawag naming doon. Ngayon po, hindi pop ala talaga sya gamut, kundi lason po pala sa katawan namin” (Before, we used to call that as plant medicines. Now, we already know that these are not really medicines, but poison to our body. We will share this also to others) – Beneficiary 39*

These capacity enhancement activities were crucial to ensure that women farmers will be able to sustain the operation of their integrated backyard farms. Like in the case of women farmers in Bangladesh, Slathia *et al.* (2015) concluded in their study that farm training for women was useful in securing their livelihood, and thus could also change their situation.

The group of beneficiaries in Brgy. Caingin where the community-based farm was established have expressed their appreciation of the training given to them because they became knowledgeable on preparing bioorganic concoction using only the available resources in their community. Their group leader also claimed that because of the training, they became aware of the importance of having not only a sustainable source of food but also more importantly, having a safe source of food for their family. This is particularly important since most of the agri-food sector relies on pesticides, which negatively affect the environment and human health (Jacquet *et al.*, 2022).

### ***Enabled women farmers of providing safe and healthy foods, and additional income to their farm families***

Women farmer beneficiaries have provided safe and healthy foods for their families during one of the most difficult times of the century. One of them even stated that harvest from their established chemical pesticide-free integrated backyard farm helped them a lot to survive everyday living during the pandemic times.

*“Malaking tulong po sa amin to. Dahil po sa proyekto na to, hindi na po naming pinoproblema ang ulam sa pang-araw-araw. Namumulot lang po kami ng itlog sa bakuran at pipitas ng gulay, may ulam nap po kami agad” (This project is a big help to us. Because of this project, our food every day is no longer a burden. We just have to pick free-range chicken eggs and vegetables from our backyard, then we already have an instant food” – Beneficiary 40*

Vidyakala (2018) found out that one of the factors hindering women from adopting new technologies is the limited access to productive resources such as farm inputs.

*”Yung likod bahay po namin dati na nakatengga lang o di kaya madalang lang po mataniman, ngayon po ay masarap na po tingnan. Masarap na sa mata, masarap pa sa lasa” (Our backyard which was idle area before and planted rarely, now has transformed into a delicious area both for our eyes and stomach) – Beneficiary 15*

Each established backyard farm has operated on an integrated farming system. In many Asian agriculture, a farming system that has gained a reputation is the Integrated Farming System (IFS) otherwise called diversified farming (Bhatt and Bujarbaruah, 2011). IFS represents an integration of various enterprises such as cropping systems, horticulture, animal husbandry, fishery, agro-forestry, apiary, waste management, fungi culture, etc. for optimal utilization of farm resources to generate additional income and employment among small-scale and marginal farmers (Behera *et al.*, 2012). In this project, the beneficiaries used animal wastes as fertilizers for their crops (chicken manure) after these have been thoroughly dried. The rejected vegetable harvests, on the other hand, were used as supplemental feeds to the free-range chicken, thus reducing the cost of feed consumption. This enterprise of diversified farming systems integrated with free-range chicken (FRC) production is gaining popularity (Yan, 2019).

In terms of financial gains, the computed ROI of women farmer-beneficiaries of this project is at par with the ROI of the farmer-beneficiaries in the previous Palayamanan project, which also incorporated free-range chicken in their integrated farms who have gained an average ROI of 53.01% from the computed individual beneficiary's ROI ranging from 24.20% to as high as 372% (Navarro, *et al.*, 2021).

The prices of the agricultural commodities at which these were sold to customers were at par with the retail prices of these commodities in Central Luzon based on the price monitoring of the Philippine Statistics Authority (PSA) in the first half of 2022 ([psa.gov.ph](http://psa.gov.ph)).

This is consistent with the finding of UN-Women, 2018, which states that women's engagement in agricultural activities has economic importance for their households. It also further shows that women are major contributors to agriculture and other allied fields (Slathia, 2015).

Their family consumed the initial production of the beneficiaries, while that excess was easily sold to the household in their barangay since the production is just small-scale. Project beneficiaries noted that they did not experience difficulty in marketing their produce.

*“Madali lang po naming naibebenta yung mga ani namin. Minsan nga po, hindi pa ready anihin may nag-aabisa na sa amin na ipagtabi sila. Alam po kasi nila na di naming to ginagamitan ng kemikal” (We have easily sold our produce. In fact, there are times wherein even if our crops are not yet ready for harvest, some of our neighbors are requesting us to set aside some for them. This is because; they knew that we did not used any chemicals on it) – Respondent 73*

Beneficiaries have also shared that they have set aside a certain percentage of the proceeds of their sales as a source of funds for buying seeds and seedlings of vegetables for the next planting season. Through this, they will be able to sustain their backyard farm operation.

Several studies on IFS adoption in many regions of the world (Lal *et al.*, 2018; Navarro *et al.*, 2017; Dash *et al.*, 2015) have proven its positive economic impact and increased agricultural productivity of farmer adopters. In a study conducted in Southern Thailand, Changkid (2013) demonstrated that farmers who practice IFS for over 5 years recorded an increased income compared to non-adopters. Likewise, better living standards and well-being were also evident among IFS farmers due to knowledge and skills gained on intensification of farming activities from the IFS principles.

Women farmers, if given a chance, can be vital contributors to achieving food security and augmenting their family income, especially in difficult times amid the pandemic. This extension project has highlighted the importance of women’s empowerment in the agriculture sector, which resulted in additional sources of income and safe and healthy food for the family. The provision of access to resources, farm inputs, hands-on training, IEC materials, and establishments of S&T-based integrated backyard farms have empowered women farmers in the selected community. Production of agricultural commodities using pesticide-free farming practices was also revitalized through this project.

The project team envisions that this project could open the door for more women’s participation in the agriculture sector to ensure food security. Through continuous women empowerment, due appreciation and giving importance to every role that women play in agricultural production, processing, marketing, and recordkeeping will be credited to them. Women, when organized, can perform valuable contributions to ensuring that their families will have a source of safe and healthy food on their table. More women in the community will be reached through a pass-the-gift scheme of this project whereby the benefits received by one beneficiary will be shared with other women who would like to adopt the chemical pesticide-free integrated agricultural production and thus, will result in project sustainability

Continuous provision of access to resources to women farmers can help them realize their full potential in agriculture. Policies on the provision of capacity enhancement activities in food production, climate-smart agriculture, processing, marketing, and recordkeeping; ensuring access to a source of capital and finance to promote an entrepreneurial mindset among women farmers; and information campaign on gender and development concepts among community people, particularly to their family members stressing the importance of women rights and capabilities are recommended to strengthen women empowerment in ensuring food security. More projects like this could also be done to encourage more community people to adopt chemical pesticide-free agricultural production to ensure not only food security but also security on the availability of safe and healthy food for families. Conduct of soil analysis to check possible exposure to pesticides from neighboring backyard farms may also be done in phase 2 of this project to verify whether the beneficiaries' backyard farms are free from pesticide contaminants.

### **Acknowledgments**

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### **References**

- Behera, U. K., Panigrahi, P. and Sarangi, A. (2012). Multiple water use protocols in integrated farming systems for enhancing productivity. *Water Resour Manage*, 26:2605-2623.
- Bhatt, B. P. and Bujarbaruah, K. M. (2011). Eco-energetic analysis of integrated agro-aquaculture models, North Eastern Himalayan region, India. *Journal of Sustainable Agriculture*, 55:495-510.
- Baruah, S., Mohanty, S. and Rola, A. C. (2022). Empowering women farmers through collective action: a case study of Khanizpur Hamlet, Odisha. *Gender, Technology and Development*, 26:58-73.
- Casey, K., Glennerster, R. and Miguel, E. (2011). Reshaping institutions: Evidence on external aid and local collective action (Working Paper No. 17012). Retrieved from <http://www.nber.org/papers/w17012>



- Changkid, N. (2013). The Factors Production Use Efficiency in the Integrated Farming in Surrathani Province, Southern Thailand. *Procedia-Social and Behavioral Sciences*, 91:376-384.
- Dash, A. K., Ananth, P. N., A., Sahoo, P. R., Banja, B. K. and Jayasankar, P. (2015). Empirical Proof on Benefits of Integrated Farming System in Smallholder Farms in Odisha. *Current Agriculture Research Journal*, 3:69-74.
- Devaux, A., Torero, M., Donovan, J. and Horton D. (2018). Agricultural Innovation and inclusive value-chain development: a review. *Journal of Agribusiness in Developing and Emerging Economies*. Vol 8, No. 1, pp.99-123. Emerald Publishing Limited, 2055-0839.
- Dongier, P., Domelen, J. V., Ostrom, E., Rizvi, A., Wakeman, W., Bebbington, A., Alkire, S., Talib, E. and Polski, M. (2003). Chapter 9: Community-driven development. *The Poverty Reduction Strategy Sourcebook Volume 1* (pp. 301-331). Washington DC: The World Bank.
- FAO (2018). Country Gender Assessment of Agriculture and Rural Sector in the Philippines, Manila, pp. 58. Retrieved from <http://www.fao.org/3/ae946e/ae946e03.htm>
- Henry, P. (2021). Rural Women Farmers and Sustainable Livelihoods in Guyana. *International Journal of Scientific Research and Management*, 9(08), 666–682. <https://doi.org/10.18535/ijstrm/v9i8.sh02>
- Jacquet, F., Jeuffroy, MH., Jouan, J. et al. Pesticide-free agriculture as a new paradigm for research. *Agron. Sustain. Dev.* 42, 8 (2022). <https://doi.org/10.1007/s13593-021-00742-8>
- Labor, Employment and Economic Participation (2014). Philippine Commission on Women, National Machinery for Gender Equality and Women Empowerment. (Online). Retrieved from <https://www.pcw.gov.ph/statistics/201405/statistics-filipino-women-and-men-labor-and-employment> (May 2014).
- Lal, M., Patidar, J., Kumar, S. and Patidar, P. (2018). Different integrated farming system model for the irrigated condition of India on basis of economic assessment: A case study: *International Journal of Chemical Studies*, 6:166-175.
- Labonne, J. and Chase, R. S. (2008). Do community-driven development projects enhance social capital? Evidence from the Philippines (Working Paper No. 4678). Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/6823/WPS4678.txt?sequence=2>
- Labonne, J. and Chase, R. S. (2007). Who's at the wheel when communities drive development? The case of the Kalahi-Cidss in the Philippines (World Bank Social Development Paper No. 107). Retrieved from [http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/2443621170428243464/Whos\\_at\\_the\\_Wheel.pdf](http://siteresources.worldbank.org/EXTSOCIALDEVELOPMENT/Resources/2443621170428243464/Whos_at_the_Wheel.pdf)
- Navarro, I. S. A., Ballaran, R. A. and Esguerra, I. D. (2017). Sustainability of PALAYAMAN Project in the Rainfed Lowland and Upland Areas Bulacan, Philippines. *The CLSU International Journal of Science and Technology*, 2:39-46.
- Navarro, *et al.* (2021). Rice-Based Farming System Integrated with Free-range Chicken Production for Small-Hold Farms. Terminal Report submitted to DA- RFO3. February 2021.
- Price Situationer of Selected Agricultural Commodities First Phase of April (2022). Retrieved from <https://psa.gov.ph/content/price-situationer-selected-agricultural-commodities-first-phase-april-2022>
- Slathia, N. (2015). Participation of Women in Agricultural Production. *Agriculture Towards a New Paradigm of Sustainability*. pp. 150-157.

- UN Women (2018). Women's Participation in Agricultural Sector, Rural Institutions, and Community Life. Retrieved from <https://jordan.unwomen.org/sites/default/files/Field%20Office%20Jordan/Attachments/publications/2018/WOMENS%20PARTICIPATION%20IN%20THE%20AGRICULTURAL%20SECTOR%20RURAL%20INSTITUTIONS%20AND%20COMMUNITY%20LIFE.pdf>
- Vidyakala, K. A. (2018). Conceptual study about problems and challenges faced by women farmers in India. *Bonfring International Journal of Research in Arts and Science*. Retrieved from <https://ssrn.com/abstract=3614308>.
- Yan, G. (2019). Why free-range is booming in the Philippines. Retrieved from <https://www.thepoultrysite.com/articles/why-free-range-is-booming-in-the-philippines>

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