



## RESEARCH PAPER

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## Establishing baseline data for school + home community project towards improved livelihood, literacy and climate resiliency

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### Abstract

Involving the community in the development process is vital. The overall purpose of this project is to construct School Plus Home Cacao Processing Learning Sites. The researchers used a community-based participatory action research design. The project has 15 participants from Nabannagan West, Lasam, Cagayan. As a result, the School Plus Home (S+H) Cacao Learning Sites were effectively introduced as a demonstration and processing area of livelihood, health, literacy, and climate resiliency in Nabannagan National High School. Cacao is regarded as a prospective economic activity by the majority of Nabannagan West locals. The majority of respondents stated that cocoa production provides them with an additional source of income. Respondents highlighted high production costs and labor scarcity as the two most significant difficulties to cocoa production. This project, which has been established by the CSU-Lasam campus, will serve as a starting point for advancement not only for the Campus, but for everyone. To summarize, cacao production should be valued since, as long as everyone helps each other, it may be beneficial for us to have enough revenue and, of course, to save our environment.

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## Introduction

Poverty reduction was prioritized heavily in both the post-2015 development agenda for the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs). And the latter was supplemented by inequality (Wan & Wang, 2019). Poverty is a global socioeconomic issue because people and families lack access to fundamental necessities (Cudia, 2019). For the people of the Philippines, poverty is still a problem (Ross *et al.*, 2017; Skoufias *et al.*, 2019; Tingzon *et al.*, 2019). Despite its best efforts, the Philippines continues to lag behind its Southeast Asian neighbors in the fight against poverty, with about 22 million Filipinos living below the national poverty threshold (Philippine Statistics Authority, 2018). Additionally, for the past 50 years or so, the Philippines' economic development and growth have seen a boom and bust cycle (Asian Development Bank, 2007). As a result, several Philippine administrations have endeavored but failed to reduce poverty (Agbola *et al.*, 2017; Albert & Martinez, 2015).

Weakness in job creation and job quality generation is one of the major contributors to poverty in the nation. Even though there are more young people entering the labor force than ever before, employment growth has not kept pace to accommodate these additional workers (Camba, 2020). Because of this, youth are particularly affected negatively by unemployment, which is a significant socioeconomic problem in the Philippines. Furthermore, Filipinos have a higher likelihood of working in low-quality jobs, being underemployed, putting in long hours for little pay, engaging in dangerous work, or having only temporary or informal employment arrangements (Chulanova *et al.*, 2019).

Furthermore, the Philippine government has failed to adequately develop the country's agricultural industry. In contrast to many other Southeast Asian countries, the Philippines' integration of agriculture and fisheries into global value chains has not resulted in significant reductions in rural poverty. Although some downstream exports have been successful, upstream firms continue to operate in insecure

environments (Andriessie, 2018). Another cause for the country's poverty is that it is frequently subjected to economic crises (Montes, 2018), conflicts (Rubin, 2020), natural disasters (Holden, 2017), and environmental poverty.

In addition to poverty, Filipinos face the difficulty of malnutrition. Despite the fact that more than one billion adults worldwide are overweight, the global and national food and nutrition situation reveals that over 900 million people are malnourished (FAO *et al.*, 2017). Malnutrition was a global issue that also affected Asia Pacific countries such as the Philippines (Gamelong, 2018; Pasion, 2019; Ulep, 2021; Vargas *et al.*, 2018). Undernutrition and overnutrition coexist in the Philippines, indicating nutritional problems (DOST-FNRI, 2015).

Malnutrition is said to be caused by a number of interconnected concerns, including those affecting people's physical, mental, social, and economic health. The availability of food, its distribution, and how the general population consumes it all have an impact on people's nutritional state (Capanzana & Aguila, 2020).

Protein-energy malnutrition (PEM), vitamin A deficiency (VAD), iron deficiency anemia (IDA), and iodine deficiency (IDD) are the four primary deficiencies in children in the Philippines. In the Philippines, PEM not only causes development retardation and hazardous underweight in children aged 0-5 years, but it also has a significant mortality rate in newborns and toddlers (Salvacion, 2017).

According to the most recent National Nutrition Survey conducted by the Food and Nutrition Research Institute, the average rate of stunted and underweight children in the United States was 30.3 percent and 19.9 percent, respectively. Undernutrition in children results in economic losses of Php 328 billion, or 2.84 percent of the country's GDP, according to a 2013 study conducted by DOST-FNRI and Save the Children, while stunting-related grade-level repetition caused by frequent absences and subject repetition results in losses of Php 1.23 billion (DOST-FNRI, 2015).

The environment is deteriorating significantly in the Philippines as well. Because of the numerous documented detrimental effects, including soil erosion, landslides, flooding, biodiversity loss, and watershed degradation, the country's ongoing deforestation has been a serious worry. When one takes into account the crucial role that forests play in the storage of atmospheric carbon dioxide, the maintenance of current biodiversity, and the resilience of ecosystems to climate change, the implications are more severe (Perez *et al.*, 2020).

With the identified difficulties, the researchers decided to create a project called the school plus home cacao project towards improved livelihood and climate resiliency, which is a community-based cacao participatory cacao processing enterprise model. It creates a relationship between the school and the community in order to increase the number of cacao plants in the area and generate safe and nutritious cacao products, giving people in the community greater income and improved health. Furthermore, cocoa tree cultivation could contribute to land regeneration, preventing floods, soil erosion, disrupting hydrological systems, and possibly extinction of species. The project also intends to expand community awareness about cacao cultivation, processing, and nutrition through trainings and interventions. To summarize, the project provides livelihood, improved health, literacy, and climate adaptability, all of which are extremely beneficial given the current demand. With these said, the project supports the SDGs, which call for the inclusion of quality education, climate action, zero hunger, and zero poverty as cornerstones of global progress.

For millions of people worldwide, the tropical fruit crop *Theobroma cacao* (cacao) is an important source of income from agriculture. Over 40 million people depend on it for their livelihood, and about 6 million farmers cultivate it globally (Beg *et al.*, 2017). Smallholder farmers produce 80 to 90 percent of the world's chocolate crop (World Cocoa Foundation, 2014). Originally planted in the Amazonian basin, this crop is now produced throughout the humid tropics

(Wickramasuriya & Dunwell, 2018). Cacao is also the third-largest agricultural export in the world and the second-largest cash crop in the tropics (Daz-Montenegro *et al.*, 2018). Approximately 7-8 million little family-run cacao farms in more than 50 countries produce more than 80% of the world's chocolate, according to estimates (ECLAC *et al.*, 2015).

According to Shahanas *et al.* (2019), cocoa is considered as a super food due to its high nutritional value and well-established health benefits.

Cocoa beans are high in nutrition, with 31% coming from carbohydrates and 11% each from protein, fat, fiber, and minerals. Furthermore, cocoa is a rich source of bioactive compounds. Polyphenols, which are composed of flavonoids and other non-flavonoids, are the primary bioactive components. The bioactive components' strong antioxidant and anti-inflammatory activity levels are credited with numerous health benefits.

#### *Context of the Study*

The agricultural community of Municipality of Lasam, a third-class municipality of the province of Cagayan, is situated in the northwest region of the said province. A total of 234 square kilometers, or around 23,400 square meters, of land make up the municipality. Regarding the Profile of the Municipality of Lasam as to Cacao Production, the Municipal Agriculturist Office of the municipality of Lasam, Cagayan, Philippines, showed that cacao plantations with around 58,528 trees, including 16, 537 plants that are fruit bearing (Madarang *et al.*, 2019).

The municipalities recognized as having substantial cacao production areas were Lal-lo, Gattaran, Gonzaga, and Sta Teresita in District 1, Lasam, Sta. Praxedes and Sanchez Mira (District II), as well as Peablanca and Rizal (District III) (Gonzales *et al.*, 2018). This project started at Nabannagan West, a barangay in the Municipality of Lasam, Cagayan Province, Philippines.

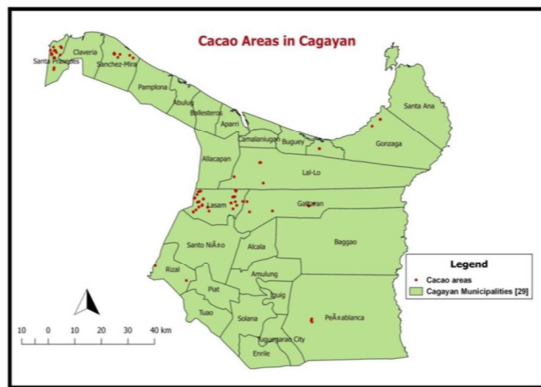


Fig. 1. Cacao Areas in Cagayan.

Conceptual Framework

Presented in the fig. is the framework of this research titled: School + Home Cacao Project Towards Improved Livelihood, Literacy And Climate Resiliency: A Community-Based Participatory Cacao Processing Enterprise Model in a Municipality in Cagayan Province. This study seeks to combine community efforts, notably those of the school and home, to construct cacao learning sites with demonstration and processing facilities for enhanced livelihood, health, literacy, and climate resiliency.



Fig. 2. Conceptual framework of the study.

This project's central objective is to construct School Plus Home Cacao Processing Learning Sites. Its specific goals are to: (1) Provide livelihood to communities through cacao and vegetable gardening, and cacao-value adding products to address the nutritional needs of school children; (2) Provide trainings and interventions to increase knowledge, skills and attitudes of school children, teachers and parents on cacao production, processing and nutrition; (3) Showcase cacao food processing technologies as alternative source of income for the community to alleviate poverty; and (4) Integrate the value of Cacao gardens towards livelihood (kabuhayan), health (kalusugan), literacy (karunungan) and climate resiliency (kalikasan).

Materials and Methods

Research Design

The researchers primarily used a community-based participatory action research design. PAR, also known as community-based participatory action research, is a people-centered, power-conscious, action-oriented kind of action research. PAR is unusual in that it allows "research participants" to actively develop forms of action in response to unmet needs or unpleasant conditions, while also creating and

forming actual communities of practice (Robinson *et al.*, 2019). To conduct this type of investigation, the researchers needed to: (1) assess and select school and group participants; and (2) profile and characterize the selected school and group participants in order for the researchers to facilitate advocacy awareness and trainings on cacao production and processing, design school + cacao (S+C) learning sites, and present the design lay-out of cacao (S+C) learning sites.

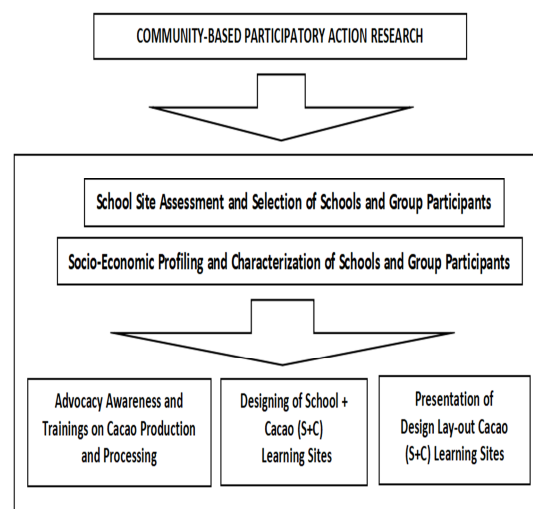


Fig. 3. Research Framework of the community-based participatory action research.

### Respondents

The study's participants were 15 parents and guardians of Nabannagan National High School students who were interested in cocoa production and processing for additional revenue and community development. The study's subjects were all from Nabannagan West, Lasam, Cagayan, which is one of Lasam's barangays. The population was 2,671 according to the 2020 Census. This represented 6.48% of Lasam's total population. The household population of Nabannagan West was 2,725 in 2015, divided into 609 households, with an average of 4.47 people per household.

### Procedures

To carry out this project, the following steps were followed: First, permission and collaboration were obtained from the barangay captain of Nabannagan West and the principal of Nabannagan National High School. Second, after receiving authorization, the researchers evaluated the school and group members. Third, socioeconomic profiling and characterisation of schools and group participants were accomplished by human interaction with respondents via questionnaires. Fourth, in Nabannagan National High School, the school and home cacao learning sites were launched as a demonstration and processing area of livelihood, health, literacy, and climate resiliency. Fifth, the researchers conducted interviews with the respondents to identify the issues they encountered during the cocoa production process. Finally, the acquired data was collated, arranged, and statistically analyzed. In addition, the researcher provided orientation to study participants. The researcher strictly followed the ethical research guidelines. The results have been analyzed, interpreted, and reported on.

### Ethical Considerations

This project was founded on the following research ethics considerations. First, the principal of Ignacio B. Jurado Elementary School and the barangay captain of Ignacio B. Jurado received a letter of consent. Second, prior to project administration, the researcher delivered an orientation on the study's goals. Third, the respondents' privacy was maintained by withholding their identities in compliance with the

Data Privacy Act. Finally, the IATF regulations were scrupulously adhered to throughout the process.

## Results

### School Plus Home Cacao Learning Sites

In Nabannagan National High School, the School Plus Home (S+H) Cacao Learning Sites were effectively introduced as a processing and demonstration area of livelihood, health, literacy, and climate resiliency. Students, researchers, academic members, community leaders, parents, farmers, and out-of-school adolescents engaged in the project of CSU Lasam.



**Fig. 4.** Launching of the Project.



**Fig. 5.** Planting of Cacao Trees.

### Profile of the Respondents

The project comprises 15 participants from Nabannagan West, Lasam, Cagayan. Nabannagan West is a barangay in the municipality of Lasam, Cagayan province. According to the 2020 Census, its population was 2,671. This accounted for 6.48% of Lasam's total population. In the 2015 Census, the household population of Nabannagan West was 2,725 divided into 609 homes, with an average of 4.47 individuals per household. Farming is the primary source of income for the residents of Barangay Nabannagan West. Table 1 shows the demographics of the respondents.

**Table 1.** Age and sex of the respondents.

Profile Variables	Categories	Frequency (N=15)	Percentage
Sex	Male	9	60
	Female	6	40
Age	21-30	2	13.33
	31-40	1	6.67
	41-50	4	26.67
	51-60	4	26.67
	61-70	4	26.67

Table 1 shows the respondents' ages and genders. As can be seen, there were more men (9 or 60%) than women (6 or 40 percent). Cacao cultivation is still seen as a male-dominated activity. This explains why males are often portrayed as farmers, whilst women are portrayed as their helpers who care for the children and the house. For the age of the participants, a total of four or 26.67% of respondents were aged between 41-50. Also, four or 26.67% were aged 51-60, four or 26.67 likewise belonged to the age group 61-70, followed by a total of two or 13.33% of respondents aged 21-30, and the least, one or 6.67% of the respondents belongs to the age group 31-40.

**Table 2.** Ethnicity and Type of Family.

Profile Variables	Categories	Frequency (N=15)	Percentage
Ethnicity	Ilocano	14	93.33
	Bisaya	1	6.67
Type of Family	Nuclear	10	66.67
	Extended	5	33.33

Table 2 shows the ethnicity and family type. As can be seen, practically all of the responses (14 or 93.33%) are Ilocanos, with only one Bisaya (1 or 6.67%). The majority of responders (10 or 66.67%) have nuclear families, while the remaining 5 or 33.33% have extended families.

**Table 3.** Civil Status and Highest Educational Attainment.

Profile Variables	Categories	Frequency (N=15)	Percentage
Civil Status	Single	1	6.67
	Married	13	86.67
	Widow/Widower	1	6.67
Highest Educational Attainment	Elementary level	3	20
	High School Level	2	13.33
	High School Graduate	7	46.67
	College Level	2	13.33
	College Graduate	1	6.67

According to Table 3, 13 respondents (86.67 percent) are married, followed by a widow/widower (1 or 6.67 percent) and a single person (1 or 6.67 percent). Because having a family means having a source of income to support family members, married respondents are more likely to work in agriculture. Table 3 also includes information on educational attainment. It can be perceived that 7 or 46.67% of the respondents are high school graduates, over those who have reached an elementary level (3 or 20%), high school level (2 or 13.33%), college-level (2 or 13.33%), and who is a college graduate (1 or 6.67%). This suggests that the vast majority of respondents who worked in agriculture were educated beyond the elementary level and were literate.

**Table 4.** Home Ownership and Home Condition.

Profile Variables	Categories	Frequency (N=15)	Percentage
Home Ownership	Owned	15	100
	Staying with parents/relatives	0	0
Home Condition	Concrete	4	26.67
	Combination of concrete and wood	11	73.33

Table 4 displays the respondents' comments on the ownership and condition of their home. As can be seen, all of the participants (15 or 100%) own their homes. In terms of home condition, more respondents (11 or 73.33%) indicated that their home is composed of a combination of concrete and wood components than those who reported that their home is made entirely of concrete (4 or 26.67%).

**Table 5.** Number of Rooms, Kitchen, Fuel Used, and Lighting.

Profile Variables	Categories	Frequency (N=15)	Percentage
Number of Rooms	Adequate	15	100
	Inadequate	0	0
Kitchen	Separate	4	26.67
	Attached to rooms/house	11	73.33
Fuel Used	Gas	1	6.67
	Wood	3	20
Lighting	Combination of gas and wood	11	73.33
	Electricity	14	93.33
	Solar	1	6.67

Table 5 shows the number of rooms, location of the kitchen, fuel utilized, and illumination. All (15 or 100%) of respondents stated that their rooms are adequate for them. In terms of kitchen placement, more respondents (11 or 73.33%) said their kitchens are connected to their rooms/houses than those who said they are separate (4 or 26.67%). The majority of responders (11 or 73.33%) use a combination of gas and wood as their fuel, followed by wood (3 or 20%) and gas (1 or 6.67%). When it comes to illumination, nearly all respondents (14 or 93.33%) use electricity, while the remaining responder (1 or 6.67%) utilizes solar.

**Table 6.** Bathroom, Toilet, and Drainage.

Profile Variables	Categories	Frequency (N=15)	Percentage
Bathroom	Within the house	13	86.67
	Outside the house	2	13.33
Toilet	Flush	7	46.67
	Water Sealed	7	46.67
	Pit-type	1	6.67
Drainage	Open canal	12	80
	Closed	3	20

Table 6 displays the respondents' bathroom location, toilet type, and drainage system type. The majority of respondents (13, or 86.67 percent) claimed their restrooms are inside their residences, while the remainder said their bathrooms are outside (2 or 13.33 percent). When it comes to toilets, 7 or 46.67% flush, 7 or 46.67% use a water-sealed toilet, and the remaining responder (6.67%) uses a pit-type toilet. Only 3 percent of respondents had closed drainage systems, leaving open canals as the most common type of drainage system (12 percent, or 80%).

**Table 7.** Water Supply, Sufficiency of Water Supply, and Quality of Water Supply.

Profile Variables	Categories	Frequency (N=15)	Percentage
Water supply	manual pump well	14	93.33
	electric	1	6.67
Sufficiency of water supply	sufficient	13	86.67
	insufficient	2	13.33
Quality of water supply	potable	13	86.67
	unsafe	2	13.33

Furthermore, nearly all (14 or 93.33% of respondents) acquire their water through manual pump wells. The remaining respondent (1 or 6.67%) uses an electric

type of well. Furthermore, as shown in Table 7, nearly all of the respondents (13, or 86.67 percent) stated that their water supply was sufficient. Only two people, or 13.33 percent, stated that their water supply was insufficient. Thirteen out of fifteen respondents, or 86.7 percent, indicated they had access to potable water supplies, while two respondents, or 13.33%, said the water quality in their homes was unsafe.

**Table 8.** Main Source of Income and Area Cultivated.

Profile Variables	Categories	Frequency (N=15)	Percentage
Main Source of Income	Crop Production	9	60
	Combination of Crop and Animal Production	3	20
	Others	3	20
	0-1 ha.	3	20
Area Cultivated in hectares	1-2 ha.	6	40
	2-3 ha	2	13.33
	4-5 ha	1	6.67
	None	3	20

Table 8 shows the principal source of income for the respondents. The majority of respondents (9 or 60%) rely primarily on crop production for their income, as opposed to those who rely on crop and animal production (3 or 20%) as well as other sources of revenue (3 or 20%). In terms of hectares cultivated, six or 40% claimed to cultivate 1-2 hectares, three or 20% claimed to cultivate 0-1 hectare, three or 20% claimed that they do not have land area to cultivate, two or 13.33% claimed to cultivate 2-3 hectares, and a respondent (6.67%) claimed to cultivate 4-5 hectares.

**Table 9.** Reasons of interests and discouragement in Cacao Production.

Questions	Reasons	Frequency (N=15)	Percentage
Reasons why you are interested in Cacao production?	It provides additional food	1	6.67
	It provides additional income	14	93.33
Reasons why you are discouraged to engage Cacao production?	Higher possibility for bankruptcy	3	20
	No reasons	11	73.33
	Lack of knowledge in cacao	1	6.67

Cacao is viewed as a possible economic enterprise by the majority of respondents in Nabannagan West, as indicated in Table 9, which represents the respondents' perspectives on cacao production, specifically their interests and discouragement in producing cacao as a livelihood. Almost all respondents (14 or 93.33%) said that cacao cultivation provides them with an additional source of income, followed by respondents who reported that cacao production provides them with additional food (1 or 6.67%). For the reasons why the participants are discouraged from engaging in cacao production, the majority of them (11 or 73.33%) stated that there is no reason to be discouraged in producing cacao as a livelihood. In comparison, three or 20% stated that there is a high possibility for bankruptcy, followed by a lack of knowledge in cacao production (1 or 6.67%).

#### *Problems Encountered in Cacao Production*

The problems that the research participants encountered lay the groundwork for upgrading and optimizing cocoa production. In general, respondents highlighted high production costs and labor scarcity as the two most significant barriers to cocoa production. It was stated that the high cost of cacao seeds caused problems during the early phases of production. Fertilizer and pesticides, in addition to the high cost of seeds, are said to be highly expensive by the participants. Respondents stated that due to a labor shortage, they are overworked as a result of their small group and lack the manpower for more effective cocoa manufacture. Because the younger generation is uninterested in working in agriculture, the majority of responders are middle-aged individuals or older.

#### **Discussion**

The post-2015 development agenda for the Millennium Development Goals (MDGs) and the Sustainable Development Goals placed a high priority on reducing poverty (SDGs). And inequality was added to the latter (Wan & Wang, 2019). Because people and families lack access to basic essentials, poverty is a worldwide socioeconomic problem (Cudia, 2019). Poverty is still an issue in the Philippines for the population (Skoufias *et al.*, 2019; Tingzon *et al.*, 2019).

Despite its greatest efforts, the Philippines remains behind its Southeast Asian neighbors in the fight against poverty, with over 22 million Filipinos living below the national poverty line (Philippine Statistics Authority, 2018). Furthermore, for the past 50 years or so, the Philippines' economic development and growth have been characterized by a boom and bust cycle (Asian Development Bank, 2007). As a result, several Philippine administrations have failed to reduce poverty (Agbola *et al.*, 2017; Albert & Martinez, 2015).

In response to the identified challenges, the researchers decided to launch the school plus home cacao project for improved livelihood and climate adaptation, which is a community-based cocoa participatory cacao processing enterprise model. It establishes a partnership between the school and the community in order to increase the number of cacao plants in the area and produce safe and nutritious cacao products, providing residents with more income and better health. Furthermore, cocoa tree farming may help to regenerate land, preventing floods, soil erosion, disturbing hydrological systems, and possibly extinction of species. Through trainings and interventions, the project also hopes to raise community awareness about cacao farming, processing, and nutrition. To recap, the project provides a source of income, increased health, literacy, and climatic adaptation, all of which are incredibly valuable given the current need. Having said that, the project endorses the SDGs, which advocate for the inclusion of quality education, climate action, zero hunger, and zero poverty as cornerstones of global progress.

According to the findings which summarizes the respondents' opinions on cacao production, particularly their interests and discouragements in producing cacao as a livelihood, the majority of respondents in Nabannagan West see cacao as a potential economic venture. Almost all of the respondents (14, or 93.33%) claimed that growing cacao gives them an additional source of revenue. This was followed by a respondent who said that producing cacao gives them an additional supply of food (1, or 6.67%).



Additionally, the majority of the participants (11 or 73.33%) said that there is no reason to be discouraged from growing cacao as a source of income when asked why they are discouraged from doing so.

This finding is in line with study of Tuates *et al.*'s (2020) research, which examined the creation of enterprises processing cacao byproducts in important cacao-producing regions. According to the study, the creation of cacao products brings in an additional Php 8 to Php 12/kg of wet beans. Also, literature on cacao supports the data gathered by the study as cacao is stated as an economically significant agricultural product for millions of people worldwide. Around 6 million farmers cultivate it worldwide, and more than 40 million people depend on it for their livelihoods (Beg *et al.*, 2017). Around 80 to 90 percent of the world's cocoa crop is produced by smallholder farmers (World Cocoa Foundation, 2014). Cacao is also the second-largest cash crop in the tropics and the world's third-largest agricultural export (Daz-Montenegro *et al.*, 2018). More than 80% of the world's chocolate is produced by 7-8 million little family-run cacao farms in more than 50 countries (ECLAC *et al.*, 2015).

### Conclusion

School + Home Cacao Learning Sites as Demonstration and Processing Areas Livelihood, Health, Literacy, and Climate Resiliency is a project in collaboration with Cagayan State University-Lasam Campus to teach school and community to produce cacao that can serve as a source of income for the community. Cacao is beneficial not only for monetary gain, but also for the environment and consumer health. This project, which has been established by the CSU-Lasam campus, will serve as a starting point for advancement not only for the Campus, but for everyone.

### Recommendations

A promising project was School + Home Cacao Learning Sites as Demonstration and Processing Areas for Livelihood, Health, Literacy, and Climate Resiliency at IJB Elementary School. The community's and LGU's awareness of, and support

for, the project's objectives, aims, and outcomes should be increased. To summarize, cacao production should be valued since, as long as everyone helps each other, it may be beneficial for us to have enough revenue and, of course, to save our environment.

### References

**Agbola FW, Acupan A, Mahmood A.** 2017. Does microfinance reduce poverty? New evidence from Northeastern Mindanao, the Philippines. *Journal of Rural Studies* **50**, 159-171.

**Albert JRG, Martinez A.** 2015. Is poverty really decreasing, and if not, why not?.

**Andriesse E.** 2018. Primary sector value chains, poverty reduction, and rural development challenges in the Philippines. *Geographical Review* **108(3)**, 345-366.

**Asian Development Bank.** 2007. Philippines: Critical Development Constraints. Asian Development Bank, Manila.

**Beg MS, Ahmad S, Jan K, Bashir K.** 2017. Status, supply chain and processing of Cocoa - a review. *Trends Food Sci. Technol* **66**, 108-116.

**Camba AL.** 2020. Estimating the nature of relationship of entrepreneurship and business confidence on youth unemployment in the Philippines. *The Journal of Asian Finance, Economics and Business* **7(8)**, 533-542.

**Capanzana MV, Aguila DV.** 2020. Philippines case study: government policies on nutrition education. In *Nutrition Education: Strategies for Improving Nutrition and Healthy Eating in Individuals and Communities* **92**, 119-129. Karger Publishers.

**Chulanova Z, Satybaldin A, Koshanov A.** 2019. Methodology for Assessing the State of Human Capital in the Context of Innovative Development of the Economy: A Three-Level Approach. *Journal of Asian Finance, Economics and Business* **6(1)**, 321-328.

- Cudia CP, Rivera JPR, Tullao TS.** 2019. Alleviating poverty in the Philippines through entrepreneurship. *DLSU Business & Economics Review* **28(3)**, 121-130.
- Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI).** 2015. Philippine Nutrition Facts and Fig.s 8th National Nutrition Survey Dietary Survey. ISSN 1655-2911.
- Díaz-Montenegro J, Varela E, Gil JM.** 2018. Livelihood strategies of cacao producers in Ecuador: Effects of national policies to support cacao farmers and specialty cacao landraces. *Journal of rural studies* **63**, 141-156.
- ECLAC, FAO, IICA.** 2015. The Outlook for Agriculture and Rural Development in the Americas: a Perspective on Latin America and the Caribbean 2015-2016. Economic Commission for Latin America and the Caribbean.
- FAO, IFAD, UNICEF, WFP and WHO.** 2017. The State of Food Security and Nutrition in the World 2017. Building resilience for peace and food security. Rome, FAO (accessed at <http://www.fao.org/3/a-I7787e.pdf>).
- Gamelong JAM.** 2018. Exploring High Rate Malnutrition among Children in a Selected Barangay in Silang, Cavite. In Abstract Proceedings International Scholars Conference **6(1)**, 68-68.
- Holden W, Nadeau K, Porio E.** 2017. The Philippines: Understanding the Economic and Ecological Crisis. In *Ecological Liberation Theology* pp. 5-9. Springer, Cham.
- Montes MF.** 2018. The Philippines as an unwitting participant in the Asian economic crisis. In *Asian Contagion* pp. 241-268. Routledge.
- Pasion PA.** 2019. "It Takes a Village to Raise a Child": Malabon City in the Philippines Mobilizes to Reduce Malnutrition Rates 2013-2018.
- Perez GJ, Comiso JC, Aragonés LV, Merida HC, Ong PS.** 2020. Reforestation and deforestation in Northern Luzon, Philippines: Critical issues as observed from space. *Forests* **11(10)**, 1071.
- Robinson DB, Robinson IM, Currie V, Hall N.** 2019. The Syrian Canadian sports club: A community-based participatory action research project with/for Syrian youth refugees. *Social Sciences* **8(6)**, 163.
- Ross AG, Papier K, Luceres-Catubig R, Chau TN, Inobaya MT, Ng SK.** 2017. Poverty, dietary intake, intestinal parasites, and nutritional status among school-age children in the rural Philippines. *Tropical Medicine and Infectious Disease* **2(4)**, 49.
- Rubin MA.** 2020. Rebel territorial control and civilian collective action in civil war: Evidence from the communist insurgency in the Philippines. *Journal of Conflict Resolution* **64(2-3)**, 459-489.
- Salvacion A.** 2017. Exploring determinants of child malnutrition in Marinduque Island, Philippines. *Human Ecology* **45(6)**, 853-863.
- Shahanas E, Panjikkaran ST, Aneena ER, Sharon CL, Remya PR.** 2019. Health benefits of bioactive compounds from cocoa (*Theobroma cacao*). *Agricultural Reviews* **40(2)**, 143-149.
- Skoufias E, Kawasoe Y, Strobl E, Acosta PA.** 2019. Identifying the vulnerable to poverty from natural disasters: the case of typhoons in the Philippines. World Bank Policy Research Working Paper (8857).
- Tingzon I, Orden A, Go KT, Sy S, Sekara V, Weber I, ... Kim D.** 2019. Mapping poverty in the philippines using machine learning, satellite imagery, and crowd-sourced geospatial information. *International Archives of the Photogrammetry, Remote Sensing & Spatial Information Sciences*.
- Tuates Jr AM, Calica GB, Testa MF, Carriedo AG, De Leon AM, Capariño OA.** 2020. Establishment of village-type cacao by-products processing enterprise in major cacao producing areas. *Asian journal of postharvest and mechanization* **3(1)**, 1.

**Ulep VGT.** 2021. Breaking the Curse: Addressing Chronic Malnutrition in the Philippines Using a Health System Lens.

**Vargas M, Ducay AJ, Duante C, Angeles-Agdeppa I, Dasco M, Capanzana M.** 2018. The Double Burden of Malnutrition in the Philippines: Trend from National Nutrition Surveys 1989-2015 (No. IAEA-CN--268).

**Wan G, Wang C.** 2019. Poverty and inequality. *Asian Transformations* 240-266.

**Wickramasuriya AM, Dunwell JM.** 2018. Cacao biotechnology: current status and future prospects. *Plant biotechnology journal* **16(1)**, 4-17.

**World Cocoa Foundation.** 2014. Cocoa market update.