

**STATUS OF AGROFORESTRY FARMERS IN BARANGAY MAGSAYSAY,  
TALIBON, BOHOL**

**College of Agriculture and Natural Resources  
BOHOL ISLAND STATE UNIVERSITY  
Zamora, Bilar, Bohol**

**ZULEIKA A. SEREÑO**

**June 2022**

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A Thesis  
Presented to the Faculty of the  
College of Agriculture and Natural Resources  
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BOHOL ISLAND STATE UNIVERSITY  
Zamora, Bilar, Bohol

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In Partial Fulfilment  
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Bachelor of Science in Forestry

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ZULEIKA A. SEREÑO

June 2022

## APPROVAL SHEET

The thesis entitled “**STATUS OF AGROFORESTRY FARMERS IN BARANGAY MAGSAYSAY, TALIBON, BOHOL**” prepared and submitted by Zuleika A. Sereño in partial fulfillment of the requirements for the degree Bachelor of Science in Forestry has been examined and recommended for acceptance and approval for oral defense.

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## ABSTRACT

Agroforestry project from Department of Environment and Natural Resources is designed to uplift the livelihood status of the beneficiaries, hence a study was conducted in Barangay Magsaysay, Talibon, Bohol to assess the income of the respondents before and after the implementation of the project. Data was gathered through an interview using a survey questionnaire. The majority of the respondents were males between the ages of 61 and 70, with 3 to 5 children, most of whom are married and have barely completed high school. Houses were made of concrete and local materials, and the majority of them relied on firewood for cooking, electricity for lighting, and a deep well for water. The majority of the farmers own between 1.1 and 2 hectares of land. After the project implementation there was an increase of income and it can be attributed to the membership and participation of the respondents to the CBFM agroforestry project. Moreover, farmers adopted the practice of intercropping, increasing the rate of crop production. The problems identified were related on pest and diseases, poor transportation network, inadequate tools and machinery, inadequate agricultural education and extension, unavailability of good quality of seeds, unpredictable climate and poor irrigation facilities.

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## Chapter 1

### THE PROBLEM AND ITS SCOPE

#### Rationale

The agroforestry and agriculture sector responds to our public needs by ensuring food security for every Filipino. Yet despite their crucial role, Filipino farmers remain among the poorest and most disadvantaged groups in our society. The high level of poverty among our farmers also makes them highly at risk for the effects of these crises. Some [farmers] express that they do not want to see their children following in their footsteps, because they do not want them to suffer the same fate.

With those problems the response of the government sector especially to the Department of Environment and Natural Resources to this problem is to allow the Community-Based Forest Management (CBFM) program to bring benefits to upland farmers through the implementation of livelihood and agroforestry projects in the area. Its motto is "people first and sustainable forestry will follow" which aims to achieve sustainable management of forests and forest resources alongside the promotion of social justice. It also aims to improve the well-being of local communities and give recognition to upland communities through POs as partners in the protection, development and management of forestlands. Agroforestry also play a vital role to meet the need of the growing population in terms of sustaining crop agriculture and livestock, production of commodities for exchange and as a

form of energy and providing diverse tree products for sustaining rural livelihoods (Chew, 2001; Arnold, 1997).

Socioeconomic status is the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation. Examinations of socioeconomic status often reveal inequities in access to resources, plus issues related to privilege, power and control. SES affects overall human functioning, including our physical and mental health. Low SES and its correlates, such as lower educational achievement, poverty and poor health, ultimately affect our society. On the other hand agriculture and agroforestry is considered as the backbone of our society, every year we face a crisis. From natural calamities to social and political turbulence, it is said that the Philippines consistently ranks among the riskiest countries in the world (Habacon 2021).

The general objective of this study is to assess the present status of the people that have been involved in the project, especially the farmers of the reforestation strategy by the government to determine whether the socioeconomic and environmental benefits encourage further adoption or practice by upland farmers. To make the study more useful, the researcher also thought it necessary to come up with recommendations on how to make it more viable and sustainable technically and policy-wise.

## Literature Background

Much has been written about the severe deforestation which has taken place in the Philippines, particularly since World War 2, and of the dire need for reforestation for welfare and livelihood purposes (Kummer and Sham 1994, Pulhin 1998, Utting 2000, Guiang 2001, UNFAO and FMBDENR 2003). Large areas of forest were felled under timber license agreements in earlier years, and more recently kaingin farming (shifting cultivation) and illegal logging has taken place on remnants and logged over areas. While the Department of Environment and Natural Resources (DENR) and smallholder communities attempt to control illegal logging, this remains a difficult challenge, and in insurgency areas the government has limited control over forest exploitation.

In order to replace lost trees, protect watersheds, produce timber and non-wood forest products, and gain community involvement in protection of forests, a number of forestry assistance programs have been introduced by the Philippines government, drawing on financial assistance from domestic and foreign governments and non-government organizations (NGOs).

Government programs in the early 1980s were geared towards containing deforestation by providing upland communities with incentives to participate in growing, instead of clearing, forests. The Integrated Social Forestry Program (ISFP) implemented in 1982 provided long-term land security through 25-year stewardship contracts to qualified forest occupants. designed to maximize land productivity, enhance ecological stability and improve socioeconomic conditions of

forest occupants and communities. The ISFP 'was launched to consolidate all previous people oriented programmes' (Groetschel et al. 2001, p. 61), and was to be the major support program for people-oriented forestry. The ISFP is one of several people-oriented forestry programs that have been integrated under the Community-based Forest Management (CBFM) Strategy of government, promulgated in 1995 through Presidential Executive Order No. 263.

The Executive Order No. 263, (EO 263), entitled "Adopting Community Based Forest Management as the National Strategy to Ensure the Sustainable Development of the Country's Forestlands Resources and Providing Mechanisms for its Implementation" issued by the President of the Republic of the Philippines on 19 July 1995. The strategy is the organised efforts of the government to work with communities in and near public forests aimed to protect, rehabilitate, manage, conserve and utilise the resources. E.O. 263 and its implementing rules and regulations stipulate the basic policy objectives that CBFM intends to pursue. These are to: 1) protect and advance the rights of the Filipino people to a healthy environment; 2) improve socio-economic conditions through the promotion of social justice and equitable access to and sustainable development of forestland resources; and 3) respect the rights of indigenous peoples to their ancestral domains by taking into account their customs, traditions and beliefs in the formulation of laws and policies. To achieve these objectives, the CBFM Program was established through Department of Environment and Natural Resources Administrative Order No. 96-29 that integrated and unified all the people-oriented programs of the government including the Integrated Social Forestry Program;

Upland Development Project; Forest Land Management Program; Community Forestry Program; Low Income Upland Communities Project; Regional Resources Management Project; Integrated Rainforest Management Project; Forestry Sector Project; Coastal Environmental Program; and Recognition of Ancestral Domains/Claims.

On the other hand on November 11, 2005 a DENR Administrative Order No. 2005- 25 which is "GUIDELINES IN THE IMPLEMENTATION OF UPLAND AGROFORESTRY PROGRAM" With the objectives: 1) To reduce rural poverty by increasing productivity and employment in the uplands through the development of upland agroforestry farms and plantations nationwide; 2) To enhance forest cover of forestlands by planting economically beneficial crops in addition to timber species; 3) To ensure sufficient supply of agricultural and fruit tree crops through private-public participation and by encouraging all sectors to engage in the development of agroforestry farms and plantations; and 4) To improve the economic well-being of upland people and communities dependent on forests lands and forest resources by ensuring equitable opportunities and access to forest lands and forest resources.

Agroforestry is agriculture with a large tree component. The term is usually used in connection with complex tropical systems, from dry to humid climates, and from lowland to highland, but AF also occurs in temperate areas e.g. as permaculture and shelterbelts. Agroforestry systems are often complex with many species and types of interactions, which develop as trees grow.

In the study of Udawatta et al. (2019) , agroforestry is recognized as a possible partial solution for biodiversity conservation and improvement. The review revealed that floral, faunal, and soil microbial diversity were significantly greater in agroforestry as compared to monocropping, adjacent crop lands, and within crop alleys and some forests. Among the soil organisms, arbuscular mycorrhizal fungi (AMF), bacteria, and enzyme activities were significantly greater in agroforestry than crop and livestock practices. Agroforestry also creates spatially concentrated high-density biodiversity near trees due to favorable soil-plant-water- microclimate conditions. The greater biodiversity was attributed to heterogeneous vegetation, organic carbon, microclimate, soil conditions, and spatial distribution of trees. Differences in biodiversity between agroforestry and other management types diminished with time. Evenly distributed leaves, litter, roots, dead/live biological material, and microclimate improve soil and microclimate in adjacent crop and pasture areas as the system matures. In the study it proves that the integration of agroforestry can improve biodiversity in agricultural lands.

As said by Monteith et al.,(2000) "trees on farm bring about favourable changes in the microclimatic conditions by influencing radiation flux, air temperature, wind speed, saturation deficit of understory crops all of which will have a significant impact on modifying the rate and duration of photosynthesis and subsequent plant growth, transpiration, and soil water use". Shade tree performs a good role in moderating the temperature, humidity, evapotranspiration of that locality on which either trees are scattered or on bund of agricultural crops under

the agroforestry system. According to SteffanDewenter et al. (2007) the removal of shade trees increased soil surface temperature by about 40C and reduced relative air humidity at 2 m above ground by about 12%. Shelterbelt and windbreak also perform protecting functions in terms of beneficial aspects of microclimate change are extensively used. Based on the response of crops to shade, Brenner (2000) has classified leafy horticultural crops as the most responsive crops and cereals as moderately responsive or less responsive. The net shade effect was reported to be more positive when the annual crop is a C3 plant which is normally light saturated in the open (Ong, 1999).

The property of soil under agroforestry practices depends on tree species and their intercropping pattern, management practices, arrangement direction and the quantity and quality of litter and their decay rate. Trees are simultaneously planted in rows sparsely in the crop field and/or along the allies (bunds). These trees provide food, timber, fuel, fodder, construction materials, raw materials for forest-based small-scale enterprises and other cottage industries and in some cases, enrich soil with essential nutrients (Ghosh et al., 2011). According to Torquebiau and Kwesiga (1999) in agroforestry with *Sesbania sesban*, decreased soil bulk density and improved water infiltration explain better early growth of the subsequent crop. Plantation of trees and crops are a boost to increase or sequester the carbon content of the soil which helps to beat the problem of climate change and global warming. As per Kumar et al. (2006) increase in soil carbon through plantations may also act as an important carbon sink. Biodrainage trees played a major role in combating the water logging condition. Chowdhury et al.

(2011) has reported that biodrainage plantation might have improved the soil aeration, nutrient use efficiency and reduced sulphide toxicity. Agroforestry models also help in reclamation of salt affected soil. Generally, agroforestry practices increase the soil organic matter through leaf litter addition. It maintains the population dynamics of beneficial microorganisms and improves biological nitrogen fixation in soil. All microbiological activity in soil contributes to cycling of nutrients and other ecosystem functions and all soil functions contribute to ecosystem services. Recycling in the natural system is one of the many ecosystem services that sustain and contribute to the wellbeing of human society (Jhariya and Raj, 2014).

As claimed by Nair et al. (2009) under the agroforestry system carbon sequestration has potential to mitigate the greenhouse gases because of greater efficiency of resource (nutrients light and water) capture and utilization. Moreover, reforestation and agroforestry systems offer perhaps the greatest potential to remove large quantities of carbon from the atmosphere. However, to Sudha et al. (2007) agroforestry is an attractive option for climate change mitigation as it sequesters carbon in vegetation and soil, produces wood, serving as substitute for similar products that are unsustainably harvested from natural forests, and also contributes to farmers' income. Similarly, according to Kursten (2000) agroforestry can, arguably, increase the amount of C stored in lands devoted to agriculture, while still allowing for the growing of food crops. According per given report of FAO (2007) the total C content of forests has been estimated at 638 Gt for 2005, which is more than the amount of carbon in the entire atmosphere.

## Statement of the Problem

The general objective of this study is to assess the status of the CBFM Agroforestry program of the Department of Environment and Natural Resources (DENR) on the farmers' socioeconomic status in Magsaysay, Talibon Bohol.

It aimed to answer the following questions:

1. What is the demographic profile of the respondents in terms of;
  - 1.1 Age,
  - 1.2 Gender,
  - 1.3 Educational attainment,
  - 1.4 Occupation,
  - 1.5 Source of Income, and,
  - 1.6 Household Composition?
2. What is the gross annual income of the farmers before and after agroforestry was implemented?
3. What is the type of agroforestry systems they have?
4. What are the machineries invested derived from agroforestry income?
6. What is the livestock pastured, fruit trees and crops grown in the farm?
7. What are the problems encountered in farming and its possible interventions.

## Significance of the study

The findings of this study shall provide valuable insights to the following groups and individuals:

**Academe.** The results of this study would help the Bohol Island State University, especially the Forestry and Environmental Science Department (FESD) students and other institutions to be involved in new trends when it comes to research. This would be useful for the staff and researchers of the concerned institution to conduct further research and community extension activities.

**Economic Impact.** This study may provide ample information about the socio-economic impact of the Agroforestry practice wherein managing bodies and future studies will benefit on the data that this study will provide. Improvement projects, livelihood and recreational activities may be proposed with the help of this study.

**Researchers.** They would be encouraged to conduct the same study using different methods or replicate this study. Advanced research studies would be pursued on different dimensions in the field of research.

**Department of Environment and Natural Resources.** The Department of Environment and Natural Resources (DENR) would benefit from this study. This would contribute and even served as references for their future research. Also it will help promote project creation for development and livelihood or possible mitigation of environmental issues resulted from socio-economic impacts.

**Community.** The community would be encouraged to continue the practice of agroforestry as a form of (more) sustainable agriculture. The results of this study would be useful for the locals since this will give awareness to the governing bodies about their socio-economic status. This will give a possibility for local livelihood

programs, activities or business opportunities that may be implemented to improve their income.

## RESEARCH METHODOLOGY

### Environment

The study was conducted in Barangay Magsaysay, Talibon Bohol last December 2021 (Figure1). Situated at approximately 10°04'09.1"N, 124°14'55.3"E with an elevation of 83.8 meters or 274.9 feet above mean sea level (PhilAtlas). Talibon has a land area of 140.46 square kilometers or 54.23 square miles which constitutes 2.94% of Bohol's total area. Its population as determined by the 2020 Census was 71,272. This represented 5.11% of the total population of Bohol province, or 0.88% of the overall population of the Central Visayas region.

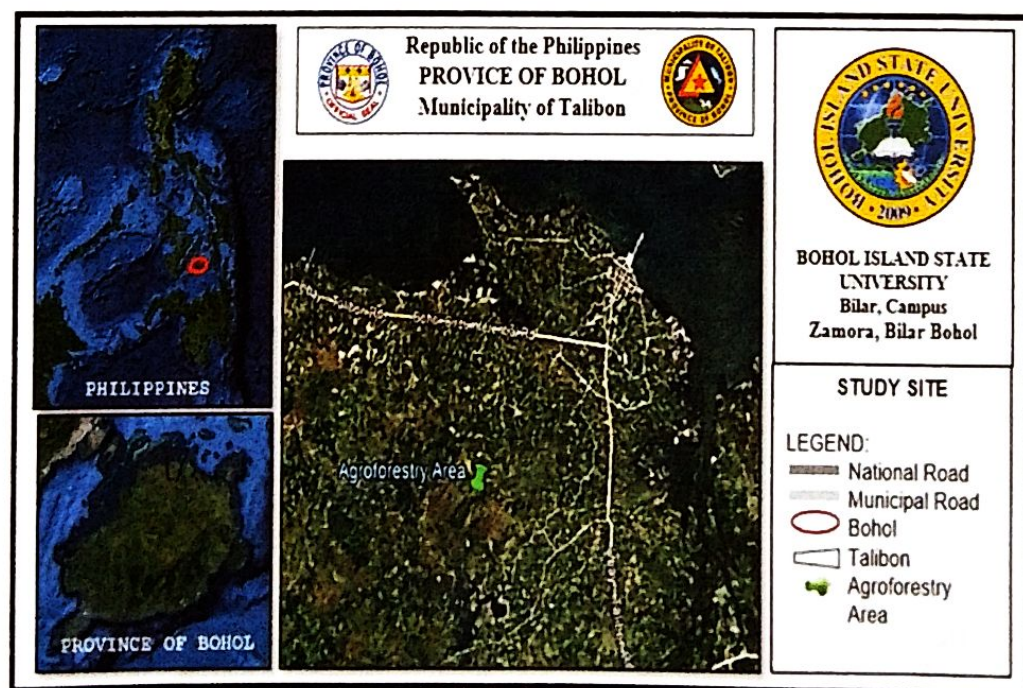


Figure 1. Map indicating the study site within the Municipality of Talibon.

## **Data Gathering**

### **Research Design**

This study utilized the survey method using a semi-structured questionnaire. This method was used to determine the implementation of Status of Agroforestry farmers in Barangay, Magsaysay, Talibon, Bohol. An individual interview was conducted.

### **Instrument**

A semi-structured questionnaire was used during one-on-one interview.

### **Procedures**

#### **A. Coordination with the Project In-Charge**

A courtesy call was made to the P.O. President Mrs. Zenaida Aparece for the permission to conduct the study in their area.

#### **B. Collection of Primary Data**

Primary socioeconomic data was gathered through survey questionnaire. A total enumeration was used as basis for the data collection since there was only 20 members in total. An ocular survey of the project site was initially undertaken to determine the extent and type of agroforestry practices of the farmers in the area. Data gathering was done in December 2021 with the PO President of Magsaysay Agroforestry Farm.

### **C. Collection of Secondary Data**

Right after the coordination, collection of project profile and a secondary data were gathered. Researcher used a secondary information from key informant interviews, recent reports and other documents to have an idea of what transpired before and during project implementation in the site.

### **Statistical Treatment**

Information from individual respondents were encoded in MS Excel spreadsheet. Data were processed and analyzed using descriptive statistics and simple correlations, and results were presented in a form of frequency distribution tables (FDT), or just a simple table.

## DEFINITION OF TERMS

**Agroforestry.** It is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence.

**Baseline data.** It is data that measures conditions before the project starts for later comparison (IFRC, Baseline Basics, 2013)

**Descriptive statistics.** These are used to describe or summarize the characteristics of a sample or data set, such as a variable's mean, standard deviation, or frequency. Inferential statistics can help us understand the collective properties of the elements of a data sample.

**Frequency distribution table.** It is a chart that summarizes all the data under two columns - variables/categories, and their frequency.

**Ocular survey.** Also known as Windshield Survey. Walking around the area allows time to be seen and to see, to absorb the atmosphere of the surrounding.

**Socioeconomic status.** It is the social standing or class of an individual or group. It is often measured as a combination of education, income and occupation.

**Socioeconomics.** It is the social science that studies how economic activity affects and is shaped by social processes. In general it analyzes how modern societies progress, stagnate, or regress because of their local or regional economy, or the global economy.

## Chapter 2

### PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

This study was conducted in Magsaysay, Talibon Bohol. There were a total of 20 beneficiaries in the 50 hectare Agroforestry Project. It was granted in 2015 by the Department of Environment and Natural Resources to address both socio-economic and the environment. All of the members of the P.O. Project were interviewed for this study.

#### Demographic Profile of the Respondents

Thirteen (65%) respondents were male and seven (35%) were female. Most were 61-70 years old which constitutes 35% while only 5% were 71 years and above. Majority or 50% had 3 to 5 number of children while 10% had 9 and above children. Sixty percent (60%) of the respondents were high school level while 15% attained collage level. Most of the respondents (85%) were married and the rest were single, widowed or live-in. And their source of income is through farming. (Table 1)

Table 1  
Profile of the Respondents

|               | Frequency<br>(n) | Percentage<br>(%) |
|---------------|------------------|-------------------|
| <b>Gender</b> |                  |                   |
| Male          | 13               | 65%               |
| Female        | 7                | 35%               |
| <b>Age</b>    |                  |                   |
| 31 - 40       | 4                | 20%               |
| 41 - 50       | 5                | 25%               |

|                               | Frequency<br>(n) | Percentage<br>(%) |
|-------------------------------|------------------|-------------------|
| 51 - 60                       | 3                | 15%               |
| 61 - 70                       | 7                | 35%               |
| 71 years and above            | 1                | 5%                |
| <b>Number of Children</b>     |                  |                   |
| 0-2                           | 3                | 15%               |
| 3 to 5                        | 10               | 50%               |
| 6 to 8                        | 5                | 25%               |
| 9 above                       | 2                | 10%               |
| <b>Educational Attainment</b> |                  |                   |
| Elementary                    | 5                | 25%               |
| High school                   | 12               | 60%               |
| College                       | 3                | 15%               |
| <b>Civil Status</b>           |                  |                   |
| Single                        | 1                | 5%                |
| Married                       | 17               | 85%               |
| Widowed                       | 1                | 5%                |
| Live in                       | 1                | 5%                |
| <b>Main Source of Income</b>  |                  |                   |
| Farming                       | 20               | 100%              |

### Type House Materials

Sixty-five percent (65%) of the respondents were living in a house which was made of the combination of concrete and local materials such as wood and twenty-five percent (25%) was made of pure local materials while the remaining 2 (10%) respondents has a concrete house (Table 2).

Table 2

### Materials Used in House Construction

| Type of House                                  | Frequency<br>(n) | Percentage<br>(%) |
|--|------------------|-------------------|
| Concrete                                       | 2                | 10%               |
| Local Materials                                | 5                | 25%               |
| Combination of Concrete<br>and Local Materials | 13               | 65%               |
| <b>Total</b>                                   | <b>20</b>        | <b>100%</b>       |

### Source of Cooking Fuel, Lighting Facility and Drinking Water

Ninety percent (90%) of the respondents used firewood due to availability of such materials in the locality, and it is also cheap (Table 3). The remaining 2 (10%) uses charcoal however they also consider wood as an alternative firewood. Furthermore, the majority of the respondents (100%) used electricity as the major source in lighting and get their water in the deep well.

Table 3

Fuel Used for Cooking, Source of Lighting, and Source of Drinking Water

| Variable                           | Frequency (n) | Percentage (%) |
|------------------------------------|---------------|----------------|
| <i>Cooking Fuel Used</i>           |               |                |
| Charcoal                           | 2             | 10%            |
| Wood                               | 18            | 90%            |
| <i>Source of lighting facility</i> |               |                |
| Electricity                        | 20            | 100%           |
| <i>Source of drinking water</i>    |               |                |
| Deep well                          | 20            | 100%           |

### Farm size acquired by farmers

Sixty percent (60%) of the respondents have 1.1 to 2 hectare and twenty-five percent (25%) has 2.1 to 3 hectare while the remaining fifteen percent (15%) have 4.1 to 5 hectares in area (Table 4).

Table 4

## Farm size

| Size of Farm<br>(ha) | Frequency | Percentage<br>(%) |
|----------------------|-----------|-------------------|
| 1.1 to 2             | 12        | 60%               |
| 2.1 to 3             | 5         | 25%               |
| 3.1 to 4             | 0         | 0                 |
| 4.1 to 5             | 3         | 15%               |
| <b>Total</b>         | <b>20</b> | <b>100%</b>       |

**Gross Annual Income of 50 hectare Agroforestry Project**

Based on the secondary data collected in 2012 the farmers earned ₱20,000.00 and in 2013 the total income was ₱55,000.00 while in 2014 the farmers have made ₱85,000.00 (Table 5). These low amounts of income were the result of not being engaged into farming as they prefer to have another source of income. Aside from that, most of the fruit trees that they have planted were still young and their lack of education about farming contributes to this result. However, in 2015 when the residents of Magsaysay were granted with land by the government, they started to earn more. In the first year of the project's implementation, the group of farmers have attained ₱136,500.00. It continued to increase in the second year as they earned ₱372,700.00. This time, the fruit trees that they have planted started to bear fruits and some of the farmers pasture animals which added to their income. In 2017 the farmers generated ₱612,400.00 and ₱756,000.00 in 2018. There has been a decrease in income in 2019 due to the pandemic we are dealing

which causes to the decreased in income to only ₱700,000.00 and it continued to decrease in 2020 where they only earned ₱613,500.00 by the end of the year.

Table 5  
Gross Annual Income of Farmers

| Indicators                        | Before        |               | After         |                |                |                |                |                |                |
|-----------------------------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                   | 2012          | 2013          | 2014          | 2015           | 2016           | 2017           | 2018           | 2019           | 2020           |
| <b>Fruit Trees</b>                | 0             | 15,000        | 15,000        | 25,000         | 59,000         | 180,000        | 260,500        | 250,000        | 230,000        |
| <b>Agriculture Crops</b>          | 20,000        | 35,000        | 55,000        | 90,000         | 290,700        | 408,400        | 457,000        | 410,000        | 350,000        |
| <b>Timber Forest Products</b>     | 0             | 0             | 5,000         | 5,000          | 3,000          | 5,000          | 2,000          | 5,000          | 5,000          |
| <b>Non-Timber Forest Products</b> | 0             | 0             | 0             | 1,500          | 0              | 1,000          | 5,000          | 5,000          | 2,000          |
| <b>Pastured Animals</b>           | 0             | 5,000         | 10,000        | 15,000         | 20,000         | 18,000         | 32,000         | 30,000         | 26,500         |
| <b>Total</b>                      | <b>20,000</b> | <b>55,000</b> | <b>85,000</b> | <b>136,500</b> | <b>372,700</b> | <b>612,400</b> | <b>756,500</b> | <b>700,000</b> | <b>613,500</b> |

### Agroforestry Practice

Agricultural crops are intercropped with tree crops in the interspace between the trees. Intercropping is the practice of growing two or more crops in proximity. The most common goal of intercropping is to produce a greater yield on a given piece of land by making use of resources that would otherwise not be utilized by a single crop. The major benefits of intercropping are (1) increasing the rate of crop production, with the advantage of simultaneously decreasing the risk of total crop reduction, and (2) controlling weeds (Liebman and Dyck, 1993).

### Owned/ Acquired Machineries and Vehicle

Majority of the farmers have agricultural hand tools, slashers, rakes, etc.(Table 12). Twenty-eight percent (28%) have hand held and knapsack sprayers, fifteen percent (15%) have acquired motorcycles, nine percent (9%) have water pumps while four percent have hand tractors/power tillers.

Table 6

#### Owned/ Acquired Machineries and Vehicle

| Indicators                      | Frequency |
|---------------------------------|-----------|
| Hand Tractors/Power Tiller      | 2         |
| Agricultural Hand Tools         | 20        |
| Floating/Turtle Tiller          | 0         |
| Hand Held and Knapsack Sprayers | 13        |
| Water Pumps                     | 4         |
| Motorcycle                      | 7         |
| <b>Total</b>                    | <b>46</b> |

### Livestock pastured, fruit trees and crops grown in the farm.

A total of 23 species of plants and 5 species of pastured animals were present in the 50 hectare Agroforestry Project of the Department of Environment and Natural Resources (DENR) in Magsaysay, Talibon Bohol (Table 7). Of these, six (6) types of fruit trees were grown before the project was implemented and five (5) types of fruit trees were added after the project implementation in 2015. The species were categorized into eight (8) families each bearing different types of fruits. Anacardiaceae, Moraceae and Rutaceae are represented by 2 species each and the Arecaceae, Fabaceae, Myrtaceae and Sapindaceae have 1 species each. On Agricultural crops 8 species were planted before and 12 species were currently

sowed. Convolvulaceae have the highest number of species (3), Poaceae has 2 species and the rest families have 1 species which are the Bromeliaceae, Cucurbits, Fabaceae, Legumes, Musaceae, Solanaceae, and Zingiberaceae. Lastly the farmers only pastured 4 species of animals, 2 species on Bovidae and 1 species on Suidae, Leporids, and Phasianidae.

For the timber forest products the respondents believe that they have collected more logs, wood chips, sawdust more than before the agroforestry project the same goes the non-timber forest products where herbs, fuel wood, honey and mushroom can be seen growing in the area.

Table 7  
Fruit trees and Crops Grown in the Farm

| Family Name              | Common Name   | Scientific Name                                       | Before Agroforestry Implemented | After Agroforestry Implemented |
|--------------------------|---------------|---|---------------------------------|--------------------------------|
| <b>Fruit Trees</b>       |               |   |                                 |                                |
| Anacardiaceae            | Mango         | <i>Mangifera indica</i>                               | -                               | √                              |
| Anacardiaceae            | Cashew        | <i>Anacardium occidentale</i>                         | √                               | √                              |
| Arecaceae                | Coconut       | <i>Cocos nucifera</i>                                 | √                               | √                              |
| Fabaceae                 | Tamarind      | <i>Tamarindus indica</i>                              | √                               | √                              |
| Lauraceae                | Avocado       | <i>Persea americana</i>                               | -                               | √                              |
| Moraceae                 | Jack Fruit    | <i>Artocarpus heterophyllus</i><br>Lam.               | √                               | √                              |
| Moraceae                 | Mulberry tree | <i>Morus alba</i>                                     | -                               | √                              |
| Myrtaceae                | Guava         | <i>Psidium guajava</i>                                | √                               | √                              |
| Rutaceae                 | Pomelo        | <i>Citrus maxima</i>                                  | √                               | √                              |
| Rutaceae                 | Lemon         | <i>Citrus limon</i>                                   | -                               | √                              |
| Sapindaceae              | Rambotan      | <i>Nephelium lappaceum</i>                            | -                               | √                              |
| <b>Agriculture Crops</b> |               |   |                                 |                                |
| Bromeliaceae             | Pine apple    | <i>Ananas comosus</i> (L.) Merr.                      | -                               | √                              |
| Convolvulaceae           | Sweet potato  | <i>Ipomoea batatas</i>                                | √                               | √                              |
| Cucurbitaceae            | Squash        | <i>Cucurbita</i>                                      | √                               | √                              |
| Cucurbitaceae            | Bitter Gourd  | <i>Momordica charantia</i> Linn.                      | √                               | √                              |
| Cucurbits                | Watermelon    | <i>Citrullus lanatus</i>                              | -                               | √                              |
| Fabaceae                 | Long beans    | <i>Vigna unguiculata</i> ssp.<br><i>sesquipedalis</i> | √                               | √                              |
| Legumes                  | Peanut        | <i>Arachis hypogaea</i>                               | -                               | √                              |
| Poaceae                  | Rice          | <i>Oryza sativa</i>                                   | √                               | √                              |
| Poaceae                  | Corn          | <i>Zea mays</i> subsp. <i>mays</i>                    | √                               | √                              |
| Musaceae                 | Banana        | <i>Musa paradisiaca</i> Linn.                         | √                               | √                              |

| Family Name             | Common Name | Scientific Name                    | Before Agroforestry Implemented | After Agroforestry Implemented |
|-------------------------|-------------|------------------------------------|---------------------------------|--------------------------------|
| Solanaceae              | Eggplants   | <i>Solanum melongena</i>           | √                               |                                |
| Zingiberaceae           | Ginger      | <i>Zingiber officinale</i>         | -                               | √                              |
| <b>Pastured Animals</b> |             |                                    |                                 |                                |
| Suidae                  | Pig         | <i>Sus scrofa domesticus</i>       | √                               | √                              |
| Bovidae                 | Carabao     | <i>Bubalus bubalis carabanesis</i> | √                               | √                              |
| Bovidae                 | Cow         | <i>Bos taurus</i>                  | √                               | √                              |
| Leporidae               | Rabbit      | <i>Oryctolagus cuniculus</i>       | -                               | √                              |
| Phasianidae             | Chicken     | <i>Gallus gallus domesticus</i>    | √                               | √                              |

Table 8  
Timber and Non-timber Forest Products Found in the Farm

| Indicators                                 | Before Agroforestry Implemented | After Agroforestry Implemented |
|--|---------------------------------|--------------------------------|
| <b>Timber forest products</b>              |                                 |                                |
| logs                                       | √                               | √                              |
| wood chips                                 |                                 | √                              |
| sawdust                                    |                                 | √                              |
| wood                                       | √                               | √                              |
| <b>Non-timber forest product resources</b> |                                 |                                |
| Herbs                                      | √                               | √                              |
| Fuel Wood                                  | √                               | √                              |
| Honey                                      | -                               | √                              |
| Mushroom                                   | -                               | √                              |
| Bush meet                                  | -                               | √                              |

## Problems Encountered in Farming

Most problems identified were related on pest and diseases where it damages crops and food production, parasitizing livestock, or being a nuisance and health hazard to humans (Table 8). Poor transportation network which resulted in low productivity, low income and a fall in the standard of living of rural residents and high rate of poverty (Aloba, 1986) was one of the problems identified by the respondents. Inadequate tools and machinery, unavailability of good quality of seeds which leads to low plant vigor and low germination and unpredictable climate and poor irrigation facilities is also a problem were among the problems cited by the farmers. Possible interventions included pests and diseases control, construction of new feeder roads, provision of subsidies, seed quality improvement, diversifying crop rotations, and most of all, irrigation scheduling.

Table 8

Problems Encountered in Farming and their Possible Interventions

| PROBLEMS                      | POSSIBLE INTERVENTIONS  |
|-------------------------------|---|
| Problem of Pests and Diseases | a. Pests and diseases control units or departments should be established to control pests and diseases.<br><br>b. Insecticides and other chemicals used in the control of pests and |

---

|   |   |
|---|---|
|   | diseases should be supplied at subsidized rates   |
| Poor transportation network                     | Construction of new feeder roads to open up the rural areas.  |
| Inadequate tools and machinery                  | Provision of subsidies to enable farmers purchase modern equipment and tools  |
| Inadequate Agricultural Education and Extension | Efforts should be made ensure that rural and urban dwellers are free or very affordable basic education   |
| Unavailability of good quality of Seeds         | The quality of a seed lot should be improved by conditioning  |
| Unpredictable Climate                           | Diversitifying crop rotations – integrating livestock with crop production system, improving soil quality and minimizing off-farm flows of nutrients. |
| Poor irrigation facilities                      | Irrigation scheduling, adopting practices such as deficit irrigation and conservation tillage.  |

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## Chapter 3

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### Summary of Findings

The study was conducted at the Barangay of Magsaysay, Talibon Bohol, on December 2021 with the primary aim to find out the status of agroforestry farmers. Specifically, it sought to determine the demographic profile of the respondents, invested machineries, gross annual income of the farmers, type of agroforestry being used, and the problems and their possible intervention in farming. A total of 20 farmers were involved during the conduct of the study. Respondents were mostly male, 61-70 years old and with 3 to 5 number of children. Majority attained high school level and married. Farming was their only source of income. Thirteen of the respondents were living in the house made of concrete and local materials, and most of them used fire wood for cooking, used electricity as a source of lighting, and get their water from deep well. Most of the farmers have 1.1 - 2 hectares of land. On the gross annual income of farmers it shows that there is a big difference before and after the project implementation and most of the farmers have agricultural hand tools for their farms. Problems and possible intervention in farming were also identified, including problem of pests and diseases. Other problems identified in farming were the poor transportation network, inadequate tools and machinery, inadequate agricultural education and extension, unavailability of good quality of seeds, unpredictable climate and poor irrigation

facilities. The use of insecticides/pesticides, construction of new feeder roads, provision of subsidies to enable farmers purchase modern equipment and tools, free and affordable basic education, quality of a seed lot should be improved by conditioning, diversifying crop rotations, and irrigation scheduling were the possible intervention identified.

## **Conclusion**

Based from the results of the study, the following can be conclude; majority of the respondents were male from the age 61-70 have 3 to 5 children, most are married and have only finished high school. Houses were made of concrete and local materials, and most of them used firewood for cooking, electricity as a source of lighting, and source of water is from a deep well. Most of the farmers have 1.1 - 2 hectares of land. After the project implementation there was an increase of income and it can be attributed to the membership and participation of the respondents to the CBFM agroforestry project. Moreover, farmers adopted the practice of intercropping, increasing the rate of crop production. The problems identified were related on pest and diseases, poor transportation network, inadequate tools and machinery, inadequate agricultural education and extension, Unavailability of good quality of seeds, unpredictable climate and poor irrigation facilities.

## Recommendations

Based on the conclusions, the following are recommended:

1. The barangay and municipal LGUs could push for a road improvement program or project with the aid of the 2nd district administration. Farm-to-Market Road can increase local trade and productivity, reduce transportation costs of farm input and output, and minimize post-harvest losses.
2. Training Program on different livelihood opportunities can be coordinated with the DA, DENR and other relevant agencies, government or private in order to meet the cash needs as well as specific technical farming skills and knowledge needed by the forest-edge communities.

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## REFERENCES

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## APPENDICES

## APPENDICES



REPUBLIC OF THE PHILIPPINES  
**BOHOL ISLAND STATE UNIVERSITY- BILAR CAMPUS**

Forestry and Environmental Science Department  
 Zamora, Bilar, Bohol



**VISSION:** *A premier Science and Technology university for the formation of world class and virtuous human resource for the sustainable development in Bohol and the Country.*

**MISSION:** *BISU is committed to provide quality higher education in the arts and sciences, as well as in the professional and technologies fields; undertake research and development and extension services for the sustainable development of Bohol and the Country.*

### Survey Questionnaire

*Disclosure: All personal information collected will be used for the sole purpose of the study. Only the researcher has access to the data and will not be divulged to any third-party.*

#### I. Personal Information

Name of Respondent: \_\_\_\_\_

Age : \_\_\_\_\_ Gender: \_\_\_\_\_

**INSTRUCTION:** Please select and check (✓) your answer on the blanks provided for, as accurately and truthfully as possible.

#### A. Highest Educational Attainment

\_\_\_\_\_ No Formal Education      \_\_\_\_\_ Elementary      \_\_\_\_\_ High School

\_\_\_\_\_ College      \_\_\_\_\_ Vocational/Technical      \_\_\_\_\_ Postgraduate

#### B. Civil Status

\_\_\_\_\_ Single      \_\_\_\_\_ Married      \_\_\_\_\_ Widow

\_\_\_\_\_ Separated      \_\_\_\_\_ Live In

## C. Primary Occupation

\_\_\_\_\_ Farming \_\_\_\_\_ Hired labor \_\_\_\_\_ Public employee Other: \_\_\_\_\_

Number of children: \_\_\_\_\_

Total Amount of Salary \_\_\_\_\_

## D. Social Impact

## Household Composition

Total household size \_\_\_\_\_  
 Number of children in school \_\_\_\_\_  
 Type of housing \_\_\_\_\_  
 Housing materials \_\_\_\_\_  
 Source of cooking fuel \_\_\_\_\_  
 Source of lighting system \_\_\_\_\_  
 Source of water supply \_\_\_\_\_

## Farm Description

## II. Farm size and percentage of farm area allocated for specific farm use

INSTRUCTION: Please select and check (✓) your answer on the box provided for, as accurately and truthfully as possible.

| Indicators                          | Before Agroforestry Project Implemented | After Agroforestry Project Implemented |
|-------------------------------------|---|--|
| Area (ha)                           |   |  |
| % of Farm lot considered productive |   |  |
| <b>Fruit Trees</b>                  |   |  |
| Papaya                              |   |  |
| Mango                               |   |  |
| Durian                              |   |  |
| Avocado                             |   |  |
| Coconut                             |   |  |

|  |  |  |
|--|--|--|
| Pomelo/                                    |  |  |
| Rambotan                                   |  |  |
| Jack                                       |  |  |
| Bananas                                    |  |  |
| Guava                                      |  |  |
| Sugar apple                                |  |  |
| Tamarind/ Sambag                           |  |  |
| Cashew/ kasoy                              |  |  |
| Others please specify                      |  |  |
| <b>Agricultural Crops</b>                  |  |  |
| Rice                                       |  |  |
| Maize                                      |  |  |
| Sweetpotato                                |  |  |
| Pineapple                                  |  |  |
| Bananas                                    |  |  |
| Eggplants                                  |  |  |
| Long beans                                 |  |  |
| Ginger                                     |  |  |
| Bottle gourd                               |  |  |
| Squash                                     |  |  |
| Onion                                      |  |  |
| Yam bean                                   |  |  |
| Winged beans                               |  |  |
| Peanut                                     |  |  |
| Hyacinth beans                             |  |  |
| Mung beans                                 |  |  |
| Cucumber                                   |  |  |
| Mushroom                                   |  |  |
| Others please specify                      |  |  |
| <b>Timber forest products</b>              |  |  |
| logs                                       |  |  |
| wood chips                                 |  |  |
| sawdust                                    |  |  |
| wood                                       |  |  |
| Others please specify                      |  |  |
| <b>Non-timber forest product resources</b> |  |  |
| Herbs                                      |  |  |
| Fuel Wood                                  |  |  |
| Honey                                      |  |  |
| Mushroom                                   |  |  |
| Bush meet/wild animal                      |  |  |
| Bamboo                                     |  |  |
| Others please specify                      |  |  |

| <b>Pastured Animals</b> |  |  |
|-------------------------|--|--|
| goat                    |  |  |
| horse                   |  |  |
| pig                     |  |  |
| chicken                 |  |  |
| duck                    |  |  |
| Tilapia                 |  |  |
| cow                     |  |  |
| Carabao                 |  |  |
| Rabbit                  |  |  |
| Peacock                 |  |  |
| Ostriches               |  |  |
| Others please specify   |  |  |

**III. Gross annual income of farmers before and after agroforestry is implemented**

| Indicators                 | Before |      |      | After |      |      |      |      |      |
|----------------------------|--------|------|------|-------|------|------|------|------|------|
|                            | 2012   | 2013 | 2014 | 2015  | 2016 | 2017 | 2018 | 2019 | 2020 |
| Fruit Trees                |        |      |      |       |      |      |      |      |      |
| Agriculture Crops          |        |      |      |       |      |      |      |      |      |
| Timber Forest Products     |        |      |      |       |      |      |      |      |      |
| Non-Timber Forest Products |        |      |      |       |      |      |      |      |      |
| Pastured Animals           |        |      |      |       |      |      |      |      |      |
| Total                      |        |      |      |       |      |      |      |      |      |

**IV. List of machineries invested using agroforestry income.**

INSTRUCTION: Please select and check (✓) your answer on the box provided for, as accurately and truthfully as possible.

| Indicators                      | Please select and check (✓) |
|---------------------------------|-----------------------------|
| Hand Tractors/Power Tiller      |                             |
| Disc Ploughs                    |                             |
| Agricultural Hand Tools         |                             |
| Floating/Turtle Tiller          |                             |
| Hand Held and Knapsack Sprayers |                             |
| Power Threshers                 |                             |
| Water Pumps                     |                             |
| Motorcycle                      |                             |
| Others please specify           |                             |

V. What are the problems encountered in farming?

a. What are the problems met with regards to the planted trees, crops, etc? Please check the box.

|                         |   |  |
|-------------------------|---|--|
| 1.                      | Unavailability of good quality of Seeds         |  |
| 2.                      | Inadequate tools and machinery                  |  |
| 3.                      | Poor irrigation facilities                      |  |
| 4.                      | Small and Fragmented Holdings of land           |  |
| 5.                      | Lack of Storage facilities                      |  |
| 6.                      | Poor transportation network                     |  |
| 7.                      | Inadequate finance or credit facilities         |  |
| 8.                      | Inadequate storage and processing facilities    |  |
| 9.                      | Inadequate Agricultural Education and Extension |  |
| 10.                     | Problem of Pests and Diseases                   |  |
| 11.                     | Unpredictable Climate                           |  |
| 12.                     | Rural-Urban Migration                           |  |
| Others, please specify: |   |  |

b. What are the possible actions must be done? Please check the box

|                         |   |  |
|-------------------------|---|--|
| 1.                      | The quality of a seed lot should be improved by conditioning  |  |
| 2.                      | Provision of subsidies to enable farmers purchase modern equipment and tools.                                       |  |
| 3.                      | Ensure well-functioning irrigation systems and an efficient transport infrastructure.                               |  |
| 4.                      | Government must step in to educate, coordinate with the farmers, and find a way out from unproductive landholdings. |  |
| 5.                      | Construction of new feeder roads to open up the rural areas.  |  |
| 6.                      | Collateral security should be in form of guarantee rather than in material forms, like land and buildings.          |  |
| 7.                      | Provision of silos in the rural areas for storage of grains by government.  |  |
| 8.                      | Rural farmers should be trained on modern systems of farming.   |  |
| 9.                      | Insecticides and other chemicals used in the control of pests and diseases should be supplied at subsidized rates.  |  |
| 10.                     | Pests and diseases control units or departments should be established to control pests and diseases.                |  |
| 11.                     | Water conservation techniques such as mulching should be practiced.   |  |
| 12.                     | Provision of favorable prices for farm produce by the government.   |  |
| Others, please specify: |   |  |



Republic of the Philippines  
**BOHOL ISLAND STATE UNIVERSITY**  
College of Agriculture and Natural Resources  
Forestry and Environmental Science Department  
Bilar Campus, Zamora, Bilar, Bohol

November 11, 2021

**HON. DIOSDADO B. PEREZ**  
Barangay Chairman  
Magsaysay, Talibon Bohol

Dear Sir,

I am Miss Zuleika Sereno, a fourth-year college student at Bohol Island State University, Bilar Campus, taking up Bachelor of Science in Forestry.

One of the requirements for graduation is conducting research (thesis). My study is entitled "**SOCIO-ECONOMIC IMPACT OF AGROFORESTRY PROJECT TO FARMERS IN MAGSAYSAY, TALIBON BOHOL**". I am asking permission to conduct a study starting November, 2021 to January, 2022, every week days, 8 am to 5 pm in Pilar, Bohol.


The permission you will grant is a great help to my study with the assurance of complying whatever your office will require me.

Thank you and God bless!

Very truly yours,

  
**ZULEIKA A. SERENO**  
Student Researcher

Noted by:

  
**JAIRYL B. OCLARIT MSc.**  
Thesis Adviser

Recommending Approval:

  
**NOEL T. LOMOSBOG, PhD**  
Dean, CANR

Approved by:

  
**HON. DIOSDADO B. PEREZ**  
BARANGAY CHAIRMAN



Republic of the Philippines  
**BOHOL ISLAND STATE UNIVERSITY**  
College of Agriculture and Natural Resources  
Forestry and Environmental Science Department  
Bilar Campus, Zamora, Bilar, Bohol

November 11, 2021

**HON. JANETTE A. GARCIA**  
Municipal Mayor  
Talibon, Bohol

Dear Ma'am,

I am Miss Zuleika Sereno, a fourth-year college student at Bohol Island State University, Bilar Campus, taking up Bachelor of Science in Forestry.

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Thank you and God bless!

Very truly yours,

  
**ZULEIKA A. SERENO**  
Student Researcher

Noted by:

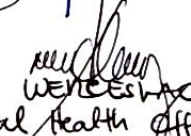
  
**JAIRYL B. OCLARIT MSc.**  
Thesis Adviser

Recommending Approval:

  
**NOEL T. LOMOSBOG, PhD**  
Dean, CANR

Approved by:

  
**HON. JANETTE A. GARCIA**  
Municipal Mayor

  
DR. NARLO WENCESLAO  
Municipal Health Officer

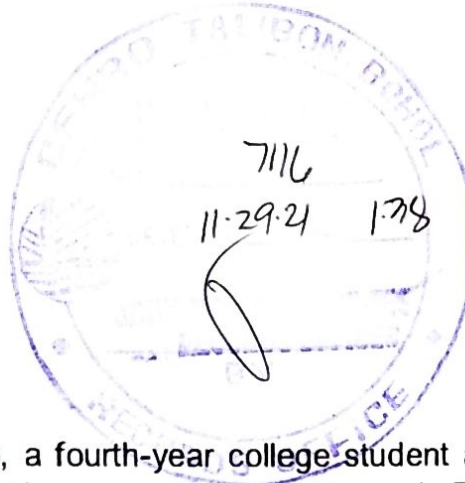
> no objection to conduct  
the research study



Republic of the Philippines  
**BOHOL ISLAND STATE UNIVERSITY**  
 College of Agriculture and Natural Resources  
 Forestry and Environmental Science Department  
 Bilar Campus, Zamora, Bilar, Bohol

November 16, 2021

**RICHARD N. ABELLA**  
 CENR Officer  
 San Jose, Talibon  
 Province of Bohol



Dear Sir,

I am Miss Zuleika Sereno, a fourth-year college student at Bohol Island State University, Bilar Campus, taking up Bachelor of Science in Forestry.

One of the requirements for graduation is conducting research (thesis). My study is entitled "**SOCIO-ECONOMIC IMPACT OF AGROFORESTRY PROJECT TO FARMERS IN MAGSAYSAY, TALIBON BOHOL**". I am asking permission to conduct a study starting November, 2021 to January, 2022, every week days, 8 am to 5 pm in Pilar, Bohol.

The permission you will grant is a great help to my study with the assurance of complying whatever your office will require me.

Thank you and God bless!

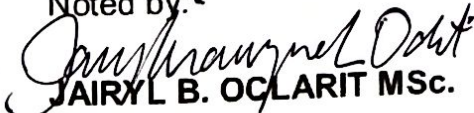
Very truly yours,

  
**ZULEIKA A. SERENO**  
 Student Researcher

Recommending Approval

  
**NOEL T. LOMOSBOG, PhD**  
 Dean, CANR

Noted by:-

  
**JAIRYL B. OCLARIT MSc.**  
 Thesis Adviser

Approved by:

  
**RICHARD N. ABELLA**  
 CENR Officer