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Terwilliger Center for Innovation in Shelter

An Overview of the Bamboo Industry in Cebu and Negros Oriental

JUNE 2025

Table of Contents


KAWAYAN
DESIGN STUDIO

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Introduction

Bamboo is a perennial giant grass and is sometimes considered as the tallest grass in the world.[1] It is extremely versatile, with a wide range of applications that include weaving and handicraft manufacturing and is also used as a construction material. Bamboo is often referred as the "poor man's timber," a common reference in South and Southeast Asia – including the Philippines – because of how affordable and widely available it is.

Bamboo has been a traditional construction material in the Philippines, popularly used to construct the *bahay kubo* (huts made of either bamboo or nipa) way back in precolonial and colonial times. As stated in the Hukay Journal for Archaeological Research in Asia and the Pacific, the vernacular architecture of the Philippines before the Spanish colonial period in the 16th century was greatly influenced by its environment. Throughout the archipelago, the local nipa hut or *bahay kubo* was the predominant residential structure. The construction materials used to build the nipa huts consisted of light materials and were oftentimes indigenous to the region such as bamboo, rattan, and cogon.[1]

In modern times in the Philippines, bamboo is not yet considered a mainstream construction material if one considers the trends among housing developers. Bamboo is not included in the list of the commonly used construction items in the Construction Materials Wholesale Price Index (CMWPI) monitored by the Philippine Statistics Authority. This list accounts for at least 100 construction materials.

In the provinces of Cebu and Negros Oriental, a variety of bamboo species thrive and have multiple uses. A common use is for furniture. As a traditional construction material, bamboo is used for *bahay kubo* or similar structures. Often these are untreated bamboo, which makes them susceptible to insect infestation that accelerates their decomposition.

In 2022, domestic sales of bamboo amounted to Php 143 million.[26] Innovations in technology have improved the quality of bamboo materials that can last for years. This makes bamboo a viable input especially for construction.

Habitat for Humanity's Terwilliger Center for Innovation in Shelter commissioned a study to profile the bamboo industry focused on bamboo production (propagating and planting), collection, and distribution in the provinces of Cebu and Negros Oriental. This is aligned to the effort of the Center to explore opportunities to leverage the growing bamboo industry in the region to promote quality bamboo solutions to improve the way low-income families build better and safer homes, improving their quality of life.

Methodology

To conduct this report, key informant interviews (KIIs) were facilitated with industry personalities, organizations, government agencies, bamboo processing entities, and designers in Cebu and Negros Oriental. Additionally, secondary data were accessed to corroborate the inputs from the KIIs.

Data gathered from the KIIs and secondary data review were analyzed to create a profile of the bamboo industry in Cebu and Negros Oriental.

Policies and Legislations

Since 1976, several policies have covered bamboo, which touched on the different aspects of the industry including production, harvesting, transport and marketing (Annex A). Policies on bamboo that were crafted as far back as 1976 intend to protect the population of bamboo species, especially those in natural forests. The national agency that has jurisdiction on all aspects of bamboo production and utilization is the Department of Environment and Natural Resources (DENR).[2]

Earlier policies delved into the cutting, harvesting, and transportation permits. These permits and the challenges to secure them were considered limiting factors to the industry. The recent development in a related policy simplified the requirement to just a single certificate of registration as a one-time requirement for all transactions pertaining to bamboo.[2]

The updated policy is Department Administrative Order (DAO) No. 2021-26 (Rules and Regulations Governing the Establishment, Harvesting and Transport of Bamboo). This policy was instrumental in shifting the requirements to transport bamboo which previously needed a Certification of Verification (COV) every time harvested bamboos were transported, which made the process tedious and expensive. In lieu of the COV, only a one-time registration was required, making transportation faster and less costly.

DAO 2021-26 was formulated to encourage the establishment of bamboo plantations and to promote the sustainable operations of bamboo-based industries in the Philippines. The Department Order supports the development of the Philippine bamboo industry through the increase in productivity, supply, and access to bamboo resources. It hopes to provide a system for sustainable harvesting, transport, and use of bamboo; and support the industry by strengthening areas such as research and development, processing, and marketing. The Department Order also targets to contribute to mitigating the impacts of climate change and attaining environmental stability.[3]

The policy encourages support to bamboo industry players that would include capacity building, technology transfer, processing and marketing, among others. In keeping with this direction, the Kawayan Collective Agriculture Cooperative, a supplier of treated bamboo in Negros Oriental, is the recipient of a PHP3 million grant from the Department of Science and Technology (DOST) that was earmarked to build an eco-dryer that will increase their production capacity. The grant also enabled a Bamboo Academy Learning Center that will provide training and capacity building on bamboo.

However, several key informants for this study stated that government support still needs to improve. Government agencies in the region that have interest in bamboo are also cognizant of the reality that they have limited knowledge and stock data. DENR Region 7 acknowledges that they still must refine their existing data on bamboo plantations, especially those under the National Greening Program (NGP).

DENR Region 7 sent a team to train with Kabilin Nature Farms and Bamboo Center, an agricultural cooperative managed by Cebu bamboo expert Vic Labao, to enhance their knowledge on bamboo. This was done in 2022, and it was only after the training that DENR aggressively went into bamboo industry monitoring.

Other government agencies in the region are still in the infancy stage in strengthening their capacities in bamboo. This goes for the regional centers of the Department of Trade and Industry (DTI) and the Department of Agriculture (DA), which have limited information on bamboo related matters.

The creation of the Cebu Bamboo Industry Development Council paves the way for the private and public sectors to come together to explore how to strengthen the bamboo industry. This group is still at a nascent stage but would play a critical role in developing the bamboo industry in Cebu.

Earlier policies on bamboo from 1970 to 2000 covered aspects on cutting, harvesting, and transport. Over time, policies evolved to cover the creation of plantations. The more recent DAO 2021-26 included guidelines for bamboo harvesting, transport, and establishment of plantations.

Bamboo is not yet a mainstream product in the construction industry in Cebu and Negros Oriental. The top construction materials used in the Philippines include wood, steel, concrete, brick, and roofing materials, but bamboo is not on the list.[4] Real estate developers across the different market segments do not commonly use bamboo, in favor of conventional materials such as concrete, hollow blocks, and steel. There are also no existing standards on bamboo as a construction input. Additionally, the Philippines' building codes do not have bamboo specific stipulations. Hence, most designers, builders and contractors would still push for conventional materials (e.g., steel vs. bamboo for scaffolding) in conformity to what is required by the building code and the local Office of Building Official (OBO).

There is a current campaign to incorporate bamboo into the National Structural Code of the Philippines (NSCP) as an alternative building technology.[5] The proponent of this campaign hopes to have this included into the 8th edition of the NSCP.

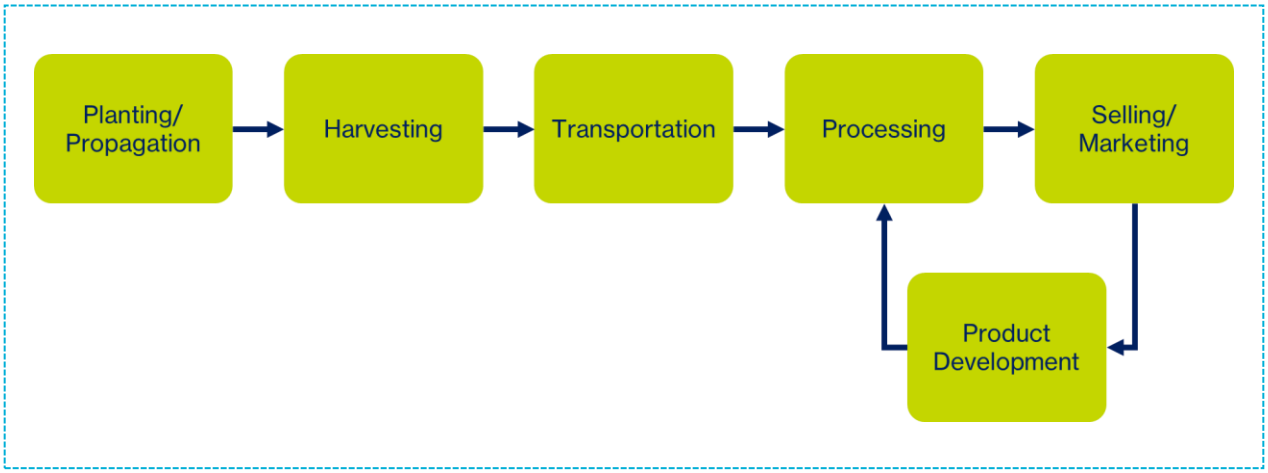
Currently, the Bureau of Philippine Standards of the Department of Trade and Industry (DTI-BPS) adopted two International Organization for Standardization (ISO) standards on bamboo structures as Philippine National Standards (PNS). The PNS ISO 19624:2020 specifies the grading procedures required to achieve the degree of reliability intended for the structural application of bamboo culms while PNS ISO 22157:2020 specifies the test procedures for specimens obtained from round bamboo culms, which are a single shoot of bamboo comprised of the entire unaltered cross-section of the bamboo. However, these have not been incorporated as part of the requirements of the Department of Human Settlement and Urban Development (DHSUD) or OBO to issue permits for bamboo-related construction.

National and local government support would encourage more individuals or entities to get into bamboo propagation. In Cebu, the municipalities of Tuburan and Balamban registered the biggest areas planted with bamboos by people's organizations. These two municipalities are also known for their strong support for bamboo propagation. In Tuburan, the mayor is a champion for incorporating bamboo into eco-tourism sites.

State of Bamboo Industry

While the bamboo industry in Cebu and Negros Oriental has been in existence for some time, it can still be considered a nascent industry.

Each stage in the industry value chain has room for better integration and improvement.



Current bamboo industry value chain in Cebu and Negros Oriental

Planting and Propagation

The species that is most commonly available in Cebu and Negros Oriental is Kawayan Tinik (*Bambusa blumeana*). This variety is used for construction and furniture manufacturing. Many furniture pieces are made from the base of Kawayan Tinik.

Giant bamboos, locally named Botong (*Dendrocalamous asper*), are used for posts or foundations. Another species that is widely distributed in Cebu is Bayog (*Dendrocolomus merrf llfanus*) which is also commonly used as a construction material.

Cebu. The province of Cebu does not have a reliable inventory of areas planted with bamboo. Currently, DENR has a list of hectares covered under the NGP (Annex B). This list is still undergoing refinement, which is not yet comprehensive and complete. People's organizations (POs) mostly operate the land planted with bamboos and monitored by DENR. DENR acknowledges that the survival rates are relatively low because they have limited knowledge on how to manage bamboo.[11] Thus, even if DENR staff are foresters, they still find value from the training done by experts like Vic Labao. Other POs that have experience with bamboo planting also share their knowledge. It is through these exchanges that they acquire more skills and knowledge in bamboo propagation.

Upon query with several Municipal and City Planning Development Offices in Cebu, many municipalities do not consciously monitor bamboo plantations.

Owners of bamboo clumps or plantation need to register their bamboo operations with the City Environment and Natural Resources Office (CENRO), especially if they want to transport the bamboo to another town or city.[11] Registration is, however, not necessary for those who transport bamboo to barangays within the same municipality or city or if the bamboo are intended for personal use.

DENR also has a list of companies or individuals in Cebu that registered their bamboo (Annex C). This registration will allow the transportation of bamboos from one municipality to another. However, the list is limited as the bamboos registered were mostly of the Kawayan Tinik variety. The Bamboo Forest in the municipality of Medellin also registered the greatest number of clumps from which many poles were transported to Bogo City for processing.

Per the DENR definition, plantations with 10 clumps of bamboo are already considered commercial operators and owners are required to register their bamboo operations.[11] Those with nine clumps or less are considered as backyard operators. The advantage of getting a registration is that this eliminates the need for a transport permit to bring bamboos to another place. Otherwise, those that transport without registration face apprehension and penalties.

Section 6 of DAO 2021-26 outlines the registration process. There are documentary requirements that must be submitted to either the city or provincial environment and natural resources office that will do a rapid site assessment and approve the application if all requirements are compliant. A one-time fee of PHP3,000 is required.

In the value chain, planting and propagation offer an opportunity by themselves. Prices for bamboo propagules start at PHP300 per piece, but the price depends on the variety to be planted. There are variants that can fetch as much as PHP800 per propagule and a rarer variety can cost PHP2,000 per propagule. Planters that propagate seedlings of different varieties stand to earn more substantially. The earning potential can still be higher if the general demand for bamboo poles will increase.[12]

There are landowners who choose to dedicate tracts of land to bamboo for a variety of reasons and not necessarily for commercial purposes. They opt to plant for the environmental value of bamboo. However, there are also others who plant with the intent of eventually earning from selling bamboo poles. The local government unit (LGU) of the municipality of Tuburan has planted bamboo groves mostly for eco-tourism purposes. The LGU has planted 12,000 propagules and has continued to plant annually.[12]

Based on DENR's data on plantations planted under its NGP in Cebu, the average survival rate is 40%. Between 2013 to 2021, they registered 2,273 hectares of bamboo planted across 24 cities and municipalities which are planted by different people's organizations.[14]

In estimating the potential number of clumps from the DENR data, a conservative 200 clumps per hectare is assumed. This would provide an estimate of 434,000 clumps for the entire province of Cebu. Using the average survival rate of 40%, there is an estimate of 173,000 surviving clumps of varying ages and maturity for harvesting and processing.

Negros Oriental. For the province of Negros Oriental, DENR listed 1,418 hectares of bamboo plantations with an average survival rate of 74%. A hectare can accommodate 400 clumps of bamboo, but for purposes of computation, the assumption per hectare is 200 clumps.

Using this assumption, Negros Oriental has an estimate of 209,864 surviving clumps spread across 20 municipalities and cities.

The most widely distributed species is Bayog (*Dendrocolomus merrf Ilfanus)*. Species considered to have high commercial value include Kawayan Tinik (*Bambusa Blumeana*), Botong (*Arundarbor bitung (Schult.f.) Kuntze*), and Giant Bamboo (*Dendrocalamus giganteus*).[14]

There is opportunity for backyard bamboo planting as an option. However, those who do not have enough financial capital but may want to venture into planting must consider dedicating their land to bamboo as it takes about five years before the clumps start providing income. To encourage marginal farmers, there is a need to educate them on how to intercrop so that they can still earn while waiting for their clumps to mature. Bamboos thrive with other plants so it is possible to do intercropping, which will allow the land to earn on the short-term while waiting for bamboos to grow old enough to be harvested and sold.

As the DENR key informant shared, while there is a general impression that there is a demand for bamboo, what is not often clear is where exactly the demand is coming from. He sees the need for stronger networking so that those who plant bamboos can be properly linked to those who will buy them.[11]

Harvesting

Harvesting bamboo is a separate process, and there are factors to consider in choosing the right poles to cut such as the age of the pole, its length and sturdiness, and how straight it is. These are important considerations especially for bamboos that will still be processed in the next stage. Bamboos that are not of proper age may end up being brittle and not of good enough quality to be processed. A supplier of bamboo huts and houses intimated that he goes to the site to check on the right poles to harvest. He also harvests the bamboos himself. This is to ensure that the right quality of poles will be brought to his manufacturing site. [12]

Cebu. In Cebu, manufacturers and processors typically have their own identified sources. One of the processors based in the municipality of Liloan has community-based sources. He personally goes to the sites to check if the bamboos are in the right age for harvest. He also harvests and transports them himself to secure the quality of the harvested bamboos.[15]

The owner of a laminated bamboo facility in Bogo City also relies on community-based sources. Some of these sources deliver the bamboo poles themselves. The owner has managed to negotiate with the Bamboo Forest in Medellin to also harvest from the plantation by educating its owner that it is good for bamboos to be harvested to allow new shoots to grow, especially that old bamboos would be rendered useless. The owner relented and allowed her to harvest from the bamboo clumps and this has become one of her reliable sources of bamboo. [16]

A bamboo retailer in Talisay City sources its Kawayan Tinik bamboos from the municipality of Dumanjug and Botong bamboos from the municipality of Balamban. It used to have suppliers from Naga City and San Fernando but they have stopped supplying due to DENR restrictions. The retailer gets the poles at PHP100 and they retail these at PHP190 (Tinik/6ft), PHP250 (Botong/8ft), and PHP250 (Bamboo for scaffolding/24ft).[17]

The location of the bamboo also has an impact on its cost. Bamboos that are harvested from mountainous and more hardly accessible areas imply higher added cost due to the challenge of bringing poles of bamboos down from higher areas. In Cebu, the Kabilin Nature Farms & Bamboo Center is a popular source of bamboo and is a by-word in the bamboo industry. To date, the Center holds 182 bamboo species.[18]

Negros Oriental. In Negros Oriental, the Kawayan Collective Agriculture Cooperative source their bamboos from community farms scouted by their supply lead. Prior to harvesting, they send checkers to validate and identify the bamboo poles for cutting, and a harvester will follow to do the actual cutting. This way, they are assured that the bamboos they will utilize will fit the quality they are looking for.[19] The cooperative's personnel have also undergone training to properly handle the checking and harvesting techniques. This is the same case for Zamboanguita-based Kawayan Village Resort, which continues to enhance the capacities of their personnel including those that harvest the bamboo.

The prices of poles would vary depending on variety and location. In Negros Oriental, giant bamboos are typically priced at PHP350 per pole. They usually grow in mountainous areas thus making it more challenging to harvest.

Transportation

Harvested bamboos need to be transported from where they are harvested to where they will be processed. In Cebu and Negros Oriental, the main challenge is having the bamboo farm registered to allow them to transport harvested poles to other municipalities. The registration from local environment and natural resources offices will suffice, which dispenses the need for a transportation permit. Otherwise, penalties will apply if entities are caught transporting bamboo without registration.

The price of the bamboo poles must include the cost of transporting them. Bamboos transported from far-flung and difficult to access areas will translate to higher transportation costs, increasing the cost of harvested pole. In Negros Oriental, for example, a PHP100 bamboo pole has allocated PHP20 for transportation. Bamboo growers that do not register their bamboos can only transport them within the boundaries of the LGU where they are located.

Processing

Bamboo processing may be in the form of laminated timber or engineered bamboo. Common to both procedures is the initial treatment of bamboo poles. Processing typically involves immersing the poles in chemical baths but this process requires substantial volume of chemicals, space, and financial investment to install the physical structures and drying facilities for the poles.

Product variation of treated bamboo may be in the form of the basic treated bamboo poles. Other product items may include bamboo slats, flattened bamboo, bamboo panels, and bamboo veneer sheets. Quality control is crucial in the processing stage because if not properly done, the bamboo may still be subject to disintegration. On the other hand, properly treated bamboo may last up to 50 years. The poles are soaked in a solution bath to rid it of starch. After drying, the poles are subjected to further processing depending on the variant or design specification.

Rizome Philippines is putting in PHP100 million to its plant in Cagayan de Oro. Its bamboo sources include agrarian reform recipients and communities from mining areas. Rizome Philippines hopes to be part of the US$70 billion global bamboo industry largely dominated by China. According to former Agriculture Secretary Luis Lorenzo, Jr., who is also an investor of Rizome Philippines, there is a need for bamboo to be a recognized construction material in the implementation of the Building Code. Additionally, he indicated that engineered bamboo is a proven technology that is as strong as steel, tough as concrete, and beautiful as hardwood aside from being fire resistant, water resistant, and pest free. [22]

At present, Rizome Philippines produces panels, boards, veneers, and woven strands made of giant asper bamboo. It produces and exports manufactured bamboo to America, Europe, Middle East, Africa, and Asia-Pacific.[22]

On the other hand, a member of the Philippine senate is pushing for the development of the bamboo industry which he foresees can contribute US$3.5 billion to the economy. He cited that while research and development programs are being carried out by the departments of science and technology, trade, environment, and agriculture in an attempt to address the insufficiency of information and data resources, these initiatives are still fragmented. This is further worsened by the perception of the private sector for a lack of a functional governmental body overseeing the development of the industry, which hinders its optimization. [23]

In Cebu and Negros Oriental, the quantity of treated bamboo that are processed and produced are currently enough to satisfy the volume needed for the various projects of those who process them. The facilities in Bogo City and Liloan process the bamboo to satisfy their requirements to manufacture their furniture pieces and bamboo huts. The harvested products of the Toledo cooperative are also earmarked for the different companies that support them.

Cebu. There is a processing facility in Bogo City that produces furniture and bamboo huts for export and has constructed houses made of bamboo. In Liloan, 2ny, whose main products are bamboo huts, also processes bamboo. Aside from its main products, 2ny also has clients who commissioned them to build houses.

The Kabilin Nature Farms & Bamboo Center also has its own processing facility. It also runs trainings in its farm for those who are interested to explore getting into engineered bamboo.

In Toledo City, the Toledo United Farmers, Fishermen, and Women Workers (TUFFWOW), a local cooperative, has its processing facility but their products are currently utilized by the Aboitiz Group, which is the cooperative's corporate sponsor. In the long run, TUFFWOW envisions to produce more engineered bamboos which they hope to sell to a bigger market.

Negros Oriental. The Kawayan Collective Agriculture Cooperative has a bamboo processing facility and supplies most of the processed bamboo requirements in Negros Oriental. A grant from DOST has enabled the cooperative to improve their production capacity.

Meanwhile, the Kawayan Village Resort has also put up its own bamboo processing facility in collaboration with Handy Manoy, a home renovation and construction services provider. They envision the resort to also be a showcase of bamboo products.

Marketing and Selling

In 2022, domestic sales of bamboo were registered at PHP143 million. The most common product for export is furniture and the export market includes the countries of USA, Japan, UK, Germany, and France.[24]

However, locally processed bamboo products have limited exposure in the mainstream market of Cebu and Negros Oriental. Mainstream exposure refers to conventional marketing wherein products are offered to buyers who are aware that these products have reasonable practical use and have prices they are willing to pay. This translates to widespread exposure to facilitate brand and product awareness that would help buyers make a calculated decision if a product is worth its price versus what the competition offers. This would mean visibility and presence in physical distribution outlets and multi-media channels, and at a particular level, being a byword in the construction industry.

The local treated bamboo industry in the region has not yet reached this stage. Part of this is because most of the products are earmarked for pre-orders utilized by ongoing projects of the manufacturers. Hence, there is limited stock of what can be sold to the general market. There is a dearth of bamboo-specific data on the market or demand side. DTI was able to outline these potential products, but more studies are still needed to quantify the demand volume for these products. This echoes the sentiment from the member of the Philippine senate who cited the fragmented initiatives of the country's research and development programs from the departments of science and technology, trade, environment, and agriculture to address the insufficiency of information and data resources on bamboo.[23]

Production is not yet sufficient for bamboo products to be distributed and displayed in different retail outlets. Other than word of mouth, there has not been any substantive and consistent marketing campaigns to push for bamboo-based products in Cebu and Negros Oriental. There is a regular bamboo festival organized in Cebu that showcases specialty bamboo products and innovation. This is an avenue of exposure for the bamboo industry.

Bamboo is associated with personalities or organizations that have built a reputation around bamboo such as the Kawayan Collective Agricultural Cooperative in Negros Oriental and Vic Labao of Kabilin Nature Farms & Bamboo Center in Cebu. They are also the recognized sources of treated bamboo and other bamboo-related products. Bamboo has several characteristics that qualify it as a sustainable material. Some of these attributes are not widely known and can be potential selling points when marketing bamboo products. These attributes can help neutralize the common notion that bamboo is the "poor man's timber" and is of inferior quality.

Some of these attributes are as follows:

1. ***Renewable material.*** Bamboo grows three times faster than other species.[6] It can keep on growing and poles may be harvested occasionally without uprooting the whole clump. This value of bamboo being a renewable source is often not disseminated. However, if this is highlighted, it can help shift the common perspective of bamboo as an ordinary material and underscore its regenerative characteristic. A bamboo clump need not be uprooted to harvest the poles unlike other timber products wherein whole trees are cut to produce timber.

2. ***Low Environmental Impact.*** Bamboo extraction has lower environmental impact compared to other materials like timber. Bamboos thrive with less intervention and require lesser volume of water, minimal fertilizer, and no pesticide to survive. They have high carbon sequestration potential and are an effective protection against soil erosion. Structures made of bamboo are also cooler compared to conventional concrete structures.

   This can encourage reduction of energy use. Bamboo experts and enthusiasts are familiar with the low environmental impact potential of bamboos. This detail is not often mentioned with bamboo products that are offered in the market. This information can be maximized when marketing bamboo products. This can enhance the image of bamboo materials and consequently highlight the value of bamboo products once they are sold in the market.

3. ***Versatility.*** Bamboo has a wide range of applications in construction. They can be incorporated into structural elements and can also be processed into flooring, roofing or wall panels. They can replace traditional materials such as wood, steel, and concrete that are often made of non-renewable materials.

   The versatility of bamboo is still not widely known in Cebu and Negros Oriental. There is currently a lack of standards that will support the integrity of the bamboo as a construction implement, which limits its widespread and mainstream adoption. Currently, there are no bamboo specific standards with OBO in any of the provinces or with DHSUD.

4. ***Strength and Durability.*** Some bamboo species are suitable for structural purposes because they have tensile strength comparable to that of steel. In some countries, bamboo can support a building up to four stories high.[8] If properly treated, bamboo's resistance to pests and decay can assure its longevity.

   At present, bamboo does not compare to steel, which is made of non-renewable materials, in terms of acceptability and reputation. There is also the challenge that if bamboo gets adopted as a mainstream construction material, there is no reliable source that will allow the consistent volume and availability of bamboo raw materials.[9]

5. ***Energy Efficiency.*** Processing and converting bamboo into construction materials require less energy compared to the production of traditional building materials like steel or concrete. However, bamboo as a construction input is not yet part of the conventional perspective of construction methodologies. They are advocated by artisans, enthusiasts, and specialty experts but are still not widely accepted by general industry practitioners.

6. ***Carbon Sequestration.*** Some studies show that bamboo can sequester an average of 17 tons of carbon dioxide per hectare per year.[10] A full grown bamboo is estimated to sequester 400 kilograms (0.45 tons) of CO2 annually.[6] Bamboo also continues to store CO2 even if it is used in construction. This attribute can be a strong marketing message when pushing for bamboo in the market.

   It can add to the overall value of the bamboo and consequently afford price flexibility once the bamboo materials are offered to the market. The sequestration value from bamboo clumps can potentially be traded in the carbon trading platform.

7. ***Support Local.*** Bamboo is locally available in the Philippines. It is a renewable material that can easily be propagated, harvested and processed locally. This can enhance the environmental impact message of bamboo products because shorter transportation from source to processing plant reduces the need for transportation over long distances.

8. ***Affordability.*** Over time if bamboo products achieve widespread availability, it is possible to make it more affordable in price. Its fast growth and ease of cultivation also contribute to its cost effectiveness. Now, cost of engineered or processed bamboo may be high compared to conventional, mass-produced materials. The price of the final product of processed bamboo may still be high for the incremental build market.

Product Development

Product development of bamboo has evolved from the traditional such as *amakan* (woven bamboo walling) and *lipak* (bamboo slats) which are often untreated. Artisans, enthusiasts, and specialized designers have ventured to innovate in utilizing bamboo for construction, but these are not yet mainstream designs. These are not yet widely patronized by the public. Those who venture to adopt bamboo materials are those who have acquired a level of education on the value of bamboo and appreciate the attributes of bamboo.

Bamboo furniture, crafts, and accessories are the items most commonly produced. In the 2021 Central Visayas Economic Factbook, bamboo was only mentioned as a product for furniture of other materials including cane, osier, or similar materials with a collective estimated value of US$1.9 million.

Cebu. Bamboo products in Cebu range from furniture to bamboo huts. Structures have been constructed such as homes and resort facilities. A manufacturer of bamboo furniture and bamboo huts is into export. The bamboo huts are disassembled and assembled in its destination. Bamboo houses or structures are built for individual owners. Some opt for bamboo for its resort feel. Others prefer bamboo because of its cooling effect.

There are those who also advocate for an indigenous feel thus preferring to use locally sourced materials. Artisan structures have been constructed using bamboo materials with applications ranging from aesthetic to full scale structural and innovative designs.

Negros Oriental. In Negros Oriental, the Kawayan Collective Agriculture Collective has product options for construction materials that include graded poles, prefab wall panels, trusses, furniture, and engineered panels. The cooperative, in collaboration with the Terwilliger Center, also developed starter kit homes.[19] They also sell treated poles that are bought by builders who use them for renovating or building bamboo houses.

The Kawayan Design Studio built the Pavilion, an events venue in Dumaguete City. Additionally, Kawayan Village Resort is currently under construction in partnership with Handy Manoy, using products from its own processing facility.[20]

Foundation University in Dumaguete City also put up the Estudio Damgo project where architecture students can work on their own bamboo designs, create prototypes, and source out funding to execute their projects.[21]

Bamboo Products and Potential Market

The Department of Trade and Industry provided a list of bamboo products and their potential market but noted the need to do more research and studies on this topic.

Product	Market	Remarks
Construction materials, engineered bamboo (laminated composites) Furniture & furnishings (high end)	Construction industry	There is a need to advocate for the amendment of the Structural Code of the Philippines to incorporate bamboo as a structural material
Handicrafts (fashion accessories, baskets, kitchen utensils, toys, etc.)	Domestic market export	Various bamboo handicrafts are produced in the four provinces of Region 7
Bamboo shoots, bamboo-based drinks, food products	Domestic (households, food processors), export	More information on market for processed bamboo food products needed
Bamboo propagules (commercial grade species)	Government (DRRM), landscapers and developers, riparian project implementors	For protection from disasters, for riverbank rehabilitation
Bamboo cottages	Domestic (direct consumers, resorts, government for community structures), export	Produced in the four provinces of Region 7
Bamboo fiber (for clothing, composite technology)	Domestic (i.e., weavers)	Further R&D needed on the composite technology, more information on the market
Fuel (bamboo charcoal, bamboo pellets, activated carbon)	Domestic (agriculture, direct consumers, industrial buyers), export	More market information needed
Bicycles, boats, transportation	Domestic (direct consumers), exports	There are producers in Cebu and Negros Oriental

Wall cladding (*amakan*)	Domestic (direct consumers)	Wall cladding produced in all provinces of Region 7, with consumers also within the
Bamboo forest (tourism destination), bamboo park, camps	Tourism sector, education sector	Presence of parks and camps in all provinces of Region 7

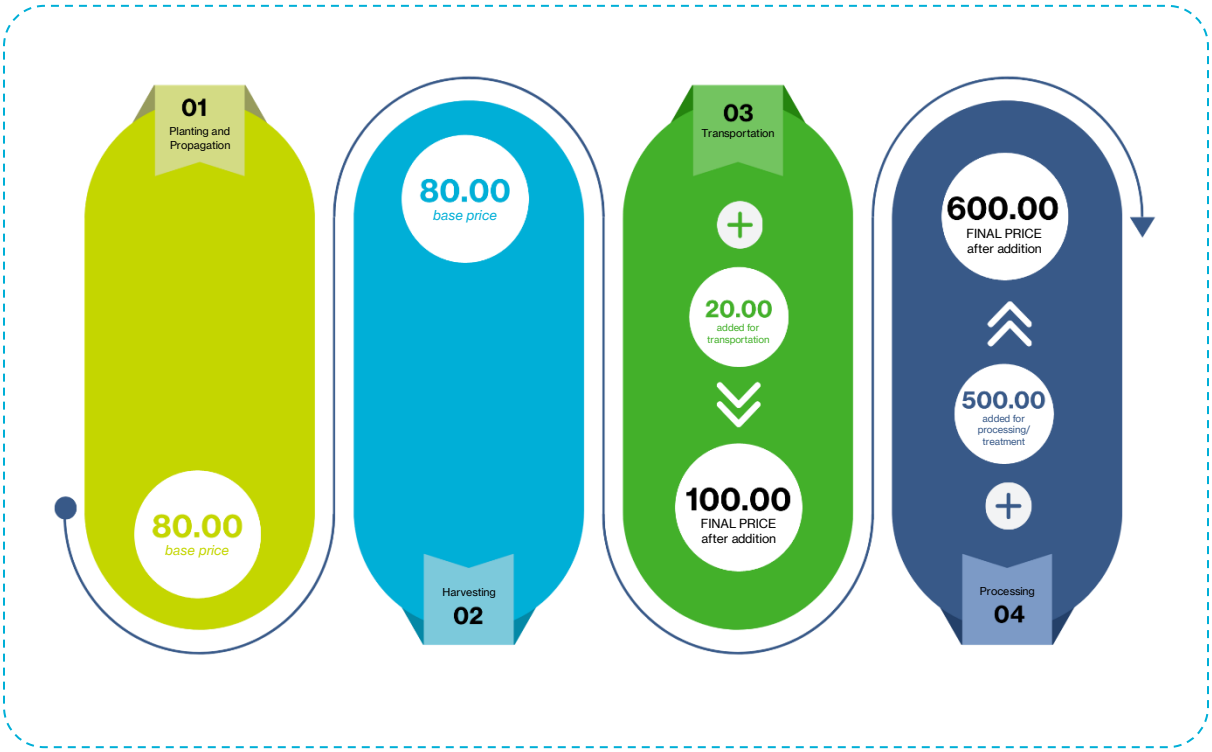
Key Considerations of Bamboo Products for the Owner-Driven Construction Market

One of the potential opportunities for bamboo is the production of quality construction materials that can be used by the owner-driven construction segment. This is a housing segment in the Philippines characterized by (1) security of land tenure; (2) daily income ranging from US$ 5 to 15 or a maximum annual income of PHP90,000 to PHP270,000, based on the prevailing exchange rate of Php 50:US$ 1 (according to Philippine Statistics Authority and World Bank data); (3) ownership of a residence which may start as a “temporary” housing unit but which they are willing to invest in and upgrade; and (4) usual locations in rural or peri-urban areas.

There are key factors, however, to consider in promoting bamboo products for this segment.

Affordability. There are layers to the cost of bamboo materials. At the onset, the initial cost may include labor for harvest and handling. Transportation cost is another layer and this depends on where the poles are coming from. There may also be variation in price depending on the bamboo species. The typical base price of bamboo in Cebu or Negros Oriental is Php 100 per pole for untreated bamboo, where Php 20 covers the transportation cost while the remaining Php 80 is shared between the harvester and bamboo owner.

Another layer of cost is applied once the bamboos are treated, which will vary depending on the process and chemicals used as treating and processing require special skills. Treated 6-meter poles sell for Php 600.



Installation of bamboo requires another set of skills especially when dealing with joints, adding another layer to the overall cost. The starter home kit of the Kawayan Collective Agriculture Cooperative, which was developed in partnership with Habitat's Terwilliger Center, costs PHP10,000 per square meter, which is slightly lower than the PHP11,300 per square meter average for socialized housing projects.[19] A bamboo house builder in Liloan can build a house at PHP11,500 per square meter, excluding the toilet which has to be made of concrete.

For the owner-driven construction market, materials like *amakan* or *lipak* may be considered affordable. However, these are often untreated resulting in higher costs in the long run. The price of treated bamboo materials may be on the high side which will be a limitation for this market. It is possible, however, to lower the price range of processed bamboo by economies of scale.

Availability. Locally engineered or laminated bamboo are not yet available in commercial quantities in Cebu or Negros Oriental. Those who produce engineered or laminated bamboo already earmark their production for existing and pre-identified projects. Typically, production happens if there are orders in place. Bamboo produced by TUFFWOW in Toledo City is currently allocated for the Aboitiz Group as the organization's main buyers.[25] Kabilin Nature Farms & Bamboo Center mainly provides bamboo for Therma Visayas, Inc. and is currently looking into options to improve its engineered bamboo business. The production in 2ny from Liloan is also earmarked for the houses it is building, which include bamboo huts, while Bamboo Grove's production is intended for their furniture or bamboo hut production.

In Negros Oriental, Kawayan Collective Agriculture Cooperative produces treated bamboo for their projects and other buyers. For the ODC segment, locally sourced bamboo products are not yet commercially available. DOST's support to the Cooperative, however, will allow them to increase the production of treated bamboo and train more people in the industry.

For the owner-driven construction market, locally sourced bamboo products are not yet commercially available.

Accessibility. Even if locally produced treated bamboo and other bamboo products will become more available, there is still the consideration on where the ODC market can easily access and purchase them. Since bamboo is still not considered a mainstream material, more channels are needed to enable mass information on the advantages and value of buying and using bamboo materials. Another concern is the limited number of workers with specialized skill sets who can assist this market in the installation of the materials.

The Terwilliger Center for Innovation in Shelter, a unit of Habitat for Humanity International, provides support to private sector firms and other influential actors in the market to improve their ability to develop, market and distribute housing-related products and services which meet the needs of low-income families.

In the Philippines, the Terwilliger Center works with financial institutions, manufacturers and retailers, academic and vocational institutions, public sector agencies, civil society organizations, contractors and designers, and media companies---piloting new approaches and making a business case where none exists. Through these partnerships, the Center identifies disruptive technologies, develops innovative models and works to move new solutions for low-income consumers to access, adopt, and use.

Conclusion: Opportunities and Insights for the Bamboo Industry

While the bamboo sector demonstrates immense potential for growth and marketability in Cebu and Negros Oriental, the different sections in the value chain are currently in silos and there is a need to strengthen integration to support the growth of the industry.

For example, those that harvest or process bamboo should know where the bamboo plantations are located. Planters have varied motivations to plant. Planters must also know who are the entities that purchase or process bamboo so they can easily connect once they have ample stock of poles for harvesting.

Consolidated information on planted areas is limited to what DENR can provide which is based on its NGP data but they also admit that the list needs more validation on the ground. Private planters are required to register their plantations to give them license to transport harvested poles. However, not all planters have registered and there is no intensive campaign to do an inventory of these areas.

For Cebu, there are private individuals or entities who have planted on their properties but there is no consolidated directory on them yet. In Negros Oriental, Kawayan Collective developed its own directory of technical experts and suppliers.

There is an opportunity to campaign for bamboo plantations in more areas, by educating landowners on the value, advantages, and benefits of planting and earnings from bamboo.

Planters have varied motivations to plant and are not cohesively linked to processed bamboo market players such that their production will be earmarked to support a given demand. Some planters may need more education on the proper harvesting process to make sure that the harvested bamboo fits the requirements for processed bamboo production.

The creation of linkages between growers and bamboo processing facilities is also needed to ensure sustainable supply of raw materials and a stable market for harvested bamboos. There is also a need to campaign for more bamboo suppliers to register their clumps to expand the areas where the bamboo may be delivered. This will also allow bamboo processors to know where to source their bamboos in proximity to their location.

The bamboo industry is an industry that needs specialized skill sets for planting, harvesting and handling, processing, assembling, and marketing their bamboo products to increase demand for them. These open opportunities to educate more people on the different aspects of the bamboo industry value chain allowing for more employment and income earning opportunities.

There is still room to improve on product development and marketing. The existing products in Cebu and Negros Oriental are still used on a per order basis and are not yet widely marketed. Products are limited because demand is not yet stable, while demand is not increasing because production of different product lines is still limited.

These dual challenges can be addressed by strengthening product development based on market needs and exploring where these products will be distributed and be accessed by the market.

Streamlining bamboo processing operations can enable sustainable production. Additionally, there is an opportunity to facilitate market studies to determine potential demand for the different bamboo construction materials based on the 4Ps of marketing – Product, Price, Place and Promotion.

The NGP has existing plantations in Cebu and Negros Oriental which are not registered with the DENR for harvesting and transport. Potentially, these can become additional sources of bamboo poles which will give the POs that are managing them a revenue stream.

Agencies like DENR and DA will be instrumental in expanding the number of bamboo plantations and dissemination of propagules in the region. Housing developers have socialized housing requirements, and there is an opportunity to market prototypes of bamboo houses that they can utilize for this.

A competitive profiling of treated bamboo materials versus conventional construction materials in terms of price and availability can serve as a gauge to calibrate the processes and product parameters of bamboo production. An overall profiling of the bamboo market will help determine the actors from the supply and demand sides and the market's size and value.

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Annexes

Annex A. Existing Policies and Proposed Bills Related to Bamboo[2]

Year Issued	Policy/Bill	Highlight/Salient Features
Existing Policies		
2021	DENR Administrative Order No. 2021-26 Rules and Regulations Governing the Establishment, Harvesting and Transport of Bamboo.	This Order aims to encourage the establishment of bamboo plantations and to promote the sustainable use of bamboo as wood substitute in support of the development of bamboo-based industries in the Philippines. This Order shall cover all naturally grown bamboo stands, backyard farms and plantations found within forest lands, agricultural lands (alienable and disposable), mineral lands, private titled lands, and ancestral lands.
2016	Special Order 2016-639	Designating ERDB as the overall coordinator in the implementation of bamboo plantation development and mangrove rehabilitation nationwide.
2016	DAO No. 7 – DENR Manual of Authorities on Technical Matters	Adopted to delegate authorities and delineate functions in the Central and Field Offices Transport of Non-timber forest products such as bamboo coming from private lands: Limits of Authority – Certification Approving Authority – CENRO
2015	EO No. 193 – Expanding the coverage of the National Greening Program (eNGP)	In support of this policy, the DENR launched Bamboo Plantation Development Project (BPDP) that targets to establish 256,995.90 ha from 2017– 2022. For the past thirteen years, 62,230 ha of bamboo plantation were established through the NGP and the eNGP.
2011	DAO No. 11 – Guidelines and Procedures in the Implementation of the NGP	Section 2.2.1 Production of planting materials including bamboo in nurseries and other appropriate sites.

Year Issued	Policy/Bill	Highlight/Salient Features
2011	Executive Order No. 26 – National Greening Program	The DENR was able to establish 16,442 ha of bamboo plantations in 15 regions from 2011–2015.
2011	DMC No. 30 – Directing full implementation of the Philippine Bamboo Industry Development (PBID) Program issued by the Office of the President	Harmonizing PBID and NGP programs.
2004	EO No. 318 – Promoting Sustainable Forest Management in the Philippines	Encourages the establishment of non-timber forest products including bamboo in public and private lands. It also promotes the enhancement of economic and political benefits and attainment of self-sufficiency in the country's wood requirements.
2000	DAO No. 63 – New Rates of Forest Charges Pursuant to Republic Act No. 7161 (R.A. No. 7161) and Based on the 1999 FOB Market Price of Forest Products	Applicable to bamboos on public lands/forests. The high current rates of forest charges may deter farmers from collecting bamboo such as *Kawayan tinik/Kawayan kiling, bayog, boho/bulo* other species of erect bamboos from the forest, as the payment will eat up 30% of the farm gate value they can receive from each pole.
1999	DAO No. 20 – Supplemental Guidelines Governing the Registration, Harvesting, Transport, and Marketing of Timber By-Products Coming from Private Plantations Within Private Lands or Tax Declared Alienable or Disposable Lands	States that the private tree or bamboo plantation owner need not request for a cutting permit for a registered plantation of non-premium species.
1997	DAO No. 4 – Rules and Regulations Governing the Industrial Forest Management Program	Invests IFMA plantations owners with the "right" to export forest products from the plantation, but in accordance with the government allocation system.

Year Issued	Policy/Bill	Highlight/Salient Features
		Said “right” of IFMA holders to harvest, sell and utilize the trees and crops that they themselves established, in whatever marketable form(s) was categorically affirmed by DAO 1999-53.
1996	DAO No.26 – Revised Guidelines Governing the Harvest and Transport of Planted Trees and Non-Timber Products within Social Forestry Areas	In Social Forestry areas, a 100% inventory of planted bamboo is required before harvesting and is allowed for a maximum period not to exceed six months, subject to availability of poles to be harvested.
1994	DAO No. 7 – Revised Guidelines Governing the Issuance of Certificate of Origin of Logs, Timber, Lumber and Non-Timber Forest Products	Requires Certificate of Origin for public lands/forest lands and CoV for private lands for harvesting and transporting bamboo.
1970	Forestry Administrative Order No. 11 – Revised Forestry License Regulations	Cutting permits should be secured prior to collection and harvesting.
Proposed Bills		
2018	Senate Bill No. 1478 – Institutionalizing Bamboo Industry Development in the Philippines through the creation of Bamboo Industry Research and Development Center (BIRDC)	This bill is a substitute bill for SB 652, 665 and 716 earlier filed in the 17th Congress, basically consolidating bills authored by Senators Aquino IV, Legarda, Villar, and Zubiri.
2018	House Bill No. 904 – An Act Institutionalizing a Philippine Bamboo Industry Development Program	Authored by Hon. Deogracias Victor B. Savellano to promote the Philippine bamboo industry by providing a development program and to discover and evolve technologies.
2018	House Bill No. 6783 – An Act Institutionalizing Bamboo Industry Development in the Philippines, Creating the	Authored by Luis Rey F. Villafuerte, Jr. The bill shall support indigenous, scientific, and technological capacities and skills in sustainable utilization,

Year Issued	Policy/Bill	Highlight/Salient Features
	Bamboo Industry Research and Development Center (BIRDC), Appropriating Funds Therefore and for other Purposes	propagation and promotion of bamboo as furniture, food, construction, and design materials and other uses.
2017	House Bill No. 6625 (formerly HB 4577) – An Act to Classify Bamboos as Unregulated Forest Product and for other Purposes	Authored by Hon. Deogracias Victor B. Savellano. This Act will promote the development of the Philippine bamboo industry by streamlining policies that constrain its growth, encourage investors to invest in the establishment of plantations and processing facilities, and provide sustainable livelihood to communities in rural area.
2017	House Bill No. 4812 – An Act Institutionalizing the Bamboo Development Program and Providing Funds Therefor and for other Purposes	Authored by Hon. Emmeline Y. Aglipay Villar. The Philippine Bamboo Industry Development Council aims to make the Philippine Bamboo Industry competitive in the local and international markets while providing employments and providing opportunities for rural based, micro, small, and medium community enterprises to flourish.

Annex B. Bamboo Plantations Managed by POs under the National Greening Program in Cebu and Negros Oriental

Municipality/City	Organization	Number of Hectares	Total
Province of Cebu			
Alegria	COMFA	123.98	188.99
	GUFA	55.01	
	VIFA	10	
Argao	CBFTFTPAI	64.43	104.43
	SALMUT	40	
Badian	BFDA	60	60
Balamban	BUKID MPC	314.07	374.6
	Carmelita Bacalso	10.54	
	Flora Daito	10.02	
	Ginatilan Farmers Credit Cooperative	10.02	
	Isidra B. Sembrana	10.1	
	Marissa Bacalso	9.83	
	Susana Cinco	10.02	
Boljoon	KAMASA Inc.	50	50
Borbon	BTFAI	9.94	9.94
Carcar City	ANISFA	7.01	119.92
	COMAFA	14.02	
	LULACAPIUFA	81.89	
	VIFA	17	
Catmon	DMPC	8.14	60.81
	TAFA	12.21	
	TUPA	40.46	
Cebu City	GMFAI	55.18	108.29
	PSCFAI	20.09	
	SFA	25	
	SNFA	8.02	
City of Naga	TFA	85.11	85.11
Dalaguete	DALIDA	50.34	50.34
Dumanjug	UFAK Inc.	70	70
Malabuyoc	SALTA Inc	70	70
Minglanilla	CMFA	20.01	20.01
Pilar	NAKASE	9.84	9.84
San Fernando	Jocelyn Sabellano	3	128.94
	LULACAPIUFA	75.95	
	Manuel Genarge	16.99	
	Silvino Araas	6	
	ULFA	27	

Municipality/City	Organization	Number of Hectares	Total
Province of Cebu			
San Remigio	BUFFA	7.27	91.48
	KMKB	60.98	
	KARFAI	13.87	
	LUVICA	9.36	
Sibonga	KNKM	10.94	10.94
Sogod	PANFA	4.91	4.91
Tabogon	TERMA	10.6	10.6
Tabuelan	BOTIFA	4.94	15.67
	MAFA	4.87	
	VGPFA	5.86	
Talisay City	CAMMITA	40.56	40.56
Toledo City	FRIENDS	21.8	21.8
Tuburan	AFA	34.85	565.47
	AUFA	102.39	
	BFA	20	
	CFA	24.99	
	GFA	4.88	
	KKK	70.04	
	KMM	40.02	
	KPMK	40	
	LUFA	25.07	
	MAUFA	45.05	
Province of Negros Oriental			
Amlan	Kapatiran Para sa Progresong Panlipunan, Inc.	7.47	13.53
	PATULAKAS	6.06	
Ayungon	Akalabanan	1.3	91.7
	AFMO	40.09	
	JFA	10	
	LUFA	13.71	
	MAFA	26.6	
Bais City	MAFLIP	55.02	208.06
	PISFFAI	153.04	
Basay	BM	5.04	92.48
	CHTAU	10.07	
	MTPAI	47.18	
	MLBMICCA	20.12	
	SCSOSFA	10.07	

Municipality/City	Organization	Number of Hectares	Total
Province of Negros Oriental			
Bayawan City	KATBA	10.27	59.97
	SIGUPFAS	10.53	
	UFAT	24.03	
	VILLAFORMA	15.14	
Bindoy	Elvie Letchedo	5.01	136.26
	LGU Bindoy	63.19	
	Lory Amorganda	5	
	MAFA	20.01	
	NUFAI	33.02	
	Reynal Letchedo	10.03	
Canlaon City	PAFFWA	10	10
Dauin	CUFA	5.1	20.14
	LFA	15.04	
Guilhulngan City	BU – Bulado	10	73.13
	BHAFA	10	
	Jose Memis	10	
	KMMT	10	
	KPKAI	21.12	
	MAFA	10	
	NUFAI	2.01	
Jimalalud	BU Eli	15	81.91
	BU Pacuan	40	
	UPABFA	26.91	
La Libertad	BU AninLaw	5	5
Mabinay	ANLNMKTB	10	30.32
	BU Bagtic	8.42	
	DABKA	5.01	
	LGU Bindoy	6.89	
Manjuyod	BU Bagtic	1.58	25.22
	KABALU	10	
	LGU Bindoy	13.64	
San Jose	PATULAKAS	9.02	9.02
Siaton	BUFA	10.14	60.03
	BAGFAFAS	6.08	
	DAPIPA United Farmers	5.07	
	JFA	5.01	
	MAFILFA	10.1	
	MSFA	5	
	MEPAI	5.48	

Municipality/City	Organization	Number of Hectares	Total
Province of Negros Oriental			
	NTB Small Farmers	5.13	
	PNBC Farmers Assoc	5.09	
	Rene V. Vendioal	2.07	
	SOFA	0.86	
Sibulan	BFFA	29.52	123.86
	CUFAI	54.62	
	FAMASE	35.34	
	Kapatiran Para sa Progresong Panlipunan	4.38	
Sta. Catalina	ATEFA	24.05	112.87
	BFFA	5.61	
	Else Siraot	3.07	
	KKA	10.05	
	MAFARMPUCO	5.02	
	MEPAI	4.59	
	Marites Kinol	3	
	NASFA	15.08	
	Reymar Tablate	3.06	
	SOFFA	5.06	
	SOFA	19.18	
	SEKKAI	10.08	
	UFERA	5.02	
Tanjay City	Kapartian Para sa Progresong Panlipunan	3.25	112.46
	PISFFAI	109.21	
Tayasan	BU Cabang	10	131.68
	DATACOFA	10	
	GFA	10	
	LAFA	0.36	
	LIA	60	
	MAFA	10.02	
	Mar Taub	10	
	NUFAI	5.01	
Valencia	CUFAI	0.69	20.72
	MIMEUFA	20.03	
Total			**1,418.36**

Annex C. Registered Bamboo Plantations in Cebu and Negros Oriental

Plantation Owners	Location	Species	Number of Clumps
Province of Cebu			
Edilberto Alivio (Sole Heir of Late Pantaleon Alivio)	Guba, Cebu City	Kawayan Tinik	25
Manuel Sinoy	Tabogon	Kawayan Tinik	8
Heir of Vicente Etcuban	Daanbantayan	Kawayan Tinik	9
Heir Teodoro Angtud	Daanbantayan	Kawayan Tinik	7
Pablo Arcenal	Daanbantayan	Kawayan Tinik	9
Heir of Almira Cuna	Daanbantayan	Kawayan Tinik	6
Heirs of Eladia de Pabiran	San Remigio	Kawayan Tinik	55
Heirs of Simeon Miranda	Medellin	Kawaya Tinik/ Kawayan Bujo	224
Heirs of Zoila Cabahug	Tabogon	Kawaya Tinik/ Kawayan Bujo	16
Arlene Leonardo Olivar	Danao City	Kawayan Tinik	3
Athecor Development Corporation	Talamban, Cebu City	Kawayan Tinik	1
Cebu Powertrade Corporation	Mandaue City	Kawayan Tinik	1
Romulo Baylon	Daanbantayan	Kawayan Tinik	2
Stephen Go	Minglanilla	Kawayan Tinik	1
Heirs of Antero Blasé	Asturias	Kawayan Tinik	8
Baas Fields Company	Tabogon	Kawayan Tinik	16
Romulo Baylon	Daanbantayan	Kawayan Tinik	2
Stephen Go	Minglanilla	Kawayan Tinik	1
Heirs of Antero Blasé	Asturias	Kawayan Tinik	8

Plantation Owners	Location	Area	Species	Number of Clumps	Remarks
Province of Negros Oriental					
Crisant P. Banua et. al. represented by Jegi Pelenio	Siaton	3.3518	Kawayan Tinik	9	Issued
Juan Radoc represented by Flordeliza Quisay	Siaton	2.0046	Kawayan Tinik	2	Issued
Sps Alfredo Martinez and Norma Lasa represented by Rufino B. Abordo	Bais City	2.9078	Kawayan Tinik	3	Issued
Antonia Ege	Siaton	0.4208	Kawayan Tinik	2	On process
Rene V. Vendiola	Siaton	2	Kawayan Tinik		On process under eNGP Project Family Base Approach
Celso Mlina	Bayawan City	4.3119	Kawayan Tinik/ Kawayan Kiling	5/3	On process
Edgardo dela Cruz represented by Eder V. Guerero	Bayawan City	1.029	Kawayan Tinik	6	On process
Ponciano Ambos	Mabinay	1.001	Kawayan Tinik/ Giant Bamboo	1/3	On process
Isidro Yap represented by Daphne Cofreros	Mabinay	10.3967	Kawayan Tinik	9	On process
Honorato Pojas	Siaton	1.5659	Kawayan Tinik	2	On process
Esmeraldo Sastre	Siaton, Neg Or	1.5636	Kawayan Tinik	6	On process

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