Abante Bohol!

Provincial Commodity Investment Plan

(With Climate Change Adaptation PAPs)

BUFFALO DAIRY

CY - 2024

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List of Abbreviations & Acronyms

A and D	Alienable and Disposable
ACFT	Annual per Capita Food Threshold
ACPT	Annual per Capita Poverty Threshold
AES	Agro-Edaphic Suitability
AIP	Annual Investment Plan
ADP	Annual Development Plan
ARMM	Autonomous Region in Muslim Mindanao
BALA	Bohol Livestock Aide
BEMO	Bohol Environment Management Office
BFAR	Bureau of Fisheries and Aquatic Resources
BODACO	Bohol Dairy Cooperative
BODPA	Bohol Dairy Producers Association
BOI	Board of Investments
BONACGA	Bohol Native Chicken Growers Association
BPSFPC	Bohol Provincial Seaweed Farmers Producers Cooperative
CCA	Climate Change Adaptation
CDA	Cooperative Development Authority
CLUP	Comprehensive Land Use Plan
CPT	Commodity Prioritization Tool
CSO	Civil Society Organization
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DRRM	Disaster Risk Reduction and Management
DTI	Department of Trade and Industry
ELA	Executive Legislative Agenda
EO	Executive Order
E-VSA	Expanded Vulnerability and Suitability Assessment
FA	Farmers' Association
FMR	Farm-to-Market Road
GAP	Good Agriculture Practices
GEF	Global Environmental Facility
I-BUILD	Intensified Building-Up of Infrastructure and Logistics for Development
IEC	Information Education Campaign

IP	Indigenous People
I-PLAN	Investment for AFMP Planning at the Local and National Levels
I-REAP	Investments for Rural Enterprises and Agricultural and Fisheries Productivity
LGU	Local Government Unit
M&E	Monitoring and Evaluation
MCPI	Marine Colloids for Pilipino Integrity
MLGU	Municipal Local Government Unit
MOA	Memorandum of Agreement
MPA	Marine Protected Area
NCIP	National Commission on Indigenous Peoples
NDA	National Dairy Agency
NGA	National Government Agency
NMIS	National Meat Inspection Service
NOL	No Objection Letter
NPCO	National Project Coordination Office
NSCB	National Statistical Coordination Board
OPA	Office of Provincial Agriculturist
OPV	Office of Provincial Veterinarian
PCA	Philippine Coconut Authority
PCC	Philippine Carabao Center
PCIC	Philippine Crop Insurance Corporation
PCIP	Provincial Commodity Investment Plan
PCPT	Provincial Core Planning Team
PDC	Provincial Development Council
PDPFP	Provincial Development Physical Framework Plan
PGBh	Provincial Government of Bohol
PLGU	Provincial Local Government Unit
PMIU	Provincial Program Management and Implementing Unit
PO	People's Organization
PPDO	Provincial Planning and Development Office
PRDP	Philippine Rural Development Project
PSA	Philippine Statistics Authority
RBMES	Results-Based Monitoring and Evaluation System
RDS	Raw Dried Seaweed
RPC	Rice Processing Center
RPCO	Regional Project Coordination Office
RROW	Road Right-of-Way
SEAFDEC	South East Asian Fisheries Development Center
SES	Social Environmental Safeguard
SIAP	Seaweed Industry of the Philippines
SP	Sangguniang Panlalawigan
SRC	Semi Refined Carrageenan
SSS	Social Security System
SWCF	Soil and Water Conservation Foundation
TWG	Technical Working Group
VCA	Value Chain analysis

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INTRODUCTION

Bohol is one of the selected recipient provinces of the Philippine Rural Development Project (PRDP). PRDP is designed to establish an inclusive and market-oriented agri-fishery sector through strategic investments in priority commodity value chains. It is a poverty reduction platform that aims to improve the incomes and food security of the rural poor. Through a Memorandum of Agreement, the Department of Agriculture (DA) and the Province of Bohol have come into a joint partnership in implementing the PRDP. Both DA and the Province will partner with local government units (LGUs) and the private sector in providing key infrastructure, facilities, technology, and information that will raise incomes, productivity, and competitiveness in the countryside.

To ensure the successful implementation of the Project, the Governor issued Executive Order No. 05, Series of 2015, creating the Provincial Core Planning Team (PCPT) that is chaired by the Provincial Agriculturist. The PCPT is tasked as the principal mechanism through which the Provincial Commodity Investment Plan (PCIP) will be prepared. The PCIP of Bohol is a 3-year strategic plan that highlights the identified priority commodities of the province for an inclusive, value-chain based and climate smart agriculture that will contribute to the vision towards a strong and balanced agri-industrial province.

The adopted planning approach for PCIP formulation is anchored on the use of the value chain approach (VCA) to objectively identify interventions to develop or enhance priority commodities. A value chain is defined as *the full range of activities that are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use.*[1]

To enhance the value chain approach of planning, scientific tools are used such as the Expanded Vulnerability and Suitability Assessment (E-VSA). It is a user-based online tool available at the PRDP website that uses the VSA result as a database and is collaborated with socio-economic parameters.

Another important tool used to identify priority commodities is the Commodity Prioritization Tool (CPT). The major criteria for this tool are: suitability, market potential, impact on the poor, and the number of beneficiaries. The identified priority commodities of the province are: coconut, dairy, native chicken, swine, buffalo dairy, cassava, inland fishery, mariculture (seaweed), cacao and coffee. These identified commodities that are of great importance to the agricultural development of Bohol will undergo the value chain analysis. As soon as the value chain report will be approved it will start the preparation and integration of the commodity into the PCIP.

The PCIP will serve as a basis of all interventions relative to the commodities identified. Funding for I-BUILD and I-REAP sub-projects will be incorporated in the plan for the selection of eligible interventions. Infrastructure projects and commodity enterprises within this plan shall be the priority projects of the Provincial Government in agriculture, livestock and fisheries.

[1]J. Hellin and M Meijer. *Guidelines for Value Chain Analysis*, (FAO) November 2006, p. 4.

The interim approach in updating the PCIP for PRDP Scale-Up implementation focuses on the integration of Climate Risk Vulnerability, particularly the incorporation of Major Climate Risks and Risk Adaptation Measures in the existing PCIP Matrices. This approach will likewise serve as a bridge for planners at all levels to progressively familiarize themselves on climate-resilient investment planning.

Chapter I: Development Background

There is an apparent necessity to address certain issues that have been hindering the full development of agricultural land in Bohol. Foremost, there are still large areas of idle lands in the province, unutilized or underutilized for agriculture. Only half of the total agricultural area of the province is planted to major crops. With this level of land utilization, there is still a substantial potential for the province to enhance its agricultural productivity and harness other crops suitable for its soil and weather conditions.

Technologies to maximize the upland areas have not yet been fully accepted and practiced by farmers. There is low level of adoption and application of location specific agri-aqua technologies. Many of the rural poor are landless, or have limited farm lands, which may not be appropriate to achieve viable financial returns. Insufficient farm equipment, support infrastructure and production and postharvest facilities also is a challenge in the sector that needs improvement of existing farm equipment and the provision of additional farm machineries and support facilities. Development of agricultural lands has also been impeded by lack of accessibility and poor road networks that link farms to production support facilities and markets. Bohol's development challenges can be summarized as pertaining to underutilization of agricultural lands and small, limited landholdings with an average farm size of only 0.6 hectare; poor farm to market road system; and low production due to inefficient and insufficient modern farm or agricultural technologies.

The agricultural development of the province is a collaborative effort among stakeholders. The Philippine Rural Development Project (PRDP), thru the Department of Agriculture (DA) and funded by the World Bank is extending different projects with the objective of alleviating the poverty situation of the Boholano farmers. The Provincial Commodity Investment Plan (PCIP) is one of the requirements needed for project implementation. The PCIP is a strategic plan that substantiates the interventions within the various segments of the value chain of the commodity, which shall become the basis for PRDP's I-BUILD and I-REAP in selecting subprojects for funding.

The Bohol PCIP undertakes a series of consultation with various stakeholders. The issuance of No Objection Letter (NOL) by the National Project Coordination Office (NPCO) dated June 8, 2017 through Memo No. 801-2017 and the presentation of the VCA results to the Provincial Governor and the PCPT indicates the integration of the approved commodity to the PCIP. The buffalo dairy is the fourth priority commodity of the province that is with a PCIP, along with highland vegetables, native chicken and seaweeds.

The approved Buffalo Dairy VCA with NOL was presented by RPCO to the Provincial Development Council last June 27, 2017. Being participatory, the planning process includes technical review and stakeholders' consultation with various actors along the chain from the input supplier, producer, processor and traders. The Buffalo dairy Stakeholders' Consultation was conducted last August 9, 2017 with strong participation by both private and public players in the industry. The PCIP was presented and approved by the Provincial Development Council last September 8, 2017. The PLGU may also use the PCIP to mobilize resources from other fund sources other than PRDP, such as other National Government Agencies (NGAs) and the private sector.

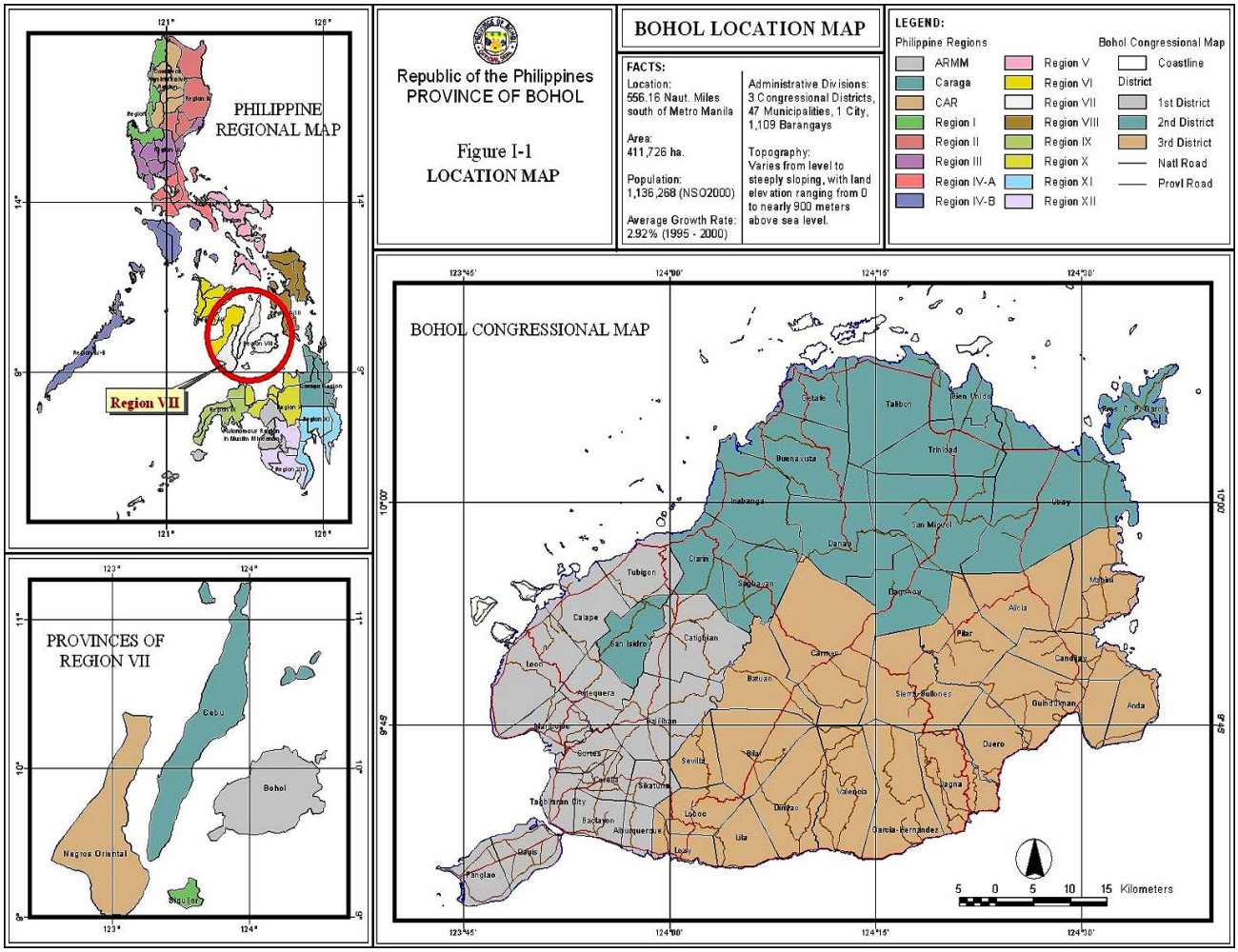
Geographic Profile

Location

Bohol is an island province of the Philippines located in the Central Visayas Region (Region 7) consisting of Bohol Mainland and 75 minor surrounding islands. It is one of four provinces in Region VII with 47 municipalities and one city, Tagbilaran City, serving as its capital. About 1,109 barangays comprise its administrative area of jurisdiction grouped into three congressional districts.

Bohol is the tenth largest island of the Philippines, with a land area of 4,117.26 square kilometers (1,589.68 sq. mi) and a coastline of about 261 kilometers (162 miles) long. To the west of Bohol is Cebu Province, to the northeast is the island province of Leyte and to the south, across the Bohol Sea is Mindanao.

Map 1. Bohol Location Map



Topography and Slope[2]

- **Topography Range**

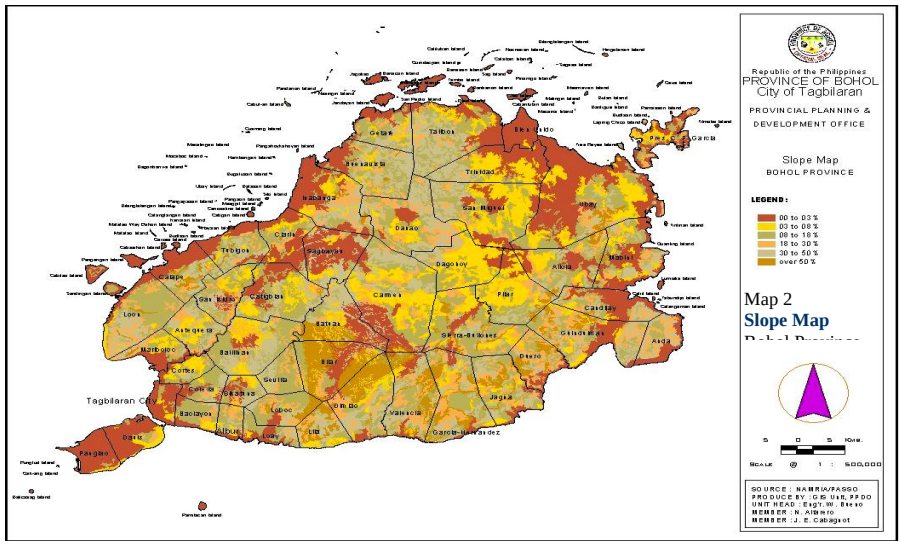
Bohol's terrain is variable from nearly flat at the plains to low rolling, moderate to very steep sloping with 5 to 50 meters high cliffs in the Sierra-Bullones limestone formation. The more rugged terrain is found in the southern part of the province although the Ubay volcanic rocks and Boctol serpentinite in the north and northeast are of moderate and rugged slopes in most of their outcrop areas. The central valley is almost rolling to moderately steep.

There are several mountain ranges found in Bohol. Two sets of them are found in the northeastern side of the mainland and located between the municipalities of Alicia and Ubay that generally trend to the north and south directions with a maximum elevation of about 404 meters above sea level. Farther east are two other mountain ranges, the Mt. Tanawan and Mt. Candungao with 460 and 500 meters elevation, respectively. Both are prominent landmarks rising as they do several meters above the surrounding landscape. From Mt. Tanawan going southwestward, it declines gradually in height until it finally joins southwestwardly the foothills of Calape. The main range of hills extending from Calape joins to the southwestwardly trending mountain range from the interior, runs south and out to Loon Peninsula terminating in Punta Cruz, Maribojoc. The Sierra Bullones Range follows roughly the trend of the south coast. The highest point of this range and in the entire province is Mt. Mayana in Jagna town with a height of 827 meters above sea level.

- **Slope Range[3]**

The province has six slope ranges from level to very steep. Level to nearly level sloping areas are mainly located along the coast and in the outer islands. The steep slopes are prevalent in the mountainous area, covered mainly by carbonate rocks (Wahig Limestone), volcanic extrusive and magmatic rocks (Ubay Volcanics and Jagna Andesite). *Map 2* and *Table 1* show the slope categories and the corresponding area covered in hectares.

Map 2. Slope Map, Bohol Province



[2] Bureau of Soils and Water Management, DA, Region 7, Cebu City

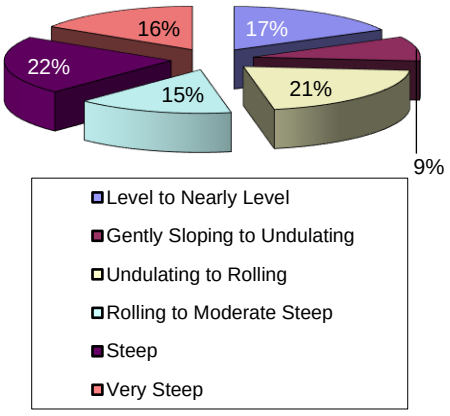
[3] Philippine Land and Soil Management Atlas for Central Visayas

Table 1. Slope Classification, Bohol Provinces

Slope Category	Classification	Area Covered (Has)	% Distribution
0 - 3 %	Level to nearly level	71,289.00	17.31%
3 - 8 %	Gently sloping to undulating	37,519.00	9.11%
8 - 18 %	Undulating to rolling	84,902.00	20.63%
18 - 30 %	Rolling to moderately steep	62,473.00	15.17%
30 - 50 %	Steep hills& mountains	89,507.00	21.75%
50 % >	Very Steep hills	6,040.00	16.04%
Total		**411,726**	**100%**

Source: ***BSWM, DA, Region7, 1992***

Figure 1. Slope Classification in Bohol

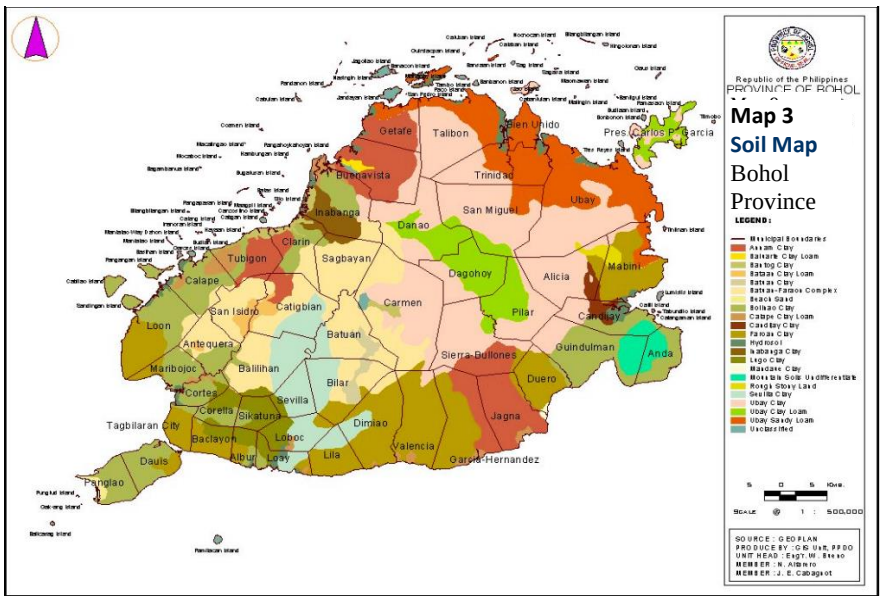


- **Soil Types**[4]

According to the Bureau of Soils and Water Management (BSWM Region 7, Cebu) there are 22 different types of soil that can be found in Bohol, which differ mainly in physical, chemical and morphological characteristics. The soil depth is relatively thin ranging from a minimum depth of 24 centimeters to a maximum of 30 centimeters. Most of the hills and ridges have meager to no soil cover due to fairly rapid surface drainage over most of the province's land. Clay soils with fine textures are predominant throughout the island province. The dominant soil type is Ubay Clay found in the northeastern part of Bohol constituting 19.34 percent or 79,644 hectares of the total land area of Bohol.

The soil derived from all rock types are generally clay and silty with sandy soil limited in some parts to the coastal area. Soils on steep to very steep side slopes (18-50%) are clay loam to clay. Gently sloping to undulating (3-8%) is clay while the narrow alluvial valleys are silty clay to clay. The soils in the province are predominantly brown having moderate to high inherent fertility *(Map 3)*.

Map 3. Soil Map, Bohol Province



[4] Bureau of Soils and Water Management, Department of Agriculture 1992, Region 7, Cebu City

Existing Land Use and Vegetative Cover[5]

The province of Bohol has five major land uses, i.e., agricultural land, grassland/shrubland, woodland, wetland and miscellaneous land that includes built-up areas, reservoirs and mine sites *(Map 4)*. Almost one-half of the province's total land area is covered by grassland/shrubland, while one-third of its total area is utilized for agricultural activities. About 67% of Bohol's land is used for agriculture while forestland occupies 25% of the province's total land area.

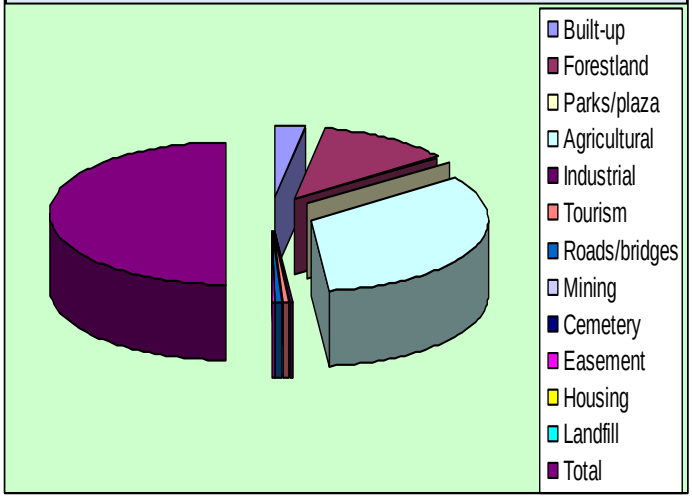
The province has a larger coverage of woodland (10.69%) compared to Cebu and some other provinces in the region. Wetland constitutes 4.92%, which includes mangrove, nipa, beach sands and fishponds while built-up areas comprise 10.22%.[6]

Table 2. Existing Land Use Distribution in Bohol

Built-up	21,882	5.32%
Forestland	101,271	24.61%
Parks/plaza	196	0.05%
Agricultural	273,950	66.56%
Industrial	2,672	0.65%
Tourism	3,663	0.89%
Roads/bridges	4,612	1.12%
Mining	1,138	0.28%
Cemetery	115	0.03%
Easement	1,916	0.47%
Housing	69	0.02%
Landfill	102	0.02%
Total	**411,586**	**100.00%**

Source: ***Approved Municipal/ City Land Use Plan***

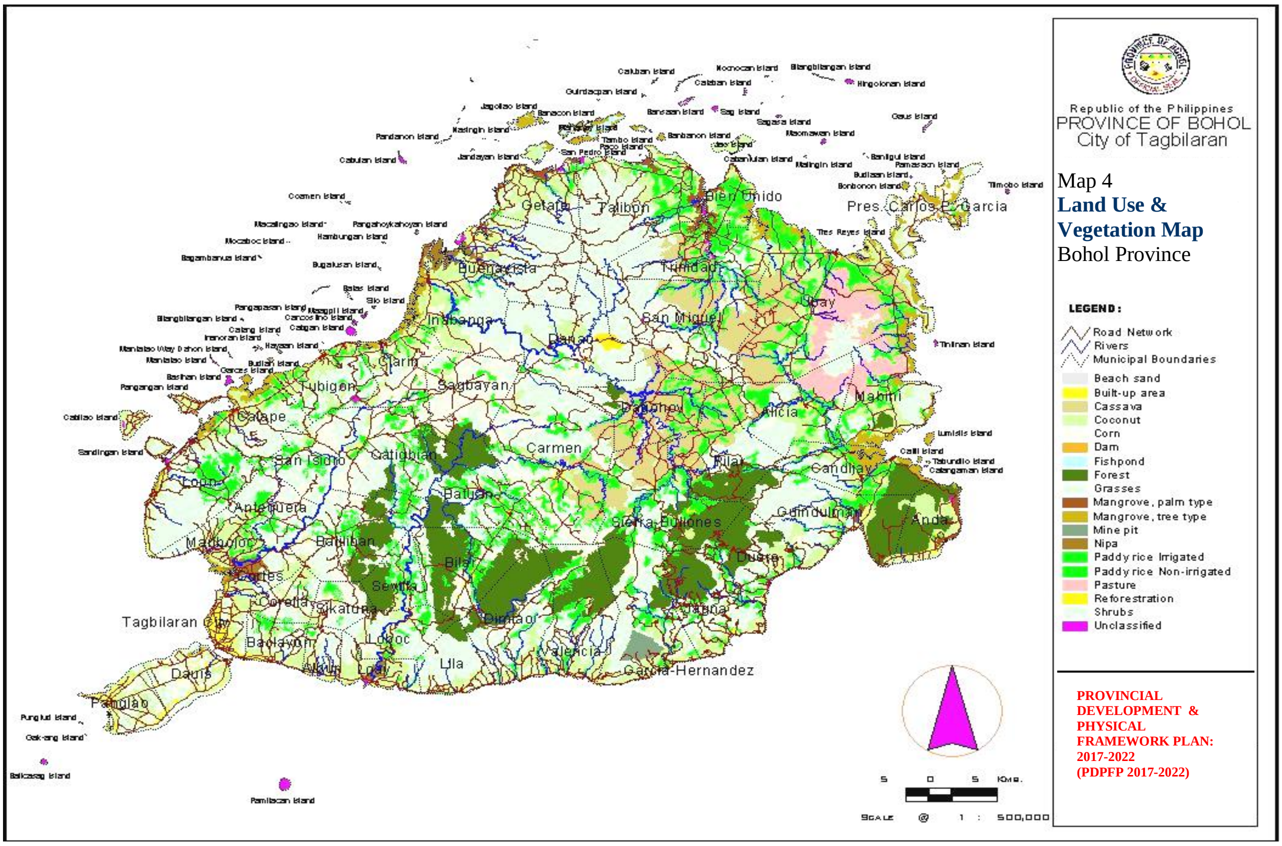
Figure 2. Present Land Use & Vegetation Cover, Bohol Province



Mangrove forests play a very vital role in shaping the ecology and economy of the Boholanos. Ecologically, mangroves are among the most productive coastal resources of Bohol as they serve not only as feeding, breeding and nursery grounds for many aquatic and terrestrial animals, but also as a protective structure against destructive waves and currents along the shoreline. Bohol has the biggest mangrove area in Central Visayas at 16,287.42 hectares. The biggest mangrove stands are located in Getafe, Talibon, Ubay, Pres. Garcia, Mabini and Candijay municipalities. The province also has the most diverse mangrove ecosystem in the Philippines with some 32 identified species. The largest and most diverse mangrove area is found in Cogtong Bay, which is bounded by Mabini and Candijay towns and covers an area of 2,200 hectares[7]. The most popular man-made mangrove forest in Bohol is around Banacon Island in Getafe town comprising an area of 1,750 hectares.

[5] Bohol Ecological Profile of DENR, 1992
[6] Bohol Ecological Profile, DENR 1992
[7] Bohol Coastal Environment Profile of 2002

Map 4. Land Use and Vegetation Map, Bohol Province



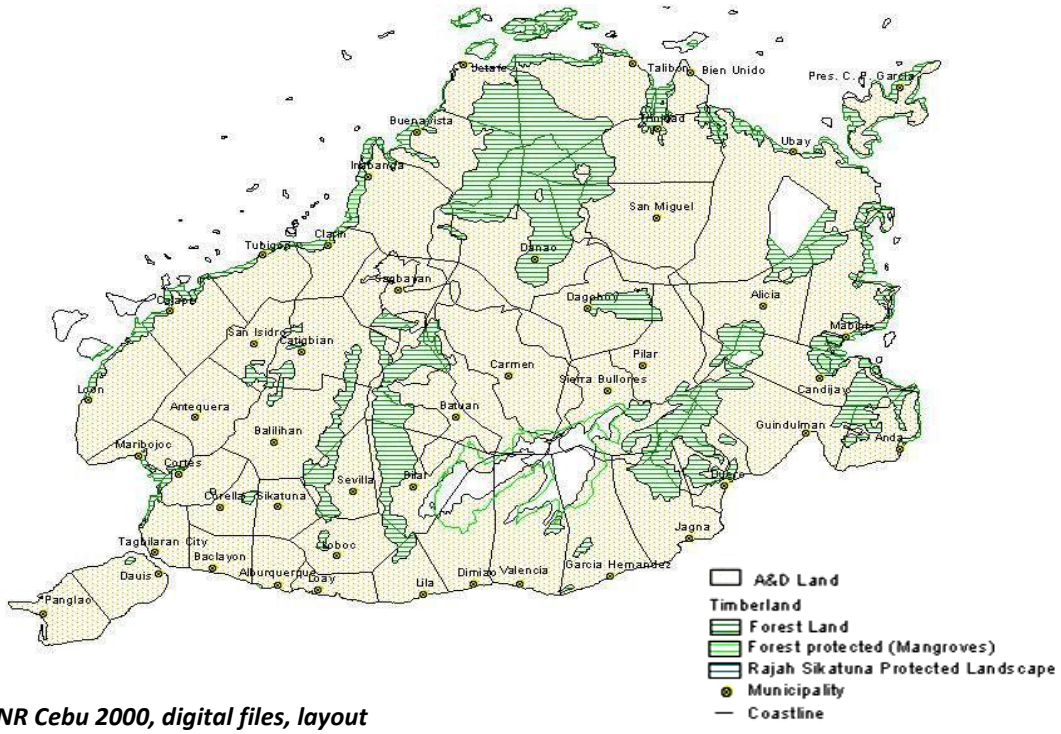
Land Classification[8]

The total land area of Bohol Province is approximately 411,726 hectares representing 43% of the region's land area and 1.4% of the total land area of the Philippines. About 75% are classified as alienable and disposable (A & D) land. The total area devoted to agricultural use is 273,950 hectares or 66 percent of the total land area of the province. Of the total agricultural area, 54 percent or 148,673 hectares is utilized for the planting of major crops such as rice, corn, coconut and rootcrops. The estimated land area as potential irrigable areas in the province is 40,800 hectares. The existing irrigable and non-irrigable rice lands are classified as priority focus for agricultural production.

Bohol's public forestland or timberland occupies an area of about 101,271 hectares or roughly 25 % of its total land area. Almost 15% or 75,766 hectares of the province's land area is under protection through NIPAS System and are classified as environmentally constrained and critical areas.

[8] Department of Environment and Natural Resources (DENR), 2000

Map 5. Land Classification Map, Bohol Province



Source: ***DENR Cebu 2000, digital files, layout***

Physical Resources

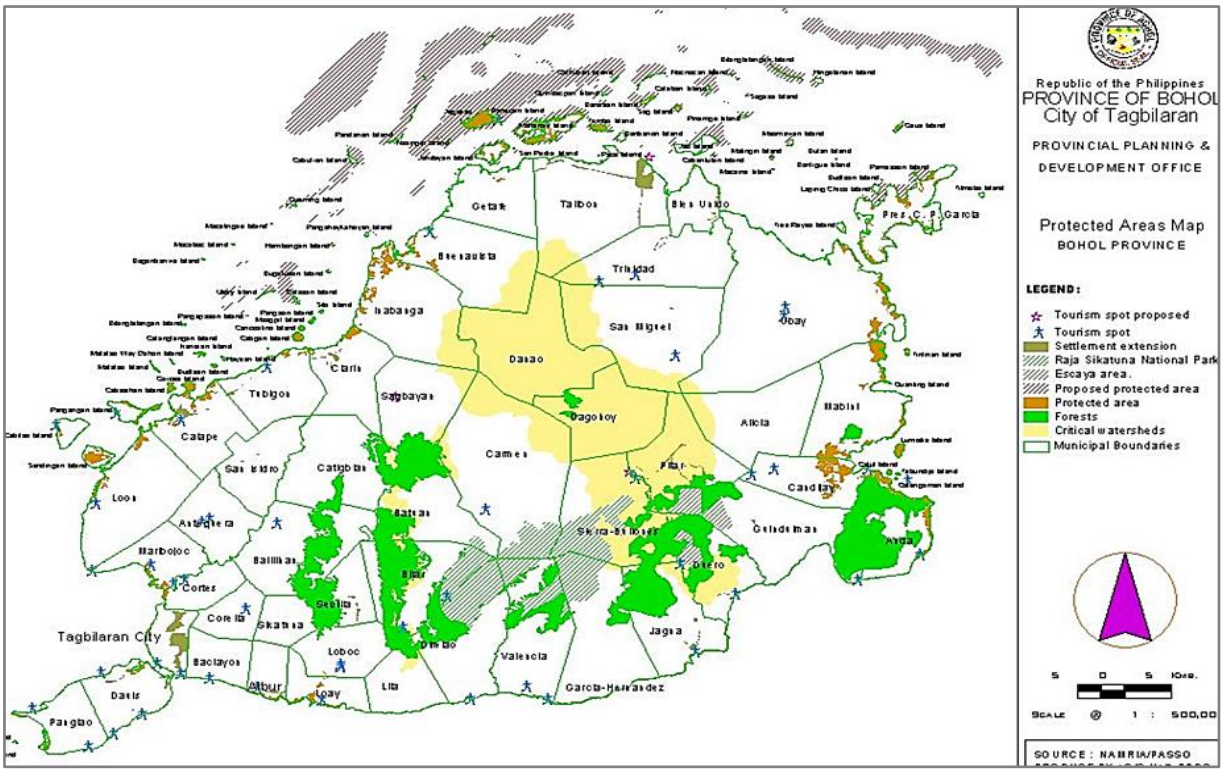
Bohol is endowed with a rich biodiversity and natural resources that play an essential role in guiding its future development for agriculture, industry, tourism, settlements, culture and infrastructure in both the medium and long-term time frame. It has a high diversity of flora and fauna found in the different ecosystems of the island such as its forests, reefs, farmlands, in zones along creeks and rivers, caves and marine areas. The quality of life in any given area is extremely dependent on the vibrant condition of these ecosystems and biological resources.

Bohol has a total land area of 411,726 hectares with 654 kilometers of coastline and 6,245 square kilometers of municipal waters covering its major islands and islets. The province is within four major resource boundaries, i.e., upland/forestry, lowland/agriculture, coastal/marine and water boundaries.

Bohol's water supply system for domestic, agricultural and industrial uses is mainly based on 2,224 springs, 59 rivers and 200 creeks. There are 22 rivers basins/watersheds that are valuable sources of water for drinking and irrigation. Surface water from rivers and streams in these basins are impounded and distributed for irrigation, electric generation, industrial use as well as for domestic use.

Surface water in Bohol feeds its watersheds. There are 3 major watersheds in the province that have been declared as protected areas under the NIPAS. The largest reserve is the Wahig-Inabanga Watershed covering 16 municipalities with an aggregated area of 14,000 hectares. The second, and first to be proclaimed as a watershed forest reserve in Bohol is the Loboc Watershed with an area of 10,450 hectares, part of which is inside the Rajah Sikatuna Protected Landscape. The third is the Duero Watershed (that covers an area of 3,620 hectares. The map below shows the location of these watersheds.

Map 6. Protected Areas Map, Bohol Province



Bohol's public forestland or timberland occupies an area of about 101,271 hectares or roughly 25 % of its total land area. Almost 15% or 75,766 hectares of the province's land area is under protection through NIPAS System and are classified as environmentally constrained and critical areas.

In terms of biodiversity assets, Bohol has a high biodiversity level of plant species categorized as: upland, mangrove, coastal areas, cave entrances, cultivated cropland and intensively used lands. Several plant species noted to be abundant before are already extinct, others are becoming rare.

The Province has the biggest mangrove forest in Southeast Asia located in Banacon, Getafe. There are about 1,200 species of crabs and shrimps with over 6,000 mollusks species found in 15,000 hectares of Baclayon, Dauis and Panglao (Bohol Marine Triangle). Bohol has one of the six (6) World-renown Double Barrier Reefs - the Danajon Double Barrier Reef, covering 13 municipalities. The province has a total of 1,920 hectares of coral reefs and its coastal ecosystem provides the major source of animal protein for the populace.

Risk Profile[9]

The Province of Bohol is prone to a wide range of natural and human-induced hazards such as flooding, rain-induced landslides, earthquake, storm surges, liquefaction, fire, air and water pollution, and contaminated land. Inappropriate location and design of developments can aggravate exposure to and impact of hazards and climate change impact like sea-level rise, storm surges, among others.

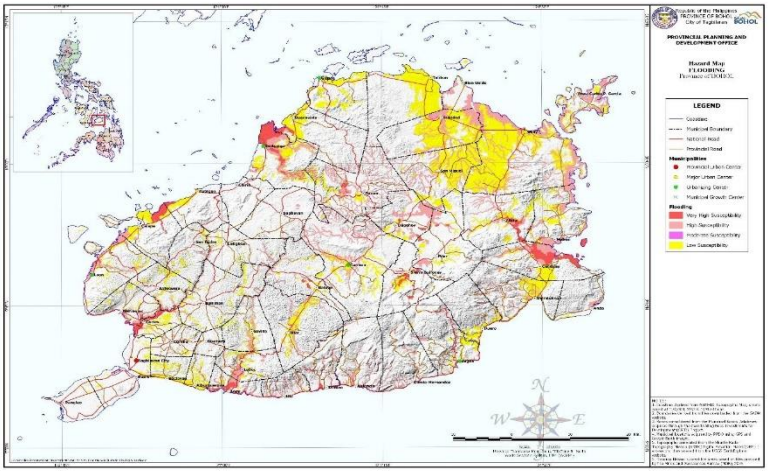
Hydrometeorological Hazards

Bohol's climate, as classified by PAGASA, belongs to Corona's 4th Type which is characterized by rainfall more or less evenly distributed throughout the year. Intensification of the southwest monsoon usually occurs during the months of July to October. The rainfall varies from about 1,200 mm/yr. around the coast to slightly more than 2,200 mm per year in the mountainous areas in the province. Based on the climatological records of Tagbilaran City weather station, the province has an annual average of 161 rainy days. Average rainfall and trend have illustrated a declining trend of 250 mm over a period of 35 years of about 7mm a year due likely to climatic change in the Southeast Asian Region. The coastal area of the province is warm in contrast with the interior part, which is colder especially during the night. Mean temperature is at 27.40 degrees Celsius.

- ***Flooding***

Flood-prone areas in Bohol include the influence areas of the eleven major rivers namely: Inabanga, Loboc, Abatan (Maribojoc), Moalong (Loon), Ipil (Trinidad), Soom (Trinidad), Carood (Mabini), Lumbay (Pilar), Alejawan (Duero), Manaba (Garcia) and Panangatan (Dimiao) Rivers. Aside from the areas where the rivers are located, the following towns were sites of flooding in 2011, namely: Jagna, Valencia, Guindulman, Alicia, Bien Unido, Clarin, Sagbayan, and Antequera. These areas adjacent to the rivers have been the subject of seasonal destructive flash flooding which caused substantial damage to agricultural land and crops, infrastructure, dwelling and occasional loss of lives. The primary factor which contributes to the occurrence of these hazards is the denudation of the forest cover in the upper watershed areas and river tributaries. This causes heavy siltation resulting in the incapability of the river waterways to handle heavy flash flood water flow from the rain catchment area (PDPFP 2016-2028).

Map 7. Flood Susceptibility Map, Bohol Province



Source: ***PPDO Bohol***

Based on the disaster risk analysis data as of 2020 (PDPFP 2016-2028) and on historical data, the municipalities with agriculture at risk

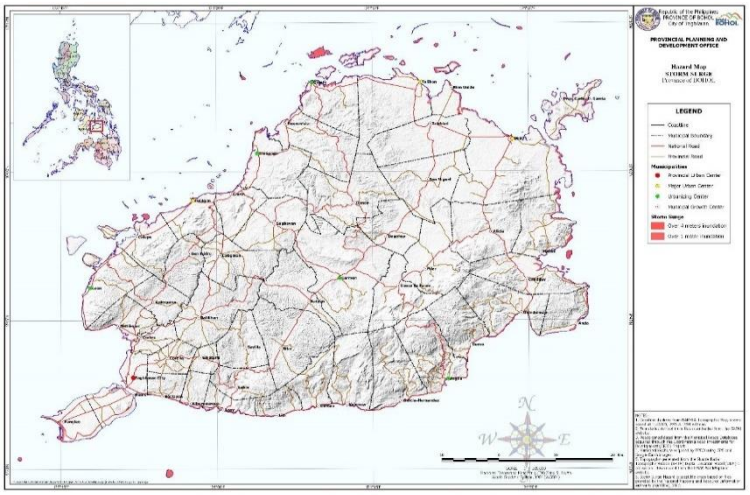
[9] Bohol Provincial Disaster Risk Reduction and Management Plan 2023-2025

to flooding are the following: Candijay, Alicia, Pilar, Batuan, and Mabini in terms of Agri-fisheries while Buenavista, Mabini, and Sevilla for fisheries alone, and they are considered as priority LGUs. Livestock at risk are mostly in Alicia, Candijay, Guindulman, and Mabini.

- ***Storm Surge***

Storm Surge, as defined by the PAGASA, is **the abnormal rise in sea level that occurs during tropical cyclones**. It is caused by strong winds and low atmospheric pressures produced by tropical cyclones. Most of the storm surge-prone areas are located in the southeastern, southwestern, northern and western portions of Bohol. The inundation coverage is estimated based on geomorphologic analysis and observation in the areas during interviews/surveys. The surge heights are computed using the data gathered during surveys in reference to the significant tropical cyclone occurrences and from storm surge model results.

Map 8. Storm Surge Hazard Map, Bohol Province



Source: ***PPDO Bohol***

The 30 coastal LGUs (Tagbilaran City, Dauis, Panglao, Baclayon, Alburquerque, Loay, Lila, Dimiao, Valencia, Garcia Hernandez, Jagna, Duero, Guindulman, Anda, Candijay, Mabini, Ubay, Trinidad, Pres. Carlos P. Garcia, Bien Unido, Talibon, Getafe, Buenavista, Inabanga, Clarin, Tubigon, Calape, Loon, Maribojoc, Cortes) with island barangays are prone to storm surge if aggravated by strong typhoons (PDPFP 2016-2028). Among the listed municipalities: Getafe, Panglao, Talibon, Calape, Tubigon, Inabanga, Candijay, Ubay, Loon and Tagbilaran City are the notably with high population at risk.

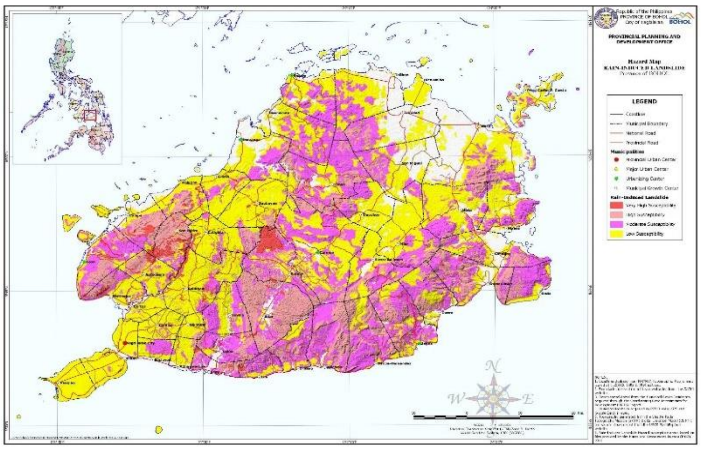
Based on current data available, 30 coastal LGUs are under high risk in agricultural areas to Storm Surge. The highlighted municipalities with agriculture at risk of storm surge are Talibon, Bien Unido, Ubay, Pres. Calros P Garcia, Panglao, Baclayon, Getafe, Anda, Mabini and Guindulman based on observation and discussions. Fish cages and seaweeds production areas are mostly affected.

- ***Rain-Induced Landslide***

Landslides, as defined by the Philippine Institute of Volcanology and Seismology (PHIVOLCS), **is the mass movement of rock, soil, and debris down a slope due to gravity**. Landslides triggered by intense rainfall are called Rain-Induced Landslides (RIL).

There are seven (7) municipalities in the province which are determined to be the priority LGUs considering frequent landslide occurrence and their severity, namely: Jagna, Valencia, Sagbayan, Sierra Bullones, Garcia-Hernandez, Dimiao and San Isidro. In addition to these, the municipalities of Duero, Bilar, Loboc and Sevilla are also considered to be more exposed than the risk analysis data and considered the priority LGUs as well.

Map 9. Rain-Induced Landslide Susceptibility Map, Bohol Province



Source: ***PPDO Bohol***

The agriculture areas at risk to RIL are highly observed in Sagbayan, Sierra Bullones, Jagna, Garcia-Hernandez and Duero, based on experience. A total of 176,775 hectares are potentially affected by rain-induced landslides in Bohol Province.

- ***Drought/El Niño***

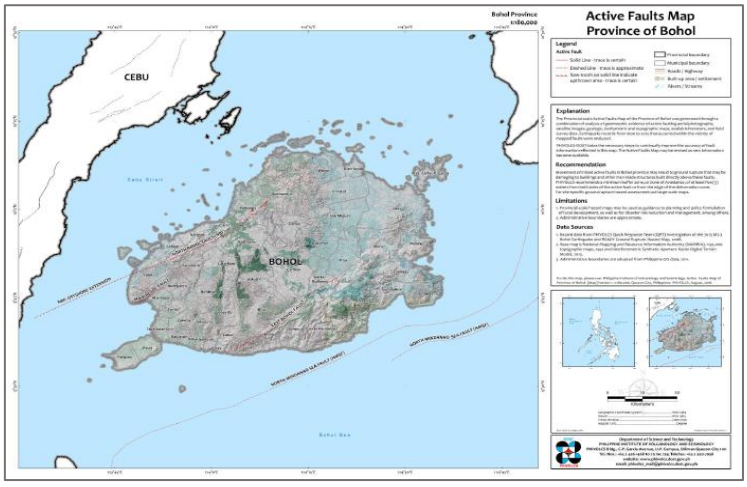
El Niño is the projected increase in temperature that will result in drought and drought-like conditions in the municipality. Drought is projected to have a high impact on the municipalities with mostly agriculture and fisheries.

Geological Hazards

Outline of Geological Hazards in Bohol Province

Geological hazards result from geologic processes acting on or beneath the earth's surface. These include earthquake, earthquake-induced hazards (ground shaking, ground rupture, earthquake-induced landslide, liquefaction, and tsunami), and volcanic hazards.

Map 10. Active Fault Map, Bohol Province



Source: ***PPDO Bohol***

Bohol is prone to geologic hazards like ground shaking, liquefaction, earthquake-induced landslide and tsunami because of the presence of East Bohol Fault and another fault located in the Bohol Sea going to Mindanao Sea facing the southern part of Bohol. The presence of Negros Trench and PFZ Central Leyte Fault may also contribute to the generation of earthquake. Geologic

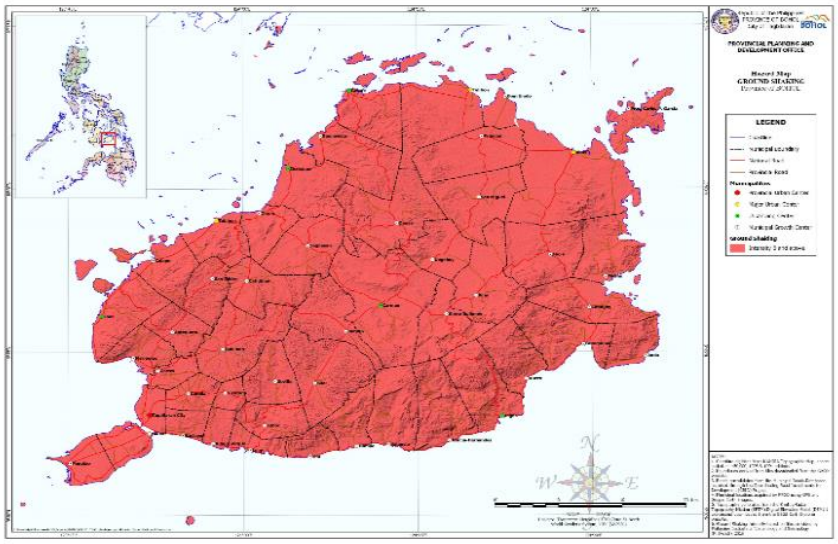
hazards result from geologic processes acting on or beneath the earth's surface. These include movement of plates in the earth's crust or from local concentration of heat and are a source of hazards to people and their natural and built- up environment on the earth's surface.

- ***Ground Shaking***

The immediate effect of an earthquake is **Ground Shaking**. PHIVOLCS describes ground shaking as the *disruptive up, down and sideways vibration of the ground during an earthquake*.

According to recent hazard map, majority of the provincial agricultural lands are highly exposed to ground shaking with a total exposed agricultural area of about 168,307 hectares or 70% of the total agricultural land area is within the very high to high exposure area.

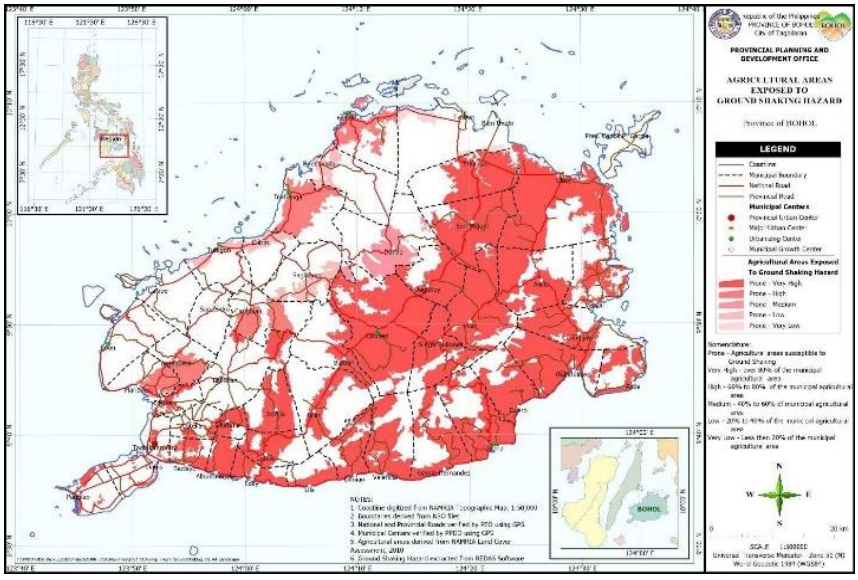
Map 11. Ground Shaking Hazard Map, Bohol Province



Source: ***PPDO Bohol***

At very high risk to ground shaking are the 36 municipalities and one (1) city of the province of Bohol with agricultural areas exposed to ground shaking. Out of these towns, the 27 municipalities and one (1) city have their entire agricultural areas highly exposed to ground shaking. At risk are the municipalities of Carmen, Ubay, Pilar, San Miguel, Alicia, Guindulman, Trinidad, Sierra Bullones, Candijay, Dagohoy, Garcia Hernandez, Jagna and Valencia having more than 10,000 hectares of their agricultural area highly exposed to ground shaking (PDPFP 2016-2028).

Map 12. Agricultural Exposure Map to Ground Shaking, Bohol Province

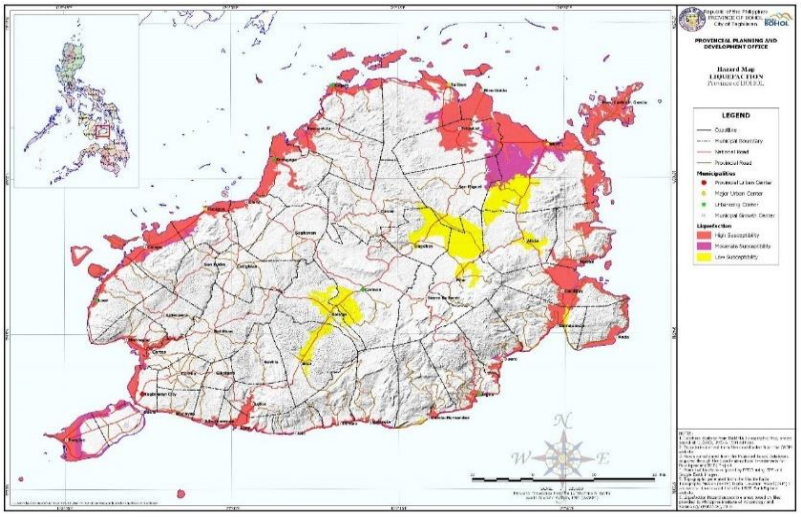


Source: ***PDPFP 2016-2028/ PPDO Bohol***

- ***Liquefaction***

Liquefaction is the phenomenon wherein sediments, especially near bodies of water, behave like liquid similar to a quicksand. Such could lead to sinking and/ or tilting of structure above it, sand boils and fissures.

Map 13. Liquefaction Hazard Map, Bohol Province



Source: ***PPDO Bohol***

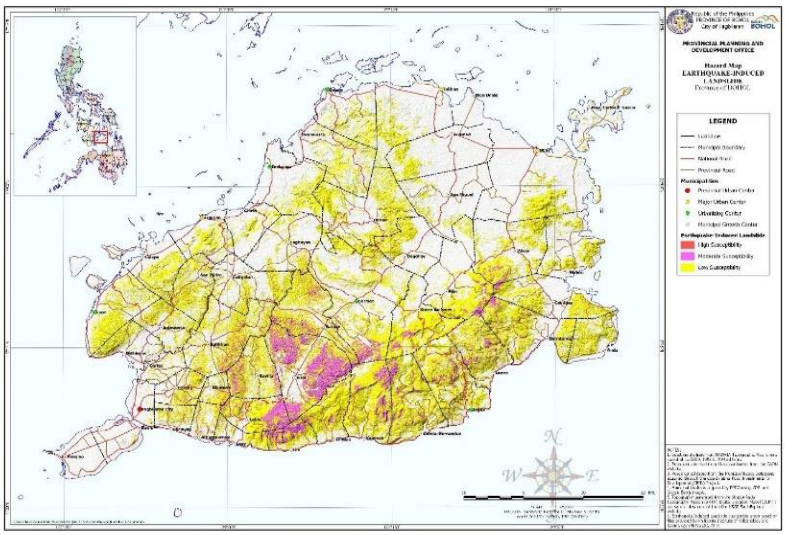
According to current data, all coastal municipalities and one (1) city, including island barangays of Bohol are highly susceptible to liquefaction. The municipalities of Ubay, Bien Unido, Panglao and Pres. Carlos P. Garcia are observed to be highly affected by liquefaction based on data and discussions. The moderately susceptible areas include some barangays located in the different municipalities of Ubay, Trinidad, San Miguel, Talibon, Candijay, Duero, Jetafe, Buenavista, Tubigon, Calape, Panglao, Dauis and Cortes. The coastal municipalities located in the southeastern, northeastern and northwestern portions of Bohol have more areas exposed to the liquefaction hazard compared to those situated in southern Bohol. Municipalities with low exceedance liquefaction are portions of Ubay, Alizia, Pilar, Dagohoy, Carmen, Batuan and Bilar. The worst scenario is when there is high excess liquefaction which would affect the Central Business District (CBD) and urban barangays of coastal municipalities (Bohol PDPFP, 2016-2028).

There are agricultural areas that at risk to liquefaction along coastal municipalities as well and these are located in the municipalities of Ubay, Pres. C.P. Garcia, Bien-Unido and Panglao.

- ***Earthquake-Induced Landslide***

Earthquake-Induced Landslides (EIL) are described by PHIVOLCS as the *down slope movement of rocks, solid, and other debris commonly triggered by strong shaking*. It causes erosion as well as burial and blockage of roads and rivers. Similar to rain-induced landslides (RIL), an earthquake-induced landslide could destroy houses and cause injury or death to residents living near sloped areas. It could likewise damage vegetative cover and croplands, as well as access roads to agri-tourism, commercial, residential, and other key built-up areas.

Map 14. Earthquake-Induced Landslide Hazard Map, Bohol Province



Source: ***PPDO Bohol***

The municipalities of Lila, Dimiao, Valencia, Loboc (man-forest), Bilar (east-side), Garcia-Hernandez, Sierra Bullones, Duero, Jagna, Sevilla, Loay, and Candijay are observed to be with the highest susceptibility based on current data and experience.

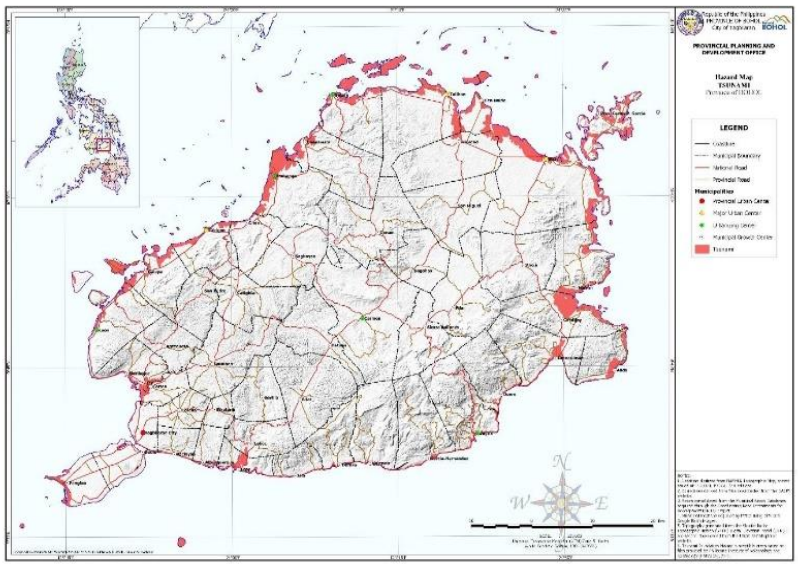
The agricultural areas, except fishery areas, at risk to EIL are in Dimiao, Loboc, Valencia, Sierra Bullones, Garcia-Hernandez, Guindulman, Jagna, Pilar, Alicia and Carmen. In relation to this, the municipalities such as Dimiao, Lila, and Loboc have agricultural land areas that are highly susceptible to EIL. Furthermore, the agricultural areas of Loon, Calape, Tubigon, Inabanga, Clarin, Buenavista, Valencia, Pilar, Bilar, Guindulman, Candijay, S. Bullones, Carmen are also at risk to EIL.

- ***Tsunami***

Tsunami refers to the *series of waves caused commonly by an earthquake under the sea*. It causes flooding, coastal erosion, drowning of people, and damage to properties.

According to current data, all coastal municipalities are highly susceptible to tsunami. The population, agriculture, including fisheries at risk to Tsunami are located in 30 coastal LGUs. Inundation of rivers caused by pressure from tsunami may affect the municipalities of Inabanga, Pres Carlos P. Garcia, Candijay, Loay, Loon, Anda, Maribojoc, Cortes, Duero and Loboc, hence they are considered as priority LGUs.

Map 15. Tsunami Hazard Map, Bohol Province

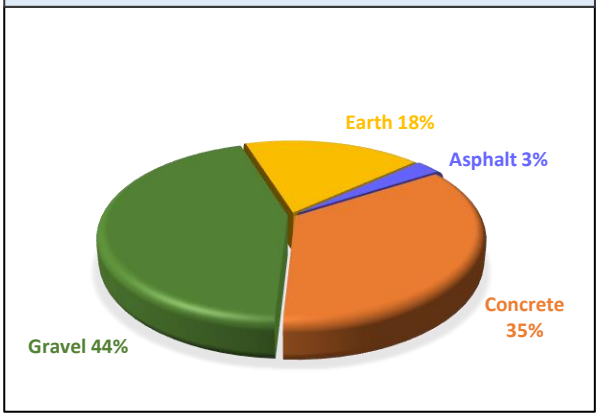


Source: ***PPDO Bohol***

Infrastructure [10]

In 2022, Bohol's **total road** length is 6,152.19 kilometers. Of these roads, 12% are classified as national roads and 14% provincial roads. The city roads only account for 1% while municipal roads 5%. Barangay roads have the longest stretch of roads, accounting for 68%. In terms of type of pavement, most of the province's roads are still gravel, which may be attributed to local roads. Concrete roads account for 35%, and continue to increase in length as both national and local governments sustain their projects for road concreting. Asphalt roads, on the other hand, shared 3% of the total road length. Meanwhile, 18% of the province roads remain to be earth roads, which are mostly classified as barangay roads.

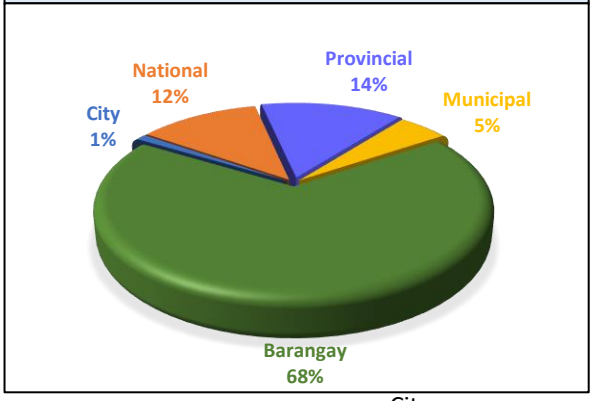
Figure 3. Type of Pavement, Province of Bohol, CY 2022



Source: ***Department of Public Works & Highways (DPWH)***

As to bridges, there are 8,419.64 linear meters of bridges within the road network in the province and 64% of this total length is composed of concrete. Steel bridges account for 27% while bailey bridges are 7%. There are still timber bridges in the province, which shared a total length of 2%.

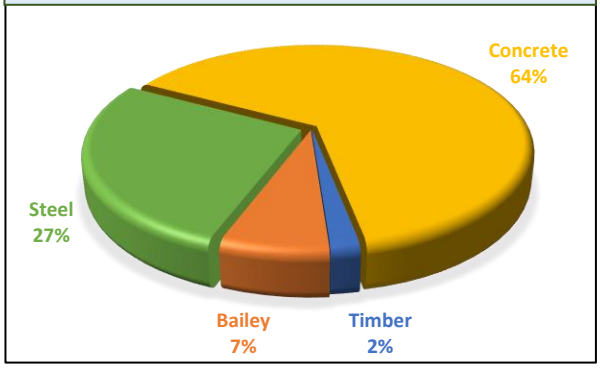
Figure 4. Road Classification, Province of Bohol, CY 2022



Source: ***Department of Public Works & Highways (DPWH)***

Majority of the bridges in the province are under the jurisdiction of the national government, which account for 61%. The Provincial Government is maintaining 1,509.00 linear meters or 18% of these bridges. The rest of the bridges are managed and maintained by the city/ municipal and barangay local governments.

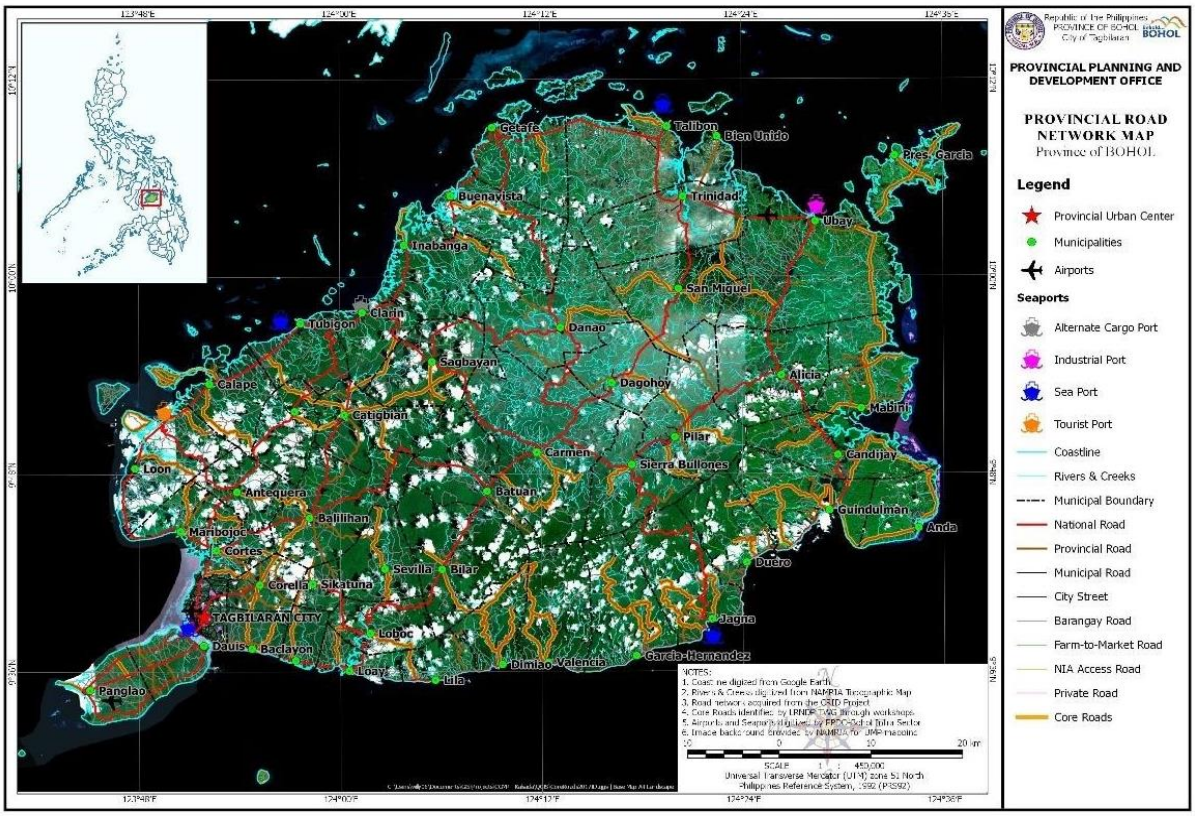
Figure 5. Bridge Classification, Province of Bohol, CY 2022



Source: ***Department of Public Works & Highways (DPWH)***

[10] Department of Public Works and Highways (DPWH)

Map 16. Road Network Map, Bohol Province



As to **seaport**, there are 16 ports in Bohol serving as the gateways of people and goods to and from the province. Of the 16 ports, there is only 1 baseport, located in Tagbilaran City. There are 4 terminal ports, 9 outports and 2 private ports located in several coastal municipalities. The Port of Tagbilaran is considered a major port of entry while the Port of Tubigon, the busiest among the terminal ports, offer more than ten daily round trips plying the Cebu-Bohol route. The Port of Jagna offers services that ply between Bohol to Cagayan, Nasipit and Camiguin with roll-on, roll-off route.

For **air travel**, the Province of Bohol is being served by two airports, namely, the Bohol-Panglao International Airport (BPIA) and the Ubay Airport which classified as a community airport with a runway of 1.2 km that serves as a feeder airport. Only the BPIA handles commercial flights and passenger traffic with direct flights to and from Manila and international flights. Number of flights to the province has been irregular for the past 6 years brought about by airline competition, level of demand for air travel, and changes in aviation regulations.

For **land transportation**, the road network in Bohol consists of circumferential road along the coastline and interior that connects the interior municipalities. The Tagbilaran Eastern Road (TER) connects Tagbilaran to Ubay via Jagna while the Tagbilaran Nothern Road (TNR) completes the loop from Ubay to Tagbilaran via the northern town of Tubigon. However, the province experienced the number of registered vehicles had a decreasing trend in 2018-2023 but increased slightly in 2021 to 2022. Before the COVID-19 pandemic in 2018, the number of vehicles registered in Bohol reached 124,744, yet this has decreased to 108,093 in 2023. Moreover, the preference for motorcycles stayed on top because of its affordability and lower maintenance cost compared to four-wheeled vehicles.

Socio Economic and Demographic Profile

Population

Based on the latest 2020 Census on Population, Bohol's population reached 1.394 Million, showing a 1.06% average annual increase from the 2010 population count. Such annual growth rate is lower than the Central Visayas' growth rate of 1.74%. Bohol's population growth, however, is lower than that of the 1.67% national annual growth rate. With this growth, estimated population of the province in 2024 is pegged at 1.398 Million and will further increase to 1.402 Million in 2025.

Among the 48 localities, Tagbilaran City has the highest population with 104,976, followed by municipalities of Ubay, Talibon, Dauis, Carmen, Inabanga, Tubigon, Loon, Panglao and Jagna. Sikatuna is the least populated municipality with only 6,906 population.

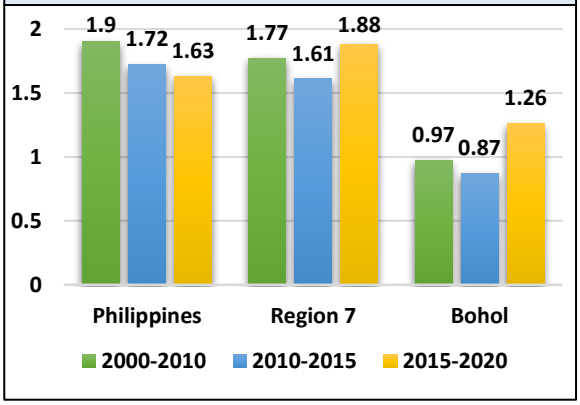
The population of Bohol has been fluctuating from 0.97% average annual increase (2000-2010) down to 0.87% (2010-2015) and bounced back to 1.26% (2015-2020).

The municipality of Panglao has the highest growth rate in the Province (3.37%). Among the top 10 localities with high growth rates include Dauis, Corella, Trinidad, Sagbayan, Getafe, Baclayon, Cortes, and Tubigon. The municipality of Dimiao has remained to have a negative population growth rate of -0.18% (2010-2020).

BASIC FACTS OF BOHOL PROVINCE

Population: 1.255 Million (2010)
1.313 Million (2015)
1.394 Million (2020)
Income Class: 1st Class Province
Land Area: 411,726 hectares (411.726 Km²)
Population Growth Rate: 1.06% (2010-2020)
No. of Household: 322,022 (2020)
Ave. HH Size: 4.3 (2020)
Pop. Density: 292 persons/km² (2020)
Administrative Units:
1 City, 47 Municipalities
1,109 Barangays
3 Congressional Districts
Coastline: 654 Km. of coastline
Municipal Waters: 6,245 Km²
Coastal Barangays: 304 Brgys.
No. of Islets: 72 islets

Figure 6. Average Annual Growth Rate: 2000-2020, Bohol



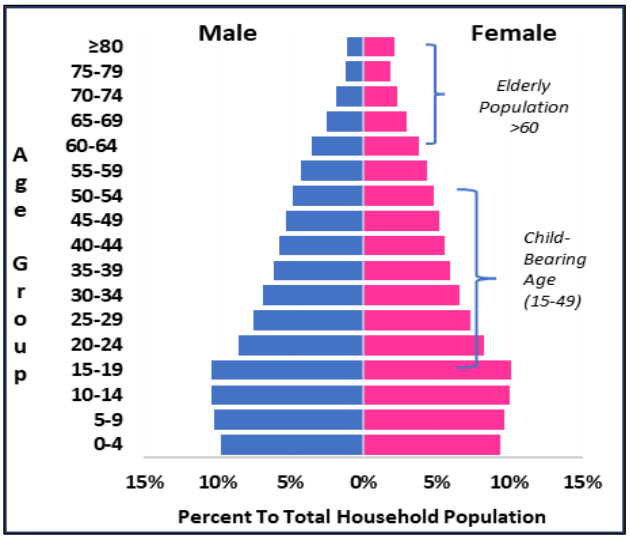
Source: OpenSTAT, Philippine Statistics Authority

Based on the 2020 Census, the population structure of Bohol shows bigger group of younger people (with 29.7% belonging to age group under 15 years old). Female reproductive Age (Child-bearing age) comprised 49.6%. Males outnumbered females in the 0-59 years old. Females outlived the males in the older age groups. Those aging 60 and over comprised 10% of Bohol's Population. From 24.5 in 2010, the median age for Boholanos rose to 25.7 years old for both sexes. This means that half of the total population was below 25.7 years old. For the female population, the median age was 26.3, higher by 2.4 years against their male counterpart. Moreover, 50.9 percent of the total population were males and 49.1 were females. This

translated to a sex ratio of 104 males for every 100 females. Among the municipalities, Buenavista had the highest sex ratio of 108 while Tagbilaran City had the lowest sex ratio of 98.

Bohol's population density is 292 persons per sq. km in 2020, which is higher compared to the 275 persons per sq. km in 2015. In 2010, the province's population density was only 263 persons per sq. km. Most of the densely populated areas in the province are found along the coast, concentrated along the north to northeastern part of Bohol. Among the top 10 most densely populated areas in the province include Tagbilaran City (2,876/km^2), Dauis (1,211/km^2), Bien Unido (974/km^2), Panglao (834/km^2), Cortes (671/km^2), Baclayon (652/km^2), Tubigon (585/km^2), Talibon (507/km^2), Maribojoc (449/km^2), and Calape (439/km^2). On the other hand, the least densely populated areas include Sevilla (97/km^2), Dimiao (110/km^2), Danao (124/km^2), Antequera (126/km^2), Sierra Bullones (131/km^2), Bilar (143/km^2), Balilihan (147/km^2), San Isidro (165/km^2), Trinidad (180/km^2) and Sikatuna (181/km^2).

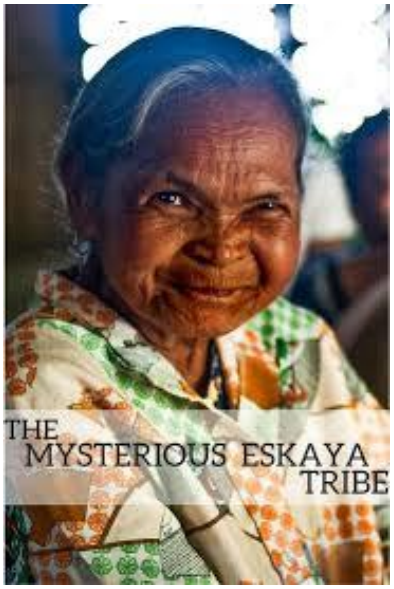
Figure 7. Age-Sex Pyramid of Household Population: 2020, Bohol



Source: ***OpenSTAT, Philippine Statistics Authority***

Bohol's Indigenous Peoples' (IP)

- **ESKAYA TRIBE**



The Eskaya is an indigenous tribe found in the hinterlands of the towns of Duero, Guindulman, Pilar and Sierra Bullones, in Bohol's southeast interior. They are a gentle community of about 4,000 people hardy peasants. Likewise known as the "Visayan-Eskaya", the community is only found in the island province of Bohol. They have a unique cultural heritage, use a distinct language and literature, and have traditional practices that dates way back to pre-Spanish times. The Eskaya people have their own language quite unlike the local Boholano or Cebu dialects, a system of writing, and an intrinsic written literature. While their whole week is devoted to tilling and communal forms, Sundays are set aside for Eskaya classes. Young and old alike learn the Eskaya ways in an attempt to relive and revive the almost forgotten Eskaya legacy.

The first settlement of this tribe is at Biabas, Guindulman, established in the early 20th century by one Mariano Datahan who died in 1949. A second settlement was established in Taytay, in the municipality of Duero in the year 1951 founded by Fabian Baja under Datahan's instructions. Eventually, the group spread to nearby Barangays of Canta-ub, Lundag, Tambongan, Cadapdapan and Abihilan.

The group was recognized and the community awarded a Certificate of Ancestral Domain Claim (CADC) in 1996 by President Fidel V. Ramos. CADC No. R7-CADC-14 was deemed as an ancestral domain consisting of 3,173 hectares of land in Taytay (Duero), Biabas (Guindulman), Lundag (Pilar), Canta-ub (Sierra-Bullones), and Cadapdapan (Candijay).

Legally, the Eskaya are now classified as an indigenous group under Republic Act No. 8371 entitled "The Indigenous People's Rights Act of 1997". No official census has yet been made of the group but a report in 1991 mentioned 130 Eskaya families living in Bohol.

- **ATI**

The Ati community in the Municipality of Loay, Bohol consists of about 200 people with an average family size of 5. Some of them settled along the shorelines of Loay, Bohol which is about 0.30 kilometers from the national highway. Their primary sources of income are fishing, hunting and selling herbal plants and medicines. Most head of families go fishing while mothers with their children sell herbal medicines.

The Atis are believed to have originally come from Panay Island. They are from the Negrito ethnic group in Panay, located in the Visayas Islands of Cebu, Bohol, Siquijor, Leyte, Samar, Masbate, Negros and Guimaras. They are genetically-related to other Negrito ethnic groups in the Philippines such as the Aeta of Luzon, the Batak of Palawan, and the Mamanwa of Mindanao.

- **BADJAO**

The Badjaos are an indigenous ethnic group of Malaysia and the southern Philippines. In Bohol, they are found largely in Brgy. Totolan, a coastal barangay at the northern part of Dauis, 1.5 kilometers away from the City. This cultural community migrated to this barangay during the tumultuous years in Mindanao in the 70's and have since then found a haven in the shorelines of said Municipality. Since then, this cultural group of Badjaos had established a community in said area.

The Badjaos are what are considered as sea gypsies. The Bajaos have been a nomadic, seafaring people, living off the sea by trading and subsistence fishing. They generally live in the sea using "bankas" as houses if not on stilt houses along the seashore. Their primary source of income is deep sea fishing. At present, there are 78 families in the community and a population of 545 people.

Poverty Situation

The reduction, if not the elimination of poverty continues to be a challenge in Bohol with a number of its families still considered as poor. Bohol's Poverty Incidence as well as its Subsistence Incidence[11] among families has been steadily decreasing since 2015 despite the pandemic in 2020. From 21.7 percent in 2015, poverty incidence among families lowered to 15.5 percent in 2018, which rose to 19.1 percent in 2021 post-COVID pandemic and eventually lowered to 14.8 percent in 2023.[11] In the same period, the proportion of Boholanos in extreme poverty whose incomes are not sufficient to meet basic food needs registered at 4.0 percent in 2023.

Furthermore, the Annual Per Capita Poverty Threshold of the province had been decreased from Php 26,853 in 2021 to Php 15,175 in 2023. The Annual Per Capita Food Threshold of Php 18,743 in 2021 to Php 10,602 in 2023. In terms of income gap in 2023, the measured amount of income required by the poor in order to uplift from poverty was estimated at 25.4% based on PSA preliminary results.

Table 3. Poverty Profile, Bohol Province
Annual Per Capita Poverty & Food Thresholds, Poverty & Subsistence Incidence & Magnitude of Poor Families & Other Poverty Indicators in Region 7 & Bohol Province, 2015, 2018, 2021 and 2023

Region/ Province	Annual Per Capita Poverty Threshold (in Pesos)				Poverty Incidence among Families (%)				Magnitude of Poor Families			
					Estimates (%)				Estimate ('000)			
	2015	2018	2021	2023	2015	2018	2021	2023	2015	2018	2021	2023
PHILIPPINES	21,753	25,814	28,794	33,296	16.5	12.1	13.2	10.9	3,747	3,005	3,482	2,992
Region VII	21,914	25,968	32,423	34,553	23.6	12.2	22	12.3	394	181	354	207
Bohol	20,437	26,108	26,853	30,981	21.7	15.5	19.1	14.8	60	47	61	49
Cebu	21,740	25,914	33,657	35,605	17.9	11.3	22.8	11.7	179	134	293	157
Region/ Province	Annual Per Capita Food Threshold (in Pesos)				Subsistence Incidence among Families (%)				Magnitude of Subsistence Poor Families			
					Estimates (%)				Estimate ('000)			
	2015	2018	2021	2023	2015	2018	2021	2023	2015	2018	2021	2023
PHILIPPINES	15,189	18,126	20,046	22,994	5.7	3.4	3.9	2.7	1,303.55	839.54	1,032.63	741.73
Region VII	15,357	18,033	22,679	24,049	9.8	2.6	8.1	3.2	164.50	38.24	130.18	53.42
Bohol[b/]	14,249	18,245	18,743	21,636	7.2	2.9	6.2	4	20.14	8.90	19.94	13.33
Cebu	15,139	17,959	23,400	24,798	6.8	2.5	8.6	3	68.35	29.34	110.25	40.09

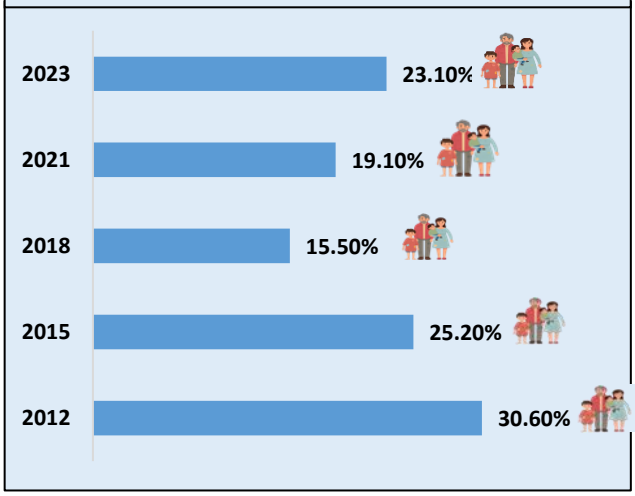
Region/Province	Income Gap				Poverty Gap				Severity of Poverty			
	2015	2018	2021	2023	2015	2018	2021	2023	2015	2018	2021	2023

[11] Families with income below the food threshold; subsistence incidence is often referred to as the proportion of Boholanos in extreme or subsistence poverty

Region/ Province	Annual Per Capita Poverty Threshold (in Pesos)				Poverty Incidence among Families (%)				Magnitude of Poor Families			
					Estimates (%)				Estimate ('000)			
	2015	2018	2021	2023	2015	2018	2021	2023	2015	2018	2021	2023
PHILIPPINES												
Region VII	27.9	19.2	25.8	20.53	6.6	2.34	5.69	2.52	2.6	0.72	2.15	0.81
Bohol	25.7	18.11	23.92	21.53	5.6	2.8	4.57	3.19	2.1	0.79	1.58	1.05
Cebu	26.3	19.58	26.19	20.21	4.7	2.22	5.97	2.36	1.8	0.7	2.29	0.75

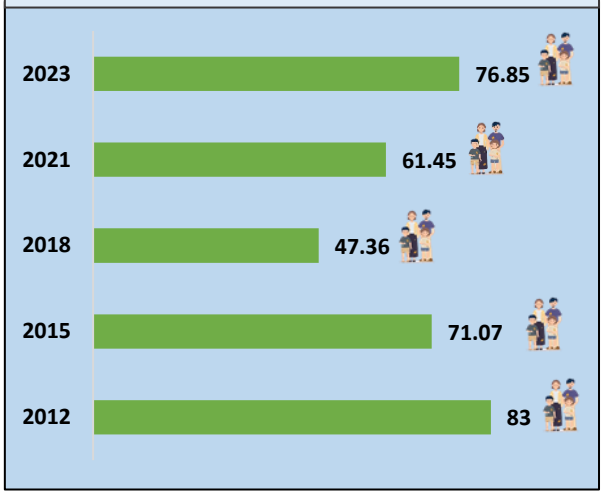
Bohol's poverty incidence among families reduced by 39% in 2018, however in 2021 the poverty incidence gradually increased until 2023, this may be caused by COVID-19 pandemic and Typhoon Odette that brought devastating effect to the province. From a low percentage in 2018 (15.50%) to increased percentage in 2023 (23.10%). In terms of magnitude of poor families, a total of 76,850 families were considered poor in 2023, which was higher compared to year 2018.

Figure 8. Poverty Incidence among Families (%)
Province of Bohol



Source: ***2023 Full Year Poverty Statistics, PSA***

Figure 9. Magnitude of Poor Families ('000)
Province of Bohol



Source: ***2023 Full Year Poverty Statistics, PSA***

Employment

In terms of employment in the Province, employment rate has improved over the past three years. Based on the Labor Force Survey of the Philippine Statistics Authority (PSA), employment rate in the year 2015 is pegged at 95.6%, which is higher to the 93.6% and 94.8% in the year 2013 and 2014, respectively. It can also be noted that the employment rate of Bohol is consistently higher compared to the national and regional averages for the three-year period.

Meanwhile, labor force participation rate of the Province has also increased during the same period, with 66.3% in 2015, higher than the 58.2 in 2013 and 60.2% in 2014.

Figure 10. Employment Rate: 2020-2022, Province of Bohol

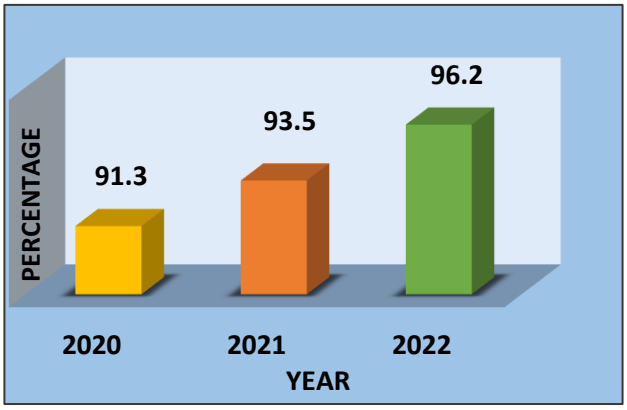
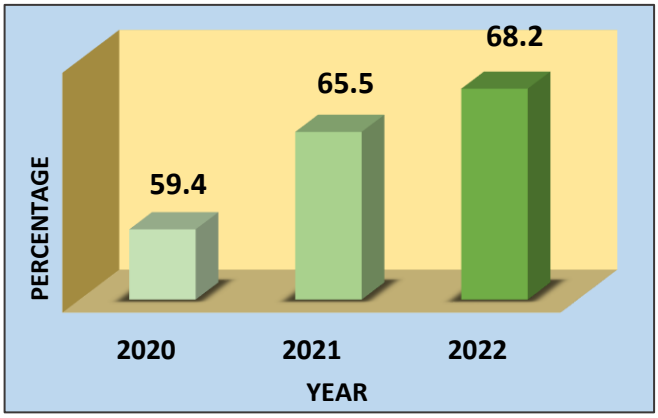


Figure 11. Labor Force Participation Rate: 2020-2022, Province of Bohol

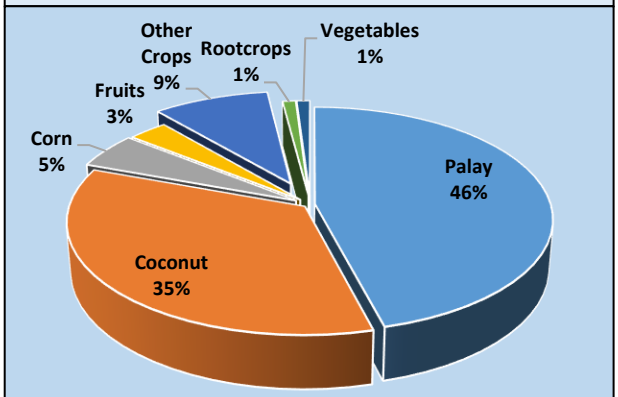


Source: ***OpenStat, Philippine Statistics Authority***

Economy and Priority Industries

The economy of Bohol is largely based on agricultural activities that focused on the cultivation of crops on its vast agricultural land. With this, home-based industries, which are mostly of the micro and cottage types, play a vital role in the economy. The government continues to provide support to sustain the development and production of major crops such as palay, corn, high value commercial crops, and fisheries through upland and marine aquaculture, organic agriculture and livestock. The development of dairy products is also being pursued in collaboration with appropriate government agencies and livestock farmer's groups. Support for this program would allow further value-adding processing of cow and carabao's milk, which in turn, will provide higher income for farmers.

Figure 12. Area Harvested to Major Crops, Bohol: 2023



Source: ***OpenStat, Philippine Statistics Authority***

Agriculture is the largest sector in terms of providing employment, as well as in land use. Of the total land area of the province, 273,950 ha (66%) are available and use for agriculture. Meanwhile, 149,598.74 hectares of this area is planted and harvested with major crops. Among the major crops in the area includes palay (47%), coconut (36%), corn (6%), fruits (4%), other crops (4%), root crops (2%) and vegetables (1%).

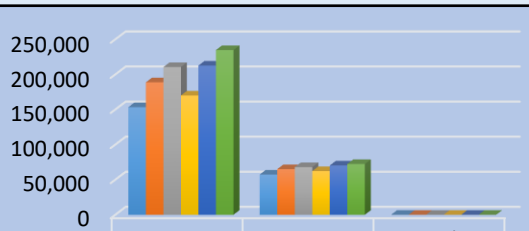
- **Crops Production**

Rice. A staple food for many Boholanos wherein producing locally ensures food security for the province. It is mainly produced by small farmers, with a total of 72,630 hectares area planted. The irrigated and rainfed rice area is approximately 41,738 and 30,892 hectares, respectively. The total palay production in 2024 was about 234,801.78 metric tons.

The province of Bohol remains to be rice sufficient with a sufficiency level of 90.34% and continued to hold its title as "Rice Basket "in Central Visayas. The volume of production and area planted with palay has been increasing from 2019 to 2024. This came as the rice harvest season in Bohol is mid-way and the Boholano farmers have registered high yield performance both in hybrid and inbred rice being planted in rain-fed and irrigated areas in the province.

At the regional setting, Central Visayas rice production is largely dependent on the Province of Bohol. In 2024, the province accounted 74% of the region's rice production, which is significantly higher compared to the production share of the other provinces.

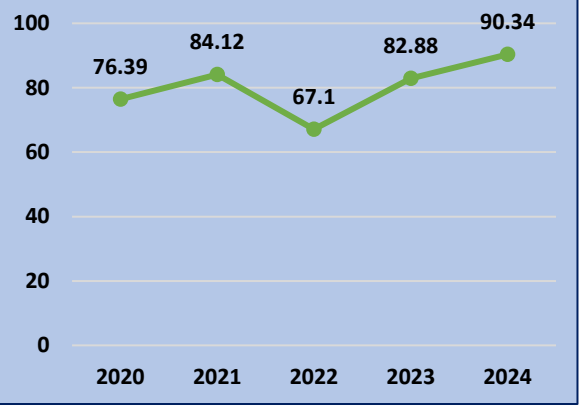
Figure 13. Palay Production, Bohol: 2018-2024



	Prod'n (mt)	Area	Yield/ha (mt/ha)
2019	153,405	57,400	2.67
2020	188,832.78	65,009	2.9
2021	210,584	67,907	3.1
2022	170,086.85	62,244	2.73
2023	212,718.61	70,278	3.03
2024	234,801.78	72,360	3.23

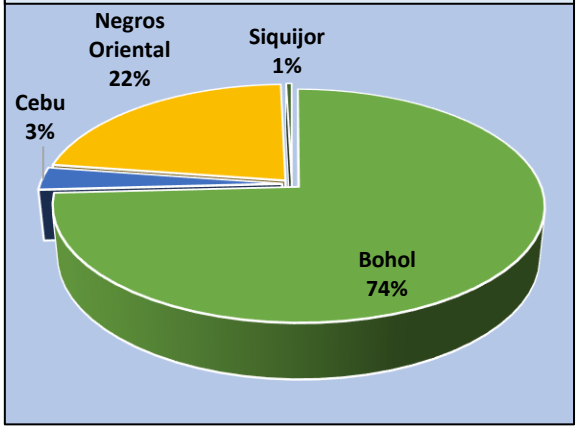
Source: ***OpenStat, Philippine Statistics Authority***

Figure 14. Rice Sufficiency, Bohol: 2020-2024



Source: ***Department of Agriculture Region VII***

Figure 15. Central Visayas Rice Production: 2024



Source: ***OpenStat, Philippine Statistics Authority***

Corn. A staple crop to many Boholanos next to rice. There are two varieties of corn produced in the province, white corn and yellow corn. The total area planted for corn was about 8,589 hectares, produced by local farmers. In 2024, area planted for white and yellow corn is approximately 6,905 and 1,684 ha., respectively. The total corn production in 2024 was about 11,340.75 metric tons.

Vegetables. There are two types of vegetables grown in the province, the leafy and fruit vegetables. The leafy vegetables include pechay, kangkong and green onions while the fruit vegetables are ampalaya, eggplant, okra, squash, string beans, tomato and ginger. Some lettuce, cabbage and chayote are commonly grown in the highland areas of Duero, Jagna, Sierra Bullones, Candijay and Guindulman. Eggplant has the most extensive area of 318 hectares and showed the highest volume of production of 1,626.84 metric tons in 2023.

Coconut. Coconut is a major commercial crop in Bohol. The towns with vast areas planted with coconuts are Balilihan, Antequera, Valencia, Garcia Hernandez, Ubay and Inabanga.

As of 2023, in terms of agricultural land usage with an approximate area of 53,585.45 hectares, of which 4,028,713 bearing trees. Furthermore, there were 89,322 coconut farmers registered in the National Coconut Farmers Registry System (NCFRS).

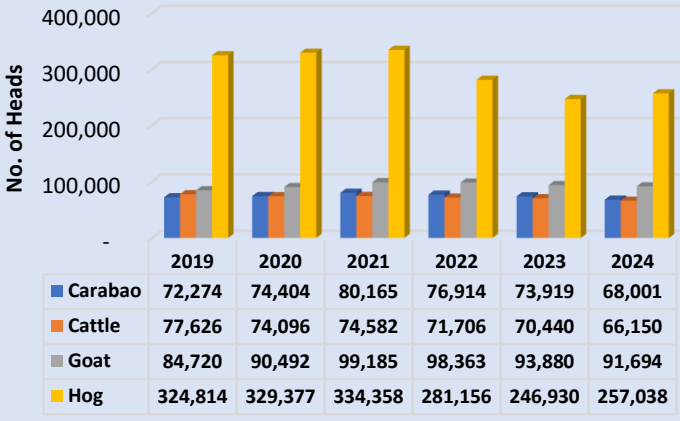
Rootcrops. In 2023, Bohol's major rootcrops posted a production of 18,974.35 metric tons. The decline in production was brought by the damaging effect of Typhoon Odette. Cassava remains to be the dominant crop with a total production of 9,456.60 metric tons. Camote and ubi produced 3,677.13 metric tons and 3,546.77 metric tons, respectively. Gabi, on the other hand, posted 2,293.85 metric tons. As of 2023, a total of 3,151.68 hectares of land have been harvested with major rootcrops.

Fruit Crops. As of 2023, the total area planted was 6,398.49 hectares with banana having the largest area covering 3,148.77 hectares, followed by mango with 2,215.68 hectares. PSA report shows an overall production of fruits in the province with an output of 19,867.53 metric tons where banana is the dominant fruit in the province in terms of production volume at about 15,498.36 metric tons compared to pineapple with a total production of 792.28 metric tons.

Livestock and Poultry Production

Bohol is self-sufficient in livestock and poultry such as swine, carabao, cattle, goat, chicken and duck. Bohol's livestock and poultry industry is a major contributor to the region's total production. In terms of **livestock inventory**, the livestock numbers have been gradually decreasing from year 2021 to 2024. Moreover, hog still remains to be the largest in number composing 53% of the entire livestock inventory of Bohol which accounted 257,038 heads in 2024, followed by goat (91,694 heads), carabao (73,919 heads), and cattle (66,150 heads). In addition, Bohol, being one of the top producers of hog, has remained to be free from African Swine Fever (ASF) and has tightened its borders from any possible entry of transboundary diseases including the Avian Influenza or bird flu.

Figure 16. Livestock Inventory, Bohol: 2019-2024



	2019	2020	2021	2022	2023	2024
Carabao	72,274	74,404	80,165	76,914	73,919	68,001
Cattle	77,626	74,096	74,582	71,706	70,440	66,150
Goat	84,720	90,492	99,185	98,363	93,880	91,694
Hog	324,814	329,377	334,358	281,156	246,930	257,038

Source: **OpenStat, Philippine Statistics Authority**

Carabao. As of 2024, carabao inventory reached to 68,001 heads, decreasing compared to previous years. The province plays a vital role in providing good quality carabaos for breeding, draft and meat for its neighboring provinces. In terms of production, Bohol had a total production at about 2,520.68 metric tons, as of 2024.

Cattle. The inventory of cattle in 2024 indicated 66,150 heads showing a downward trend from previous years. Based on the PSA data, Bohol ranks second to Cebu and accounted for 19.06% of the total 346,994 cattle in the region. Moreover, Bohol ranked third in terms of volume of production in the entire region at about 3,755.06 metric tons, as of 2024.

Goat. The production of goat in the province showed 589.52 metric tons, as of 2024. In terms of goat inventory, Bohol ranked third which had 91,694 heads, accounted 14.94% of the total 613,628 goat in the region, as of 2024.

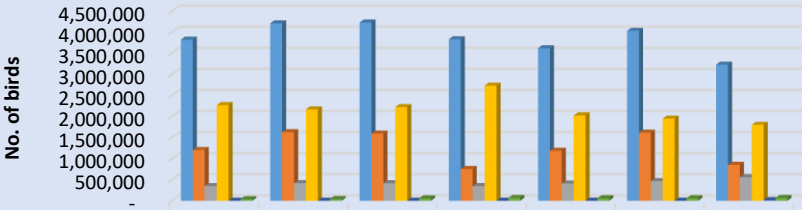
Hog. Hog population of the province as of 2024 is recorded at 257,038 heads (PSA), where 165,604 heads on smallhold farming, 89,778 heads on commercial farming and 1,656 heads on semi-commercial farms. In region 7, Bohol ranks third contributing 27.45% of the regional total population of 936,452 heads as of 2024. The Province of Bohol still remained free from African Swine Fever (ASF) which helped sustained the production of hogs. In terms of production, Bohol showed 46,939.90 metric tons in 2024 which ranked third of the total 218,202.62 metric tons production of the region.

The operation of government-operated artificial breeding centers for swine in the municipalities and in some private farms and the mobile boar for hire services, has contributed to the upgrading of existing stocks. On the other hand, native pig production is becoming popular on a "back to basics" husbandry with starter breeders distributed through dispersal projects.

On the other hand, **poultry inventory** in the province showed irregular trends from 2020 to 2024. Bohol poultry inventory in 2024 accounted for more than 3 million birds that are predominantly composed of chicken.

Chicken. The chicken population in the province include broiler, layer and native or improved. As of 2024, Chicken remains as the top poultry commodity of Bohol with 3,227,974 heads, much lower than 2023 inventory that accounted 4,029,559 heads. Out of these inventories, 56% is attributed from native chicken production, followed by broiler with 56%, layer with 17% and gamefowl which accounted for 0.5%. In terms of production, Bohol produced 36,644.20 metric tons of chicken, as of 2024.

Figure 17. Poultry Inventory, Bohol: 2018-2024



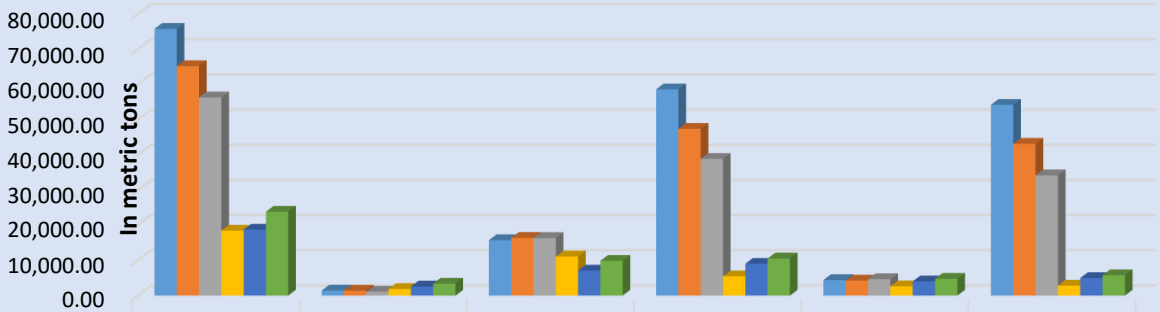
	2018	2019	2020	2021	2022	2023	2024
Chicken	3,820,306	4,207,970	4,228,731	3,830,427	3,616,454	4,029,559	3,227,974
Broiler	1,203,280	1,625,000	1,593,532	753,664	1,184,987	1,614,855	851,799
Layer	348,035	416,642	413,885	346,611	407,910	466,236	560,332
Native	2,268,991	2,166,328	2,221,314	2,730,152	2,023,557	1,948,508	1,800,371
Gamefowl	-	-	-	-	-	-	15,472
Duck	37,464	38,770	57,225	66,633	59,011	58,881	65,730

Source: ***OpenStat, Philippine Statistics Authority***

Fisheries Production

In terms of **fisheries production**, aquaculture still remains to be the highest contributor to the volume of fishery production in the province. In 2024, aquaculture posted 44.3% share in the total volume of fishery production where the 24.22% came from seaweed production and 20.09 percent contributed from brackishwater/freshwater production, followed by municipal fisheries accounting 41.45%, next was the commercial fisheries which accounted 14.24%.

Figure 18. Fisheries Volume of Production, Bohol: 2018-2024

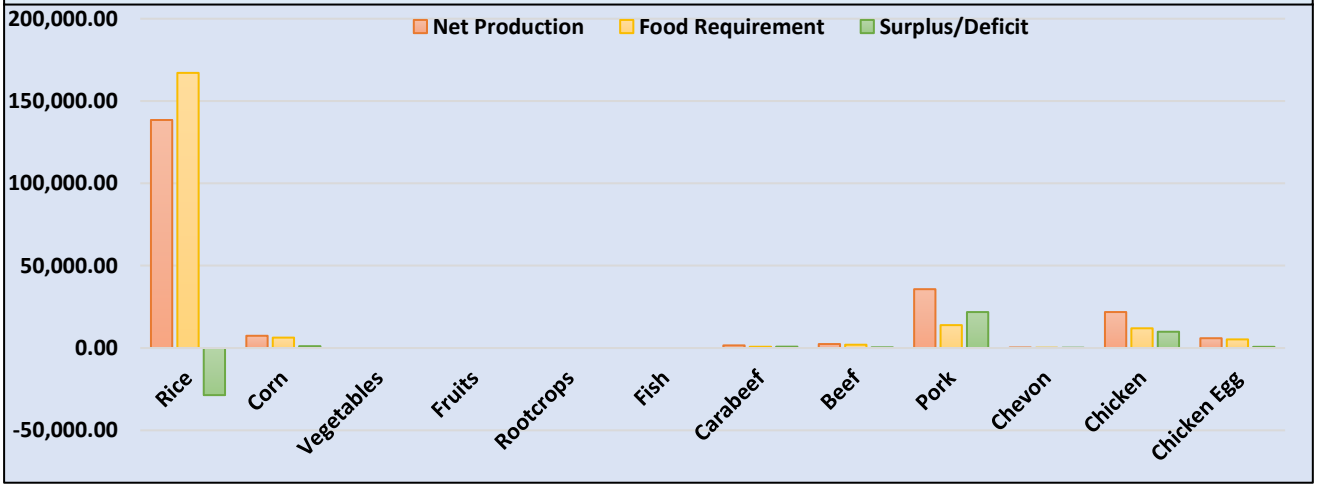


	TOTAL	Commercial Fisheries	Municipal Fisheries	Aquaculture	*Brackishwater /Freshwater	*Seaweed
2019	75,818.35	1,443.37	15,751.12	58,623.86	4,419.53	54,204.33
2020	65,215.31	1,387.20	16,421.72	47,406.39	4,265.20	43,141.19
2021	56,316.82	1,115.83	16,359.99	38,841.00	4,663.95	34,177.05
2022	18,473.61	1,886.55	11,116.90	5,470.16	2,624.42	2,845.74
2023	18,732.54	2,581.84	7,118.09	9,032.60	4,035.05	4,997.55
2024	23,820.82	3,393.07	9,872.85	10,554.90	4,785.81	5,769.09

Source: ***OpenStat, Philippine Statistics Authority***

Comparing the production and consumption of major food commodities, the province of Bohol has surplus production for corn, rootcrops, carabeef, beef, pork chevon, chicken and eggs. Food commodities where the province have recorded deficit in terms of production include rice, vegetables, fruits and fish.

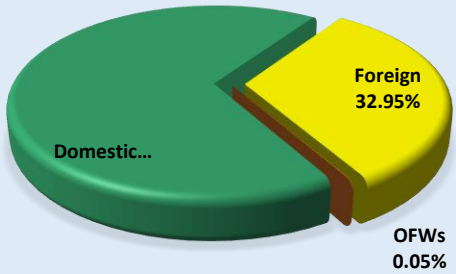
Figure 19. Production and Consumption of Major Commodities, Bohol: 2023



Source: ***OpenStat, Philippine Statistics Authority***

Tourism is another industry, which is sustained by both the private sector and government. The tourism industry further boomed after the province was designated as Bohol Island UNESCO Global Geopark in 2023 - the only one in the Philippines and largest in Asia. In 2023, the tourist arrivals increased by 89 percent compared to 2022. Domestic visitors hold the majority share of the total arrivals accounted 68 percent in 2023. Meanwhile, foreign visitors shared 32.95 percent and OFW's with 0.05 percent in 2023.

Figure 20. Bohol Tourist Arrivals, 2023



Source: ***Department of Tourism Region 7 and Bohol Provincial Tourism Office***

Figure 21. Visitor Arrivals, Bohol: 2019-2023

	Domestic	Foreign	OFW's	TOTAL
2019	854,853	720,364	6,687	1,581,904
2020	109,237	68,104	0	177,341
2021	178,654	1,127	0	179,781
2022	503,368	32,310	125	535,803
2023	686,875	325,499	480	1,012,854

Source: ***Department of Tourism Region 7) and Bohol Provincial Tourism Office***

Table 4. Top 10 Foreign Tourist Travelers, Bohol: 2023

	Korea	41.90%
	China	9.98%
	Taiwan	7.82%
	USA	5.98%
	Germany	2.72%
	France	2.64%
	Japan	2.64%
	Hongkong	2.02%
	Canada	2.00%
	United Kingdom	1.62%
	Others	20.70%

Source: ***DOT 7 and BPTO***

In terms of foreign visitors in the province for 2023, Koreans dominated the tourism market, sharing 41.90%. It is followed by Chinese with 9.98% share, Taiwan (7.82%), USA (5.98%), Germany (2.72%), France and Japan (2.64%), Hongkong (2.02%), and United Kingdom (1.62%).

In terms of regional scale, as of 2023 Bohol accounted 18% of the total visitor arrivals in Central Visayas. Meanwhile, Cebu as the major gateway and hub in the region accounted a significant share of 74%.

Local and foreign industry players continue to pour in investments in this sector considering the consistent and stable growth of the tourism industry in the province and bright outlook of the industry prospects. Improvement of infrastructure and support facilities in the province has also enticed larger investments through the years. In terms of accommodation facilities, the number of available rooms increased by 20% from year 2019 to 2023.

Source: ***Department of Tourism Region 7 (DOT 7) and Bohol Provincial Tourism Office (BPTO)***

Bohol opened its doors to entice more investments into the province. Investment areas in the province are focused on eco-tourism, light industries and agro-industrial development. Recently, two major investors are opening up in Bohol, namely, the **SM Supermalls**, the country's largest retail mall (in the city) and the **JW Marriot Panglao Resort and Spa** (Marriot remains the world's largest hotel chain in terms of the number of rooms globally) located in Panglao - among many other resorts and hotels. Another promising industry in Bohol is the Information and Communications Technology, particularly for business process and knowledge process management outsourcing. In 2019, two major BPO companies **(TaskUS and iBex.)** had been established in the province which are currently employing around 5,000 with 85% being Boholanos. This sector has a potential in contributing to the economic growth of the province. Furthermore, with the improvement of information and communications technology highway, following the installation of fiber optic technology in Bohol by private telecommunication firms, the province may soon provide significant employment opportunities to its capable workforce for such related services.

Additionally, in terms of **trade, investments and livelihood**, an estimate of more than Php 1 billion worth of investments were poured in the province for new hotels, resorts and malls. Furthermore, the Bohol Economic Development and Promotion Office reported a total of Php 29.3 billiion new investments in 2023.

The **micro, small, and medium enterprises (MSMEs)** in the province has an important role in the province local economy, stimulating economic activities even in rural and far-flung areas. However, MSMEs sector had shown irregularities over the period, with yearly increases and decreases observed. Additionally, number of business name registered decreased from 9,344 in 2022 down to 7,763 registered business names in 2023. The employment generated from MSMEs also decreased

from 34,473 in 2022 to 6,640 in year 2023. Meanwhile, the investment generated was Php 1,163,731,619.85 in year 2023.

Table 5. Micro Small Medium Enterprises (MSMEs) Business Name Registration and Employment Generated, Province of Bohol, 2019-2023

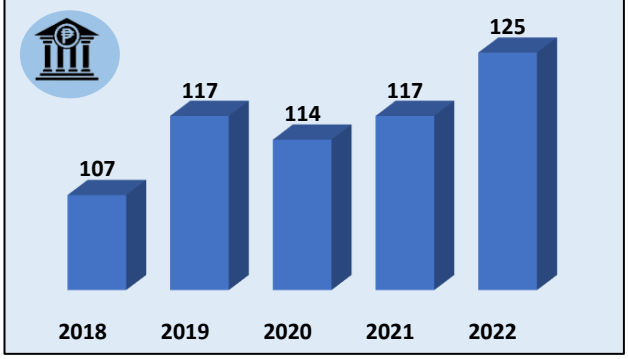
Year	BN Registrations			Employment Generated			Buisness Owners			Investments Generated
	New	Renewal	Total	Male	Female	Total	Male	Female	Total	(in million pesos)
2019	7,280	1,049	8,329	3,560	2,757	6,317	3,120	5,209	8,329	994,419,278.00
2020	7,595	1,007	8,602	11,645	11,336	22,981	3,225	5,377	8,602	10,866,297,832.33
2021	7,264	1,135	8,399	6,868	26,781	33,649	3,322	5,077	8,399	1,725,935,647.38
2022	7,859	1,485	9,344	7,472	27,001	34,473	3,631	5,713	9,344	11,795,279,732.17
2023	6,166	1,597	7,763	3,261	3,379	6,640	3,129	4,634	7,763	1,163,731,619.88
Total	**36,164**	**6,273**	**42,437**	**32,806**	**71,254**	**104,060**	**16,427**	**26,010**	**42,437**	**26,545,664,109.76**

Source: ***Department of Trade and Industry- Bohol***

Moreover, the operation of cooperatives in the province is also thriving to provide socio-economic benefits to its member. As of 2023, there are 701 Registered Cooperatives in Bohol. Of the total cooperatives registered, only 191 cooperatives are operating and compliant to CDA requirements, operating with a total asset of Php 6,196,761,233.58 and with a total membership reaching to 158,798.

The banking sector of the province had been growing with an increasing number of banks established in Bohol. As of 2022, there were 125 banks established in the province where 8 banks were added from the 117 banks in year 2021. In terms of total number of accounts, it also rose from 724,999 in 2018 to 857,454 in 2022. Additionally, total bank deposits grew from 50,934,448 in 2018 to 69,329,749 in 2022.

Figure 23. Number of Banks, Bohol, 2018-2022



Source: ***Philippine Deposit Insurance Corp. (PDIC)***

Figure 24. Amount Deposit (in Php), Bohol

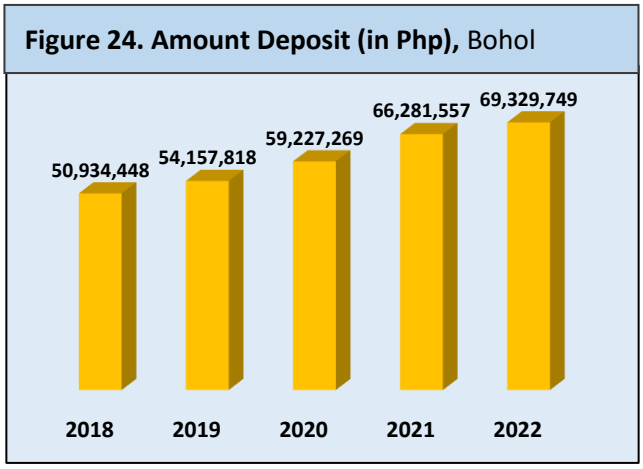
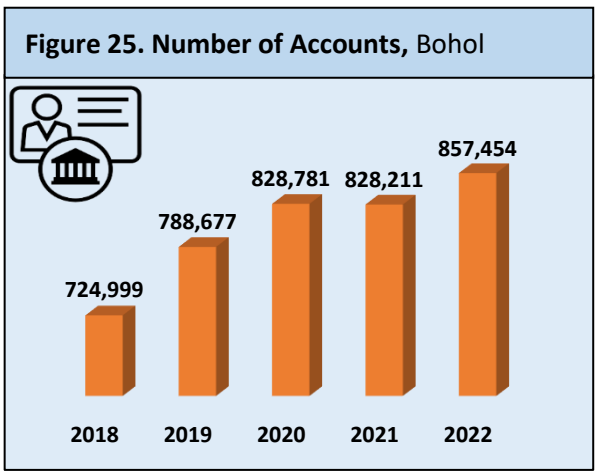


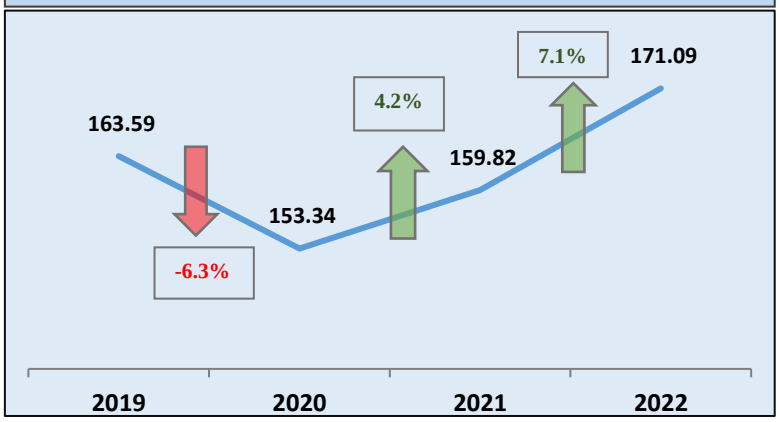
Figure 25. Number of Accounts, Bohol



Source: ***Philippine Deposit Insurance Corp. (PDIC)***

In terms of **Gross Domestic Product (GDP)**, the Province of Bohol posted a growth of 7.05% in 2022 estimated at Php 171.09 billion, higher than the 4.3% growth rate registered in the previous year. Bohol Province represents the third largest economy in the Central Visayas region following Cebu Province and Cebu City.

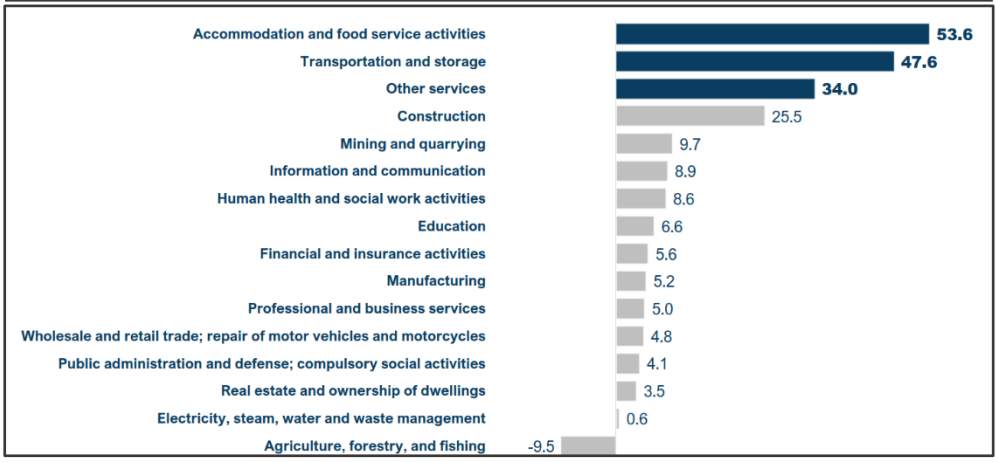
Figure 26. Annual GDP of Bohol, 2020-2023 Level (in Billion Php) and Growth Rates (in Percent), at Constant 2018 Prices



Source: ***OpenStat, Philippine Statistics Authority (PSA)***

In 2022, all industries in the province grew except for Agriculture, forestry, and fishing which declined by 9.5%. In terms of share of the major industries to the economy of the province, wholesale and retail trade, and repair of motor vehicles and motorcycles had the largest share, accounting 33.1%, followed by, Agriculture, forestry and fishing with a share of 11.7%, then, closely followed by financial and insurance activities at 8.8%.

Figure 27. Growth Rates by Industry (in Percent), 2022, Bohol Province, at Constant 2018 Prices



Source: ***Philippine Statistics Authority (PSA)***

Chapter II: Development Vision and Framework of the Province

Over-all Vision Statement and Development Goals

The Province of Bohol's development has been guided by its vision and mission statements. These statements, which have been crafted through consultative and participatory processes with practically all stakeholders and sectors represented, continue to serve as the overall guiding beacon of what Bohol wants to be, summarizing the aspiration of its people and the foundation of government's continued efforts of providing services, facilities and overall governance of the province.

The vision and mission statements, for several provincial administrations, have been adopted and revalidated to ensure that the province's goals, strategies and programs are aligned with such long-term development state. Below are the vision and mission statement of the Province of Bohol.

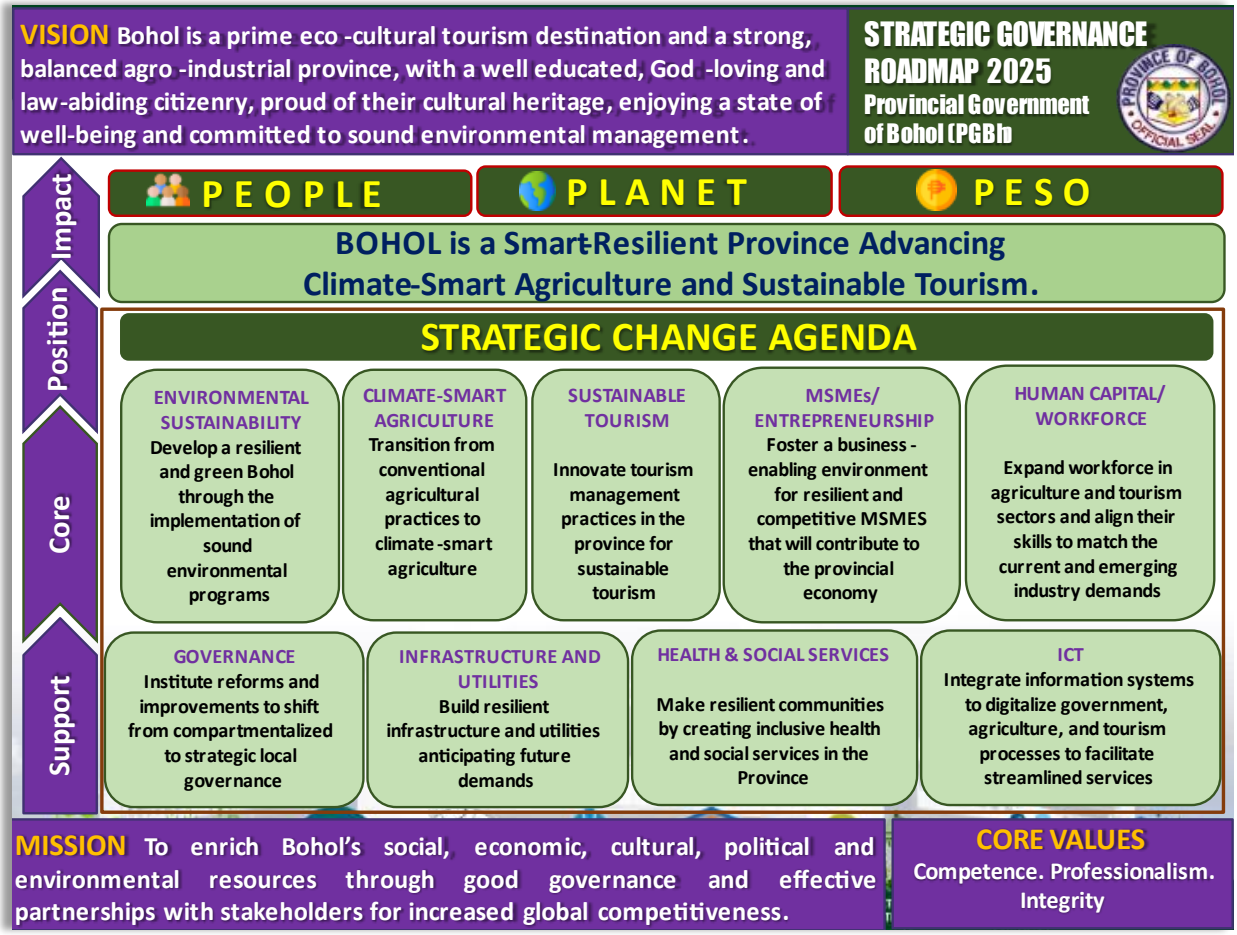
Vision	**Bohol is a prime eco-cultural tourism destination and a strong, balanced agri-industrial province, with a well-educated, God-loving and law-abiding citizenry, proud of their cultural heritage, enjoying a state of well-being and committed to sound environmental management.**
Mission	**To enrich Bohol's social, economic, cultural, political and environmental resources through good governance and effective partnerships with stakeholders for increased global competitiveness.**

To effectively achieve this vision, the Provincial Government of Bohol (PGBh) has periodically updated its Development Framework, which basically covers the medium-term (term-based) development priorities for the next three years. Such priorities are attuned to current realities and situation, to make government-led interventions as pro-active as possible to address issues and concerns of all sectors.

Recognizing the important role of planning in governance, the Provincial Governor, Vice Governor, members of the Sangguniang Panlalawigan and the members of the Management Executive Board (MEB) crafted a roadmap, which specify the priority strategies that will serve as its Agenda in next three years. The Strategic Governance Roadmap 2025 of the Provincial Government of Bohol (PGBh) aims to position Bohol as a "Smart-Resilient Province advancing Climate-Smart Agriculture and Sustainable Tourism." It still identifies the two economic drivers of agriculture and tourism as the primary industries that will bring the progress of its constituents and bring back the normalization of the economic and social activities that were greatly affected by the COVID-19 pandemic.

Strategic Governance Roadmap of the Provincial Government of Bohol (PGBh)

While supporting the existing Vision and Mission for the Province of Bohol, the Roadmap establishes to position Bohol as a Smart-Resilient Province advancing Climate-Smart Agriculture and Sustainable Tourism. It means that information and communication technology will be utilized to support the further progress of the two economic drivers of agriculture and tourism and the processes of governance for the welfare of the public. The roadmap, likewise, contains the Strategic Change Agenda and the Core Values that are expected from each employee of the PGBh.



Contained in the roadmap are nine (9) Strategic Change Agenda that are envisioned to provide the impetus for accelerating the necessary development of Bohol, which will benefit the majority of the Bol-anons.

- ***Strategic Change Agenda Mind Maps***

The means to achieve this position is through the Strategic Change Agenda, which are divided into the 5 Core of *Sustainable Environment*, *Climate-smart Agriculture*, *Sustainable Tourism*, *MSMEs/Entrepreneurship*, *Human Capital/Workforce* and the 4 Support of *Governance*, *Infrastructure and Utilities*, *Health and Social Services* and *Information and Communication Technology (ICT)*. Each of the Change Agendum is contextualized in a Mind Map that shows the Objective, Measures, and the Key Results Areas (KRAs).

Divided into five (5) Core and four (4) Support, each Agendum aims to transition governance with each respective objective:

a) Develop a resilient and green Bohol through the implementation of sound environmental program for *Environmental Sustainability*;
b) Transition from conventional agricultural practices to *Climate-smart Agriculture*;
c) Innovate tourism management practices in the province for *Sustainable Tourism*;
d) Foster a business-enabling environment for resilient and competitive MSMEs that will contribute to the provincial economy for *MSMEs/Entrepreneurship*;
e) Expand workforce in agriculture and tourism sectors and align their skills to match the current and emerging industry demands for *Human Capital/Workforce*;
f) Institute reforms and improvements to shift from compartmentalized to strategic local *Governance*;
g) Build resilient *Infrastructure and Utilities* anticipating future demands;
h) Make resilient communities by creating an inclusive *Health and Social Services* in the province; and
i) Integrate information systems to digitalize government, agriculture, and tourism processes to streamlined services for the *Information and Communication Technology*.

- ***Deliverables for the Planning Period***

A presentation of the deliverables for each year of the planning period is presented after each Mind Map. Each table contains the proposed programs, projects and activities (PPAs) that will support each Key Result Areas (KRA). The targets will be the measure upon which assessment will be made to know the status of its accomplishment.

- ***Core Values***

The Roadmap also contains the Core Values of Competence, Professionalism and Integrity, which each officer or employee of the PGBh is expected to adhere and put at heart.

Agriculture Sector Vision and Goals

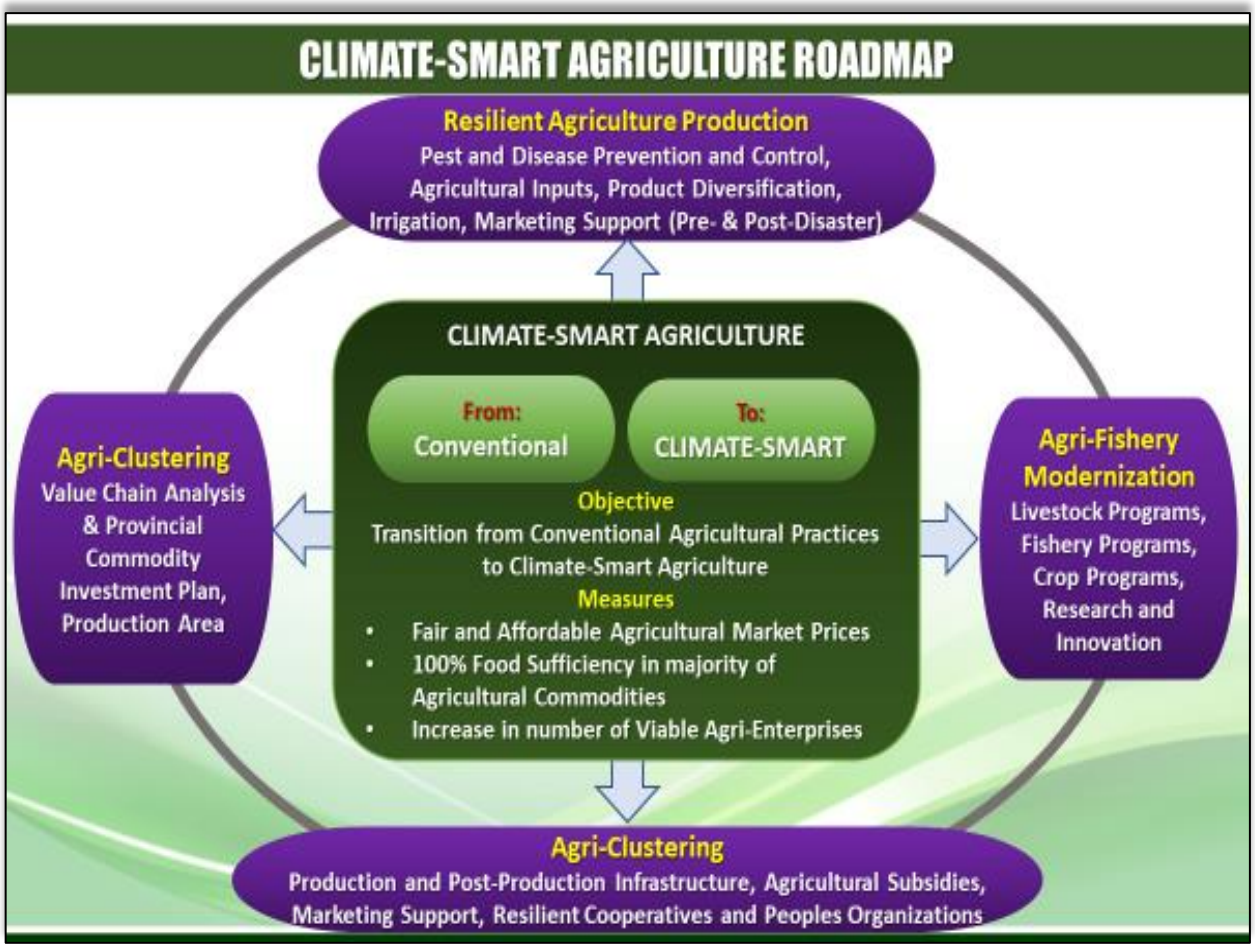
Agriculture is one of the economic drivers of Bohol and is the main source of livelihood of majority of the Boholanos. It provides income and livelihood to farmers and fisher folks and their dependents. Agriculture also enables traders, processors, retailers, and other groups to, directly or indirectly, make a living. Given these facts, it is only logical that the agriculture sector needs to be fully harnessed to enhance agricultural productivity and improve the incomes and welfare of farmers and fisherfolks.

Consistent with this drive and with consciousness that agriculture is an economic driver of Bohol, the Provincial Government has been steadfast in implementing agri-based support programs and projects to achieve food sufficiency and attain economic growth through agri- industrialization. The province is fortunate to be selected as a one of the sites of the Philippine Rural Development Project (PRDP) that aims to develop an inclusive, market- oriented, climate-resilient agri-fishery sector by strategically investing in priority value chains. Based on suitability, market potential, impact on the

poor and number of growers/ producers, identified provincial priority commodities that go through prioritization are the following: coconut, dairy, native chicken, swine, high-value vegetables, cassava, inland fishery, mariculture, cacao and coffee.

The Provincial Government also desires to develop its high-value crops, vegetables, banana, mango, coconut and other economically beneficial crops like palm oil and cassava. Fishery development in the province is also being prioritized, considering that Bohol is a major source of fishery products in Region VII. As to livestock and poultry development, the Provincial Government has been continually responsible in improving and safeguarding the said industries with the promotion of native chicken and the research on the development of a Boholano strain of native chicken.

Much attention has been focused in the agriculture sector, Bohol being predominantly agricultural with more than half of its total land area devoted to agriculture. The development effort of the province is guided by its vision for a Green Bohol, a Competitive and Sustainable Agro-industrial Province in the Visayas. The figure below presents the mind map of the agriculture sector with the overall goal for a Climate-Smart Agriculture aiming for a transition from Conventional Agriculture to Climate-Smart Agriculture through resilient agriculture production, agri-fishery modernization and agri-clustering.



Chapter III: Priority Commodity Chains Development

The priority commodities identified in the province are: coconut, livestock-dairy, native chicken, vegetable, cassava, inland fishery, swine, mariculture (seaweeds), cacao and coffee The identified commodities were ranked using the criteria as to suitability, market potential, impact on the poor and as to the number of growers or producers.

Table 6. Priority Commodities, Bohol, 2015

Commodity Prioritization Worksheet (CRITERIA)	Weight		Priority Commodities					
			COCONUT		LIVESTOCK-DAIRY		NATIVE CHICKEN	
			Raw Score	Weighted Score	0	Weighted Score	Raw Score	Weighted Score
I. Suitability	**20%**			**0.00**	0	**0.00**	0	**0.00**
II. Market Potential	**30%**			**2.70**		**2.70**		**2.34**
1. Market size		*20%*	9	1.80	9	1.80	9	1.80
3. Market growth potential		*20%*	9	1.80	9	1.80	9	1.80
4. Ease of entry		*20%*	9	1.80	9	1.80	6	1.80
5. Potential for value addition		*40%*	9	3.60	9	3.60	7	2.40
III. Impact on the Poor	**20%**			**1.80**		**1.80**		**1.80**
1. Number of Poor People Involved		*50%*	9	4.50	9	4.50	7	4.50
2. Potential to Raise/Create Income		*50%*	9	4.50	9	4.50	6	4.50
IV. Number of Growers/ Producers	**30%**		9	**2.70**	6	**1.80**	3	**1.80**
Total Weighted Score	**100%**			**7.20**		**6.30**		**5.94**
RANK				**1st**		**2nd**		**3rd**

Criteria	Weight		Priority Commodities					
			HI-HV VEGETABLE		CASSAVA		TILAPIA-HITO -IF	
			Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
I. Suitability	**20%**		0	**0.00**	0	**0.00**	0	**0.00**
II. Market Potential	**30%**			**1.98**		**2.34**		**1.62**
1. Market size		*20%*	9	1.80	9	1.80	6	1.20
3. Market growth potential		*20%*	9	1.80	9	1.80	6	1.20
4. Ease of entry		*20%*	9	1.80	9	1.80	9	1.80
5. Potential for value addition		*40%*	3	1.20	6	2.40	3	1.20
III. Impact on the Poor	**20%**			**0.90**		**1.80**		**0.60**
1. Number of Poor People Involved		*50%*	3	1.50	9	4.50	3	1.50
2. Potential to Raise/Create Income		*50%*	6	3.00	9	4.50	3	1.50
IV. Number of Growers/Producers	**30%**		6	**1.80**	6	**1.80**	3	**0.90**
Total Weighted Score	**100**			**4.68**		**5.94**		**3.12**
RANK				**4th**		**5th**		**6th**

Criteria	Weight		Priority Commodities							
			SWINE		MARICULTURE		CACAO		COFFEE	
			Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score	Raw Score	Weighted Score
I. Suitability	**20%**		0	**0.00**		**0.00**		**0.00**		**0.00**
II. Market Potential	**30%**			**2.52**		**1.50**		**1.50**		**1.50**
1. Market size		*20%*	9	1.80	6	1.20	6	1.20	6	1.20
3. Market growth potential		*20%*	9	1.80	6	1.20	6	1.20	6	1.20
4. Ease of entry		*20%*	6	1.20	7	1.40	7	1.40	7	1.40
5. Potential for value addition		*40%*	9	3.60	3	1.20	3	1.20	3	1.20
III. Impact on the Poor	**20%**			**0.60**		**0.90**		**0.80**		**0.50**
1. Number of Poor People Involved		*50%*	3	1.50	3	1.50	2	1.00	2	1.00
2. Potential to Raise/Create Income		*50%*	3	1.50	6	3.00	6	3.00	3	1.50
IV. Number of Growers/Producers	**30%**		6	**1.80**	2	**0.60**	2	**0.60**	2	**0.60**
Total Weighted Score	**100%**			**4.92**		**3.00**		**2.90**		**2.60**
RANK				**7th**		**8th**		**9th**		**10th**

Commodity Value Chain 3: BUFFALO DAIRY[12]

Commodity Profile

- **Product Description**

Buffalo are large members of the Bovidae family. There are two types of buffalo; the African or Cape buffalo and the Asian or water buffalo. In the Philippines, the buffalos in the country are under the Water Buffalo type and locally called as Carabao. The water buffalos are the largest bovine which includes yak, bison, zebu, wild cattles and others.

The water buffalos have been domesticated by humans for more than 5,000 years. Humans use the meat, milk, leather (hide) and horns of water buffalos. According to Encyclopedia Britanica it is the "living tractor of the East". As cited in Buffalo Bulletin (Nov 2013) by Wanapat, M and Kang, S, buffalos are long-time ruminant animals contributing to the integrated farming systems as a source of draft power, transportation, on-farm manure, meat, milk and livelihood of the farmers. Buffalos are usually raised by rural farmers and are well-adapted by the harsh environment. Buffalos are also capable of utilizing low quality roughages especially agricultural crop-residues and by-products hence their potential are remarkable in the meat and milk production using locally available feed resources.

There are two types of water buffalos, the swamp type and river type. The swamp water buffalos are mainly found in Southeast Asia. They are aptly called as swamp buffalos because of their preference to wallow in muddy ponds and swamps. The carabao native to the Philippines and Guam falls under this type. Swamp type buffalos are domesticated and used as a draught animal. They mainly used in the cultivation in rice paddies, for carrying heavy loads and transportation. They strive in cool weather conditions and are considered as pets because of their ability to work.

The river type of water buffalos is a common breed from the Indian sub-continent. They are usually found in India, Pakistan, Turkey and Egypt. The river buffalo's primary purpose is for its milk production. These buffalos produce milk at a large extent that is why they are also reared as pets. They thrive in moderate weather conditions and they mostly stay in rivers and clean waters.

[12] Value Chain Analysis: Buffalo Dairy, Central Visayas, Department of Agriculture, February 2017

Table 7. Common Breeds of Buffalo in the Philippines

SWAMP TYPE	RIVER TYPE
Philippine Carabao (Native)	**Murrah Buffalo**
	
The native Philippine carabao is a swamp type buffalo. Carabaos like to wallow in swamps and marshlands. The color is light grey and lighter in the legs and outside the body and the ears. Horn is generally curved toward and inward to form a semi-circle from the base of the head. Upper surface of horns has grooves. Low wide and heavy built body with sufficient type of draft and meat. The average mature weight for male is 500 kgs while the female is 425 kgs. Average milk production is 1.45-2.64 kgs/day.	This breed originates from India. Jet black in color with white switch in the tail and have a soft and fine skin texture. Murrah buffalos are massive and stocky in built with light neck and head. They have short limbs with broad hips and drooping quarters and wedge shape conformation. Udder and teats of Murrah buffalos are well developed. The average size of male and female Murrah buffalos is 625 and 525 kgs. Average milk yield is 5-7 kg. Per day.

Source: ***Livestock Division, DA-RFU VII*** *(www.mix.ph.com/carabao-production-introduction-breeds/)*

The Philippine carabaos are mostly used for working and for meat production, while the Murrah buffalo imported from Bulgaria is for milking purposes. Murrah buffalo produces more milk than the native carabao having an average milk yield of 5-7 kg./day as compared to 1.45-2.64 kg./day of the native carabao. These two breeds can also be found in Bohol and two more others through cross breeding.

There are 2 known crossbreeds in Bohol. The 1st generation cross is 50% native buffalo and 50% Murrah. The 1st Generation produces milk of 4.5 to 7 liters per day. The 2nd Generation Backcross is 75% Murrah Buffalo and 25% Native Buffalo. The 2nd generation produces an average of 6 to 8 liters of milk per day.

In summary, Bohol has 5 breeds of buffalo - the native carabao, the 1st generation crossbreed, the second-generation crossbreed, the Riverine types of buffalo which includes the American Murrah buffalo and Bulgarian Murrah buffalo, and lastly the Italian Murrah buffalo.

Figure 29. Picture of Buffalo

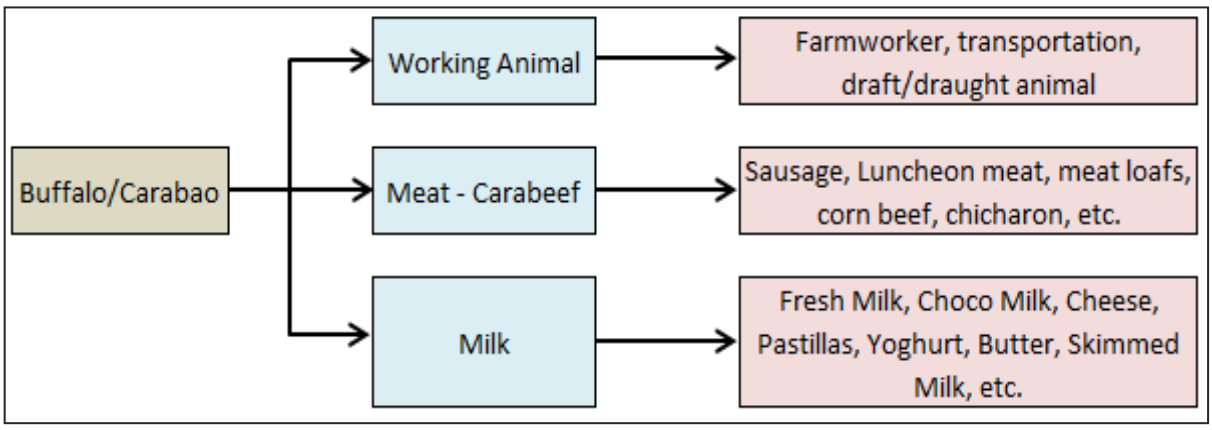
1st GENERATION CROSS

2nd GENERATION BACKCROSS

In the Philippines, buffalos or commonly called as carabao, kalabaw in tagalog and kabaw in bisaya is the national animal in the country. The carabao symbolizes strength and hardwork for the Filipinos. For the Filipino farmers, the carabaos are considered as the farmer's best friend and also known as the "beast of burden." The carabao is a very important animal especially for Filipino farmers. Since most of the farmers especially rice farmers in the country are smallholders and have less capital to purchase machines, they use the carabao to plow the field. Carabaos are also used as transportation and as draft animals. Wooden carts are attached to the animal to carry heavy loads or loads are carried by the carabaos on their back and travel from the mountains to the markets located near the main roads.

As seen on figure below, there are also other uses of carabao in the country. Carabaos are also raised for their meat and milk. As cited in the PCAARD-DOST web site, carabeef or the meat from the carabaos are important component of comminute proportions such as sausages, luncheon meat, meat loaf and canned corn beefs wherein it is partly carabeef. Because of the carabeef's inherent high water holding, meat product manufacturers utilize carabeef extensively. Consumers also attracted to carabeef products because it does not lose much its original form when cooked. Aside from that, carabeef is priced much lower than beef. In Bohol, the carabeef are also used for tapa and chicharon.

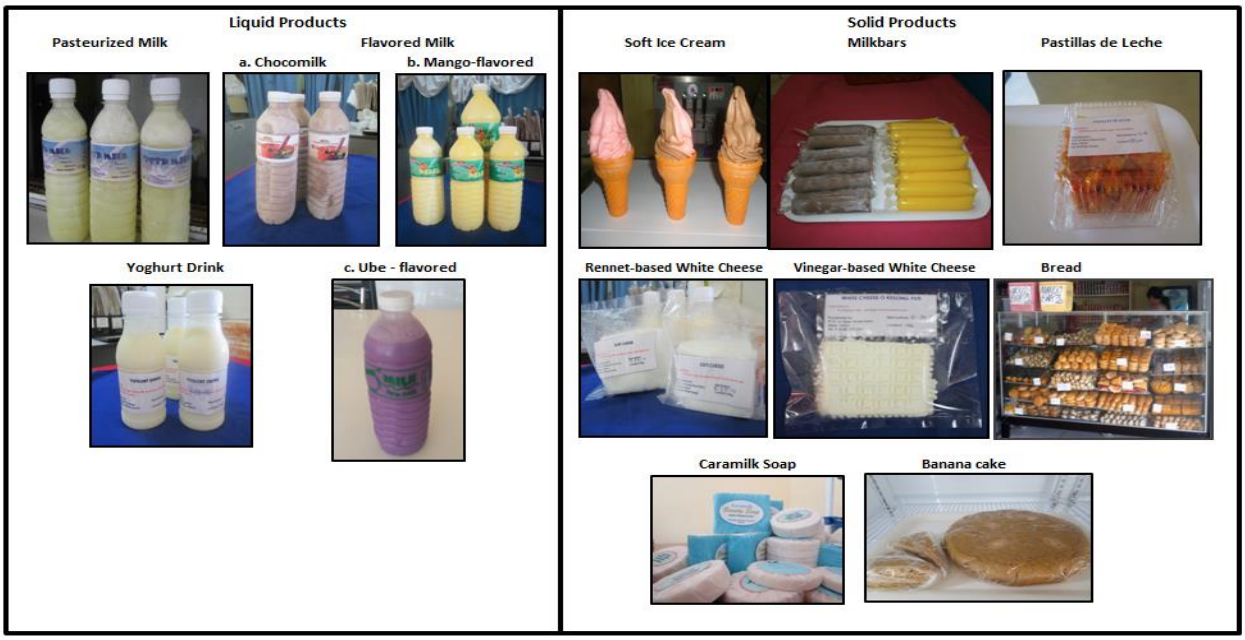
Figure 30. Functions and uses of Carabao in the Philippines



Milk is another product that is produced from carabaos. According to FAO, buffalo is the second largest source of milk in the world accounting 13% of the total production next to cattle which encompasses 83%. Milk from carabaos is further processed into other product formats both in liquid or solid forms. Liquid forms include fresh milk, choco milk, flavoured milk and yoghurt drinks. Solid form includes white cheese or "*kesong puti",* pastillas, mozzarella cheese. In other

countries, buffalo milk is also used for butter, butter oil or ghee, soft and hard cheese, condensed and evaporated milk, skimmed milk, buttermilk and etc.

Figure 31. Different Milk Products in Bohold



Shown on Figure 31 above are the different milk products from Buffalo dairy found in the province. The products are categorized into liquid and solid products. Liquid products include the pasteurized milk, flavoured milk (chocolate and mango) and yoghurt drink. Another liquid product not in the picture is the raw milk and homogenized milk. Solid products includes ice cream, milkbars which also have chocolate and mango flavours, pastillas de leche, white cheese and bread loafs. Also included are soap bars made from carabao milk.

Domestic Production

The Philippine Carabao Center - Ubay Stock Farm (PCC-USF) maintains herd of purebreds, crossbreeds, and native breeds. The stock farm serves a satellite gene pool and breeder farm for their dispersal program and research thrusts.

Table 8. Philippine Carabao Current Inventory

	Philippine Carabao	**USMB x BMB**	**BMB**	**USMB**	**Total**
Female	83	105	77	24	289
Male	20	124	50	0	89
Total	**103**	**229**	**127**	**24**	**378**

USMB – US Murrah Buffalo
BMB – Bulgarian Murrah Buffalo
Source: ***Philippine Carabao Center (PCC), 2017***

Buffalos are found in almost all regions in the Philippines as these are common domestic animals, utilized by small hold farmers engaged in mixed farming system with 1-5 heads per family. Table 9 shows that the buffalo population in the Philippines is steadily increasing from

2014 to 2017 with average annual growth rate of -0.26% mainly due to sharp decrease in 2013-2014.

Table 9. Buffalo Inventory in the Philippines, 2013-2017 (by heads)

	2013	2014	2015	2016	2017	Ave. Annual Growth Rate
PHILIPPINES	**2,912,842**	**2,847,445**	**2,854,838**	**2,877,091**	**2,881,894**	**-0.26%**
WESTERN VISAYAS	310,114	313,592	312,583	311,366	306,855	**-0.10%**
BICOL REGION	257,943	269,100	278,331	288,641	302,610	**4.07%**
CAGAYAN VALLEY	258,092	252,830	247,171	242,831	235,936	**-2.22%**
EASTERN VISAYAS	280,210	234,612	233,613	230,637	225,421	**-5.06%**
CENTRAL LUZON	204,094	211,966	217,665	223,978	223,036	**0.33%**
SOCCSKSARGEN	235,330	222,195	213,500	211,722	208,684	**-2.94%**
CENTRAL VISAYAS	**172,662**	**174,501**	**177,952**	**181,531**	**183,676**	**1.56%**
CALABARZON	172,016	171,388	171,696	170,091	176,002	**0.59%**
ILOCOS REGION	161,197	157,057	160,310	163,561	165,850	**0.73%**
DAVAO REGION	162,009	162,621	162,801	162,219	160,519	**-0.23%**
Others	699,175	677,583	679,216	690,514	693,305	**-0.20%**

Source: ***Philippine Statistics Authority, 2017***

Table 9 shows the trend of supply and disposition of carabaos. Buffalo inventory posted a decrease between 2011 to 2013 by 2.36% and recovered by the end of 2015 by 0.78%. The decreasing buffalo inventory from 2011-2013 is marked by decreasing population and increased death losses due to diseases. 2013-2015 posted increasing buffalo inventory mainly due to the decreased death losses and slaughtered carabaos, despite the decrease of live born calves.

Table 10. Carabao Inventory by Farm Type and Use Classification

	2011	2012	2013	2014	2015	% Share 2015
Total	**3,075,259**	**2963980**	**2,912,842**	**2,847,445**	**2,854,838**	**100%**
Backyard	3,063,741	2,951,714	2,900,681	2,835,818	2,842,768	99.58%
Commercial	11,518	12,266	12,161	11,627	12,070	0.42%
Slaughtered**	481287	461929	457073	461493	453699	15.89%
Dairy**	14,681	15,677	16,364	16,829	17,299	0.61%
Farm Work*	2,579,291	2,486,374	2,439,405	2,369,123	2,383,840	83.50%

* Computed value, assuming carabao has no other use aside from meat and milk

** PSA industry data

Source: ***Philippine Statistics Authority***

Table 10 shows the breakdown of the inventory according to farm type and purpose, with 99.58% owned by backyard farmers and 83.50% utilized for farm work of the 2.85 million carabaos. This shows that a huge percentage of carabaos in the country, which are mostly owned

by backyard farmers, are utilized for agricultural work. The carabao as a meat (15.89%, assuming that all slaughtered carabaos are utilized for carabao meat) and milk (0.61%) source, remains a potential yet to be maximized.

Table 11. Buffalo Inventory in Central Visayas, 2013-2017 (by heads)

	2013	2014	2015	2016	2017	% Annual Growth	% Share 2017
CENTRAL VISAYAS	**172,662**	**174,501**	**177,952**	**181,531**	**183,676**	**1.59%**	**100.00%**
Bohol	65,962	67,383	68,522	69,576	70,057	1.55%	**38.14%**
Cebu	46,909	47,098	47,722	48,414	49,213	1.23%	**26.79%**
Negros Oriental	58,985	59,199	60,864	62,664	63,474	1.90%	**34.56%**
Siquijor	806	821	844	877	932	3.91%	**0.51%**
Backyard							
CENTRAL VISAYAS	**172,144**	**173,953**	**177,403**	**181,011**	**183,113**	**1.59%**	**99.69%**
Bohol	65,488	66,883	68,014	69,092	69,583	1.56%	99.32%
Cebu	46,909	47,098	47,722	48,414	49,213	1.23%	100.00%
Negros Oriental	58,941	59,151	60,823	62,628	63,385	1.88%	99.86%
Siquijor	806	821	844	877	932	3.91%	100.00%
Commercial							
CENTRAL VISAYAS	**518**	**548**	**549**	**484**	**474**	**-2.12%**	**0.26%**
Bohol	474	500	508	484	474	0.00%	0.68%
Cebu	0	0	0	0	0	0.00%	0.00%
Negros Oriental	44	48	41	36	89	25.57%	0.14%
Siquijor	0	0	0	0	0	0.00%	0.00%

Source: ***Philippine Statistics Authority***

Central Visayas is 7th among all regions with 6.37% share of the country's buffalo headcount. Table 11 shows that the buffalo population in the region has not been affected by the Typhoon Yolanda in 2013 and continued to increase at a growth rate of 1.59%. All provinces showed increasing buffalo population with Siquijor posting the highest growth rate by 3.91%. In addition, 99.69% percent of buffaloes in the region are owned by backyard farmers, with less than 1% growing in commercial farms.

Bohol has the highest buffalo population at 38.14% in 2017 due to the flourishing local buffalo dairy industry. PCC, Provincial Local Government of Bohol, and involved municipalities pursued programs on the development of crossbreeds, provision of veterinary supplies and vitamins, and establishing enterprise. Demand for the local buffalo dairy products from institutional buyers, schools, and government feeding programs have enabled the buffalo dairy farming in the province to be a profitable enterprise, with the Bohol Dairy Producers Association (BoDPA) as the main driver.

Philippine Milk Production

In the Philippines, there are 3 milk sources: cattle, carabao and goat. Table 12 shows that cattle has the highest dairy population with 55.17%, followed by the carabao (40.07%) and goat (4.77%). Cattles and carabaos comprise more than 95% of the dairy population, as these are the most common domestic animals in households. Furthermore, milk production was followed by the carabao at 34.93%. Juxtaposing population and milk production suggests that cattles have higher milk yield pre head ratio compared to carabao. If milk yield of dairy carabaos are improved, it can add the milk supply provided mostly by cattle milk.

Figure 32. Distribution of Milk Production by Animal Type, Philippines, 2015 ('000L)

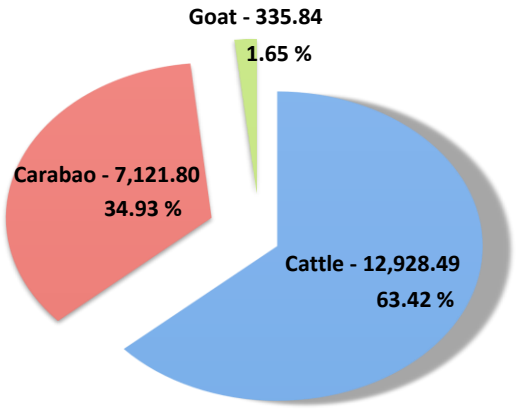


Table 12. Dairy Animal Inventory by Number of Heads (2012-2016)

Animal Type	2012	2013	2014	2015	2016	Annual Growth Rate	% Share 2016
Total	**36,547**	**39,069**	**40,322**	**41,781**	**44,432**	**10.22%**	**100.00%**
Cattle	19,292	21,067	21,605	22,498	24,512	6.76%	55.1%
Carabao	15,677	16,364	16,829	17,299	17,802	3.39%	40.07%
Goat	1,578	1,638	1,888	1,984	2,118	8.56%	4.77%

Source: ***Dairy Industry Performance Report***

To improve the genetic potential for milk and meat production, PCC implemented the Genetic Improvement Program, to conserve the local existing germplasm and introduce high milk-producing riverine breeds. This maximizes the benefits from both specie to meet immediate and long term requirements of the rural poor and growing human population. Gene pool of existing local swamp buffaloes are maintained in institutional farms for the conservation and propagation of Philippine carabaos. Farmers-cooperators are given selected native carabaos for breeding and farming activities. National Gene Pool and satellite gene pool in PCC regional centers also produce semen from elite riverine breeds utilized for the artificial insemination (AI) program nationwide. Natural mating is also undertaken through the PCC Bull Loan Program facilitated by trained village-based AI technicians (VBAITs).

The Enterprise Development Program supports the establishments of community organizations and cooperatives of smallholder farmers to develop profitable carabao-based enterprise. This is supplemented by access to superior breeding animals of farmers, infrastructure support for production and processing, training of technicians and farmers for the best practices of carabao growing, and business development.

Table 13. Central Visayas Buffalo Milk Production (in Liters)

Province	2014	2015	2016	Annual Growth Rate	% Share 2016
Bohol	136,052.72	139,577.42	149,256.83	4.85%	89.65%
Cebu	13,018.50	7,588.00	17,231.75	32.36%	10.35%

Source: ***Philippine Carabao Center, 2016***

Table 13 shows that milk production in the region is increasing for the past two years at a rate of 5.50%. Bohol posted the highest milk production with 89.65% share. This is mainly attributed to the higher buffalo population, presence of PCC institutional facilities and growing local buffalo dairy industry. Cebu, on the other hand, only contributed 10.35% to the total milk production but nonetheless had a higher growth rate at 32.36%.

Table 14. Dairy Carabao Inventory in Bohol by Sex and Age, 2017

Farm Type	Female			Male			Total	% Share
	Calf	Heifer	Cow	Calf	Jr. Bull	Sr. Bull		
Individual Farmers	45	71	189	34	5	4	**348**	47.93%
PCC-USF	54	113	122	77	3	9	**378**	52.07%
Total	**99**	**184**	**311**	**111**	**8**	**13**	**726**	**100%**

Source: ***Philippine Carabao Center, 2017***

Table 14 shows the carabao inventory in Bohol, nearly equally shared between PCC-USF (government institutional farm) at 52.07% and individual farmers (47.93%). The inventory shows 81.82% of the total are female carabaos, while males are 18.18%. This translates to a milk yielding population as female carabaos are dominant. Male calves, at most 2 years old, consist 84.09% of the male population. This set of young male carabaos can be used for the expansion of the local buffalo population through the Bull Loan Program of the PCC.

Female calves and heifers are potential sources of milk, once these animals are impregnated and properly cared for. They consist 47.64% of the female population and could add to the current milk source, there is also a 4.5:1 female to male ratio in the dairy carabao inventory. Currently, there are 77 pregnant heifers and cows out of 594 females.

Table 15. Buffalo Dairy Production in Bohol by Farm Type (2014-2016) (in Liters)

Farm Type	2014	2015	2016	Annual Growth Rate	% Share 2016
Individual Farmers	54,129.87	58,128.06	72,174.13	16.67%	48.36%
Institutional Farms	81,922.85	81,449.36	77,082.70	-2.95%	51.64%
Total	**136,052.72**	**139,577.42**	**149,256.83**	**4.85%**	**100.00%**

Source: ***Philippine Carabao Center, 2016***

There are two main sources of milk in Bohol. Individual farmers and the PCC-USF, which is a government institutional farm. Dairy farmers in Bohol are mostly found in the dairy zones identified by the PCC located in 6 municipalities: Alicia, Dagohoy, Inabanga, Mabini, San Miguel, and Ubay disaggregated in Table 15. From 2014-2016, dairy production in Bohol has increased by 4.85%. It is notable to see the 16.67% increase of milk production by the individual farmers, while PCC posted -2.95%. The decrease in the milk production of PCC was pronounced in 2016, the same year the farmers posted a sharp increase in milk production.

In August 2015, Bohol Dairy Producers Association (BoDPA) transformed to a major dairy enterprise which carried out toll processing and milk collection through its cooperative/association units. Milk was bought by BoDPA and toll processed at PCC, and marketed throughout the province. The revenues of BoDPA made farmers aware of the profit from the buffalo dairy business and this attracted them to maximize their milk production. According to PCC, farmers were considered to be beginners in terms of proper milk extraction and collection in 2015. However, with the desire to increase their income from milk production, the farmers learned the proper practices of milk extraction and collection. This led to the increase in milk production in 2016.

Table 16. Milking Carabaos and Milk Production on Top-Producing Municipalities, 2016

Municipalities	Milking Carabao (heads)					Volume of Milk Produced (L)	No. of Farmers
	CB	IMB	RB	SB	Grand Total		
Alicia	11		3	16	30	6,210.73	23
Dagohoy		1	1	16	18	2,480.55	14
Inabanga				9	9	252	9
Mabini	48	3	28	40	119	23,552.68	74
Pilar	4		1	6	11		
San Miguel	18		2	18	38	3,192.29	33
Ubay	96	4	29	78	207	37,362.17	155
Total	**177**	**8**	**64**	**183**	**432**	**73,050.42**	**308**

CB-Cross Breeds; IMB-italian Murrah Buffalo; RB-Riverine Breeds; SB Swamp Breeds
Source: ***Philippine Carabao Center, 2016***

Table 16 shows the milking carabaos in Bohol, with Ubay posting the highest inventory and volume of milk produced. This is because PCC-USF is taken into account, which is located in Ubay. Next to Ubay is Mabini which also has the 2nd highest carabao dairy population and volume of milk produced. Pilar has not posted volume of milk production as the animals are yet to mature. These areas were the selected areas of PCC for dairy production, adjacent municipalities to Ubay where PCC-USF is situated. Carabaos of the dispersal programs facilitated by the PCC were distributed throughout these municipalities, which are also prioritized for the free vitamin, injections, supplements, biologics, and vaccinations. It should also be observed that there is a 1:1.4 farmer to milking carabao ratio.

Nature and Structure of the Industry

- **Value Chain Mapping**

Figure 33. Geographical Flow of Buffalo Dairy

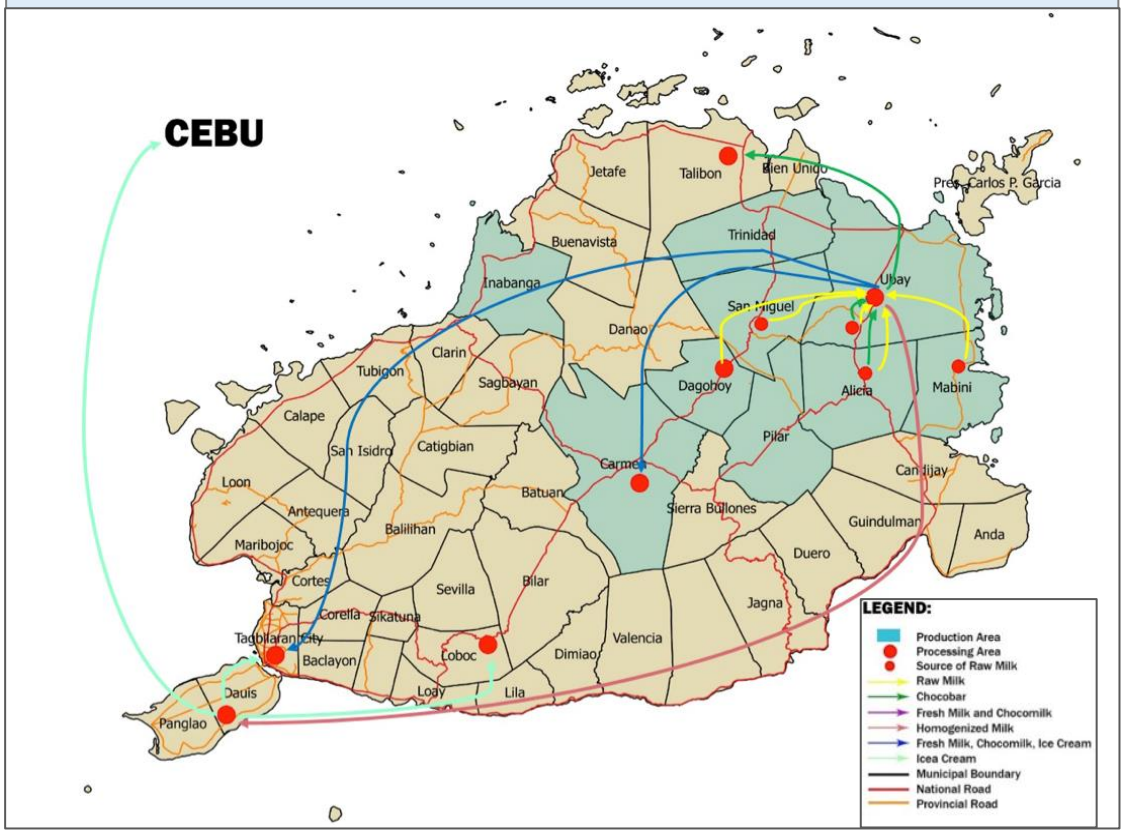


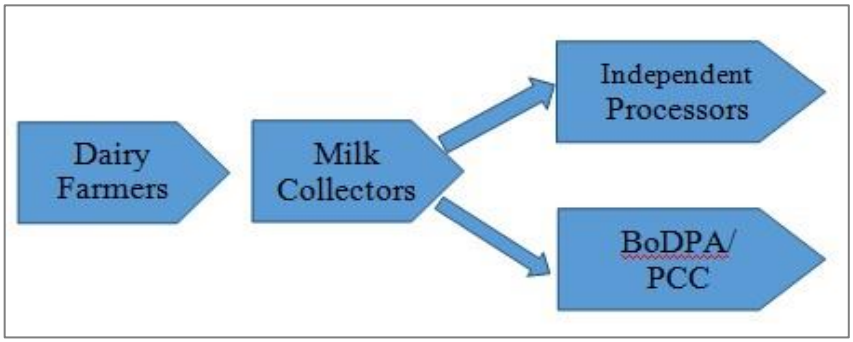
Figure 33 above shows the geographical flow of raw buffalo milk and select processed dairy products. Market flow of buffalo dairy is mostly within the province – collected, processed, and distributed through the partnership between PCC and BoDPA. Homogenized ice cream by Bohol Be Farm is distributed outside of Bohol to outlet(s) in Cebu. PCC also supplies the milk outside of Bohol, to avoid market conflict with BoDPA.

BoDPA facilitates the distribution of dairy products processed by toll in PCC to various hotels, resorts, malls, coffee shops, tourism sites and selected outlets across the province. Cooperatives and farmers' Association also process and distribute chocobars, pastillas de leche, soap, and choco milk. The most popular are cheesy sweets, torta, pastillas, fresh milk and ice cream. Pasteurized milk is also being distributed to various schools and barangays in line with the milk feeding program of the government. This is in line with the directive of the Provincial Local Government of Bohol to link up the province's dairy production with the tourism industry to create awareness and product in the market.

Main processor is the PCC, producing fresh milk, homogenized milk. Flavored milk (mango and choco), white cheese, and pastillas de leche. Homogenized milk is supplied to Bohol Bee Farm to be processed to their own homogenized ice cream. Select cooperatives also process various products albeit at lower volumes. The partnership between PCC and BoDPA works such that the milk collected from individual farmer are processed by a toll fee of P10.00/liter in the PCC

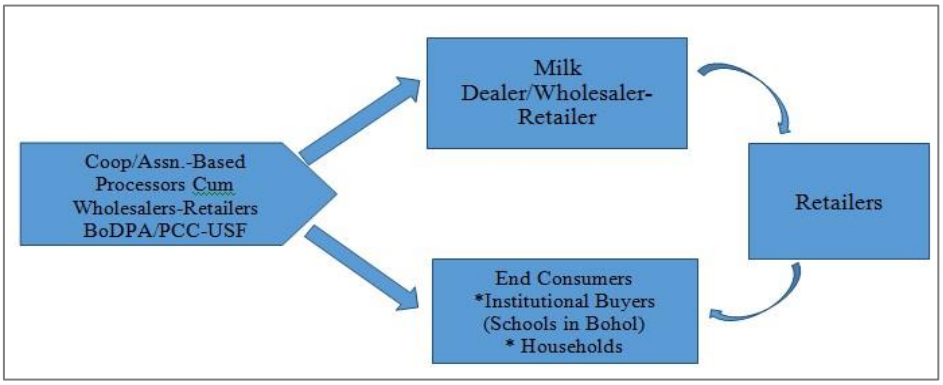
processing center, and marketed within Bohol. Milk is collected and consolidated through the cooperative and association units to BoDPA and delivered to PCC. Figure 34 shows the flow of raw milk in Bohol. Milk produced in the PCC-USF is processed and marketed by PCC to locations outside Bohol, with identified buyers from Cebu and Leyte.

Figure 34. Flow of Raw Milk in the Province of Bohol



The farmer-producers of Bohol sell their milk to Bohol Dairy Producers Association (BoDPA) through their respective cooperatives/association, wherein most of them are members. Incentives are given to the farmers through the patronage refund from their respective cooperatives maintaining a stable market and price for their product. Figure 34 shows the product flow across processors, wholesaler-retailers to the end consumers.

Figure 35. Flow of Pasteurized Milk and Milk Products

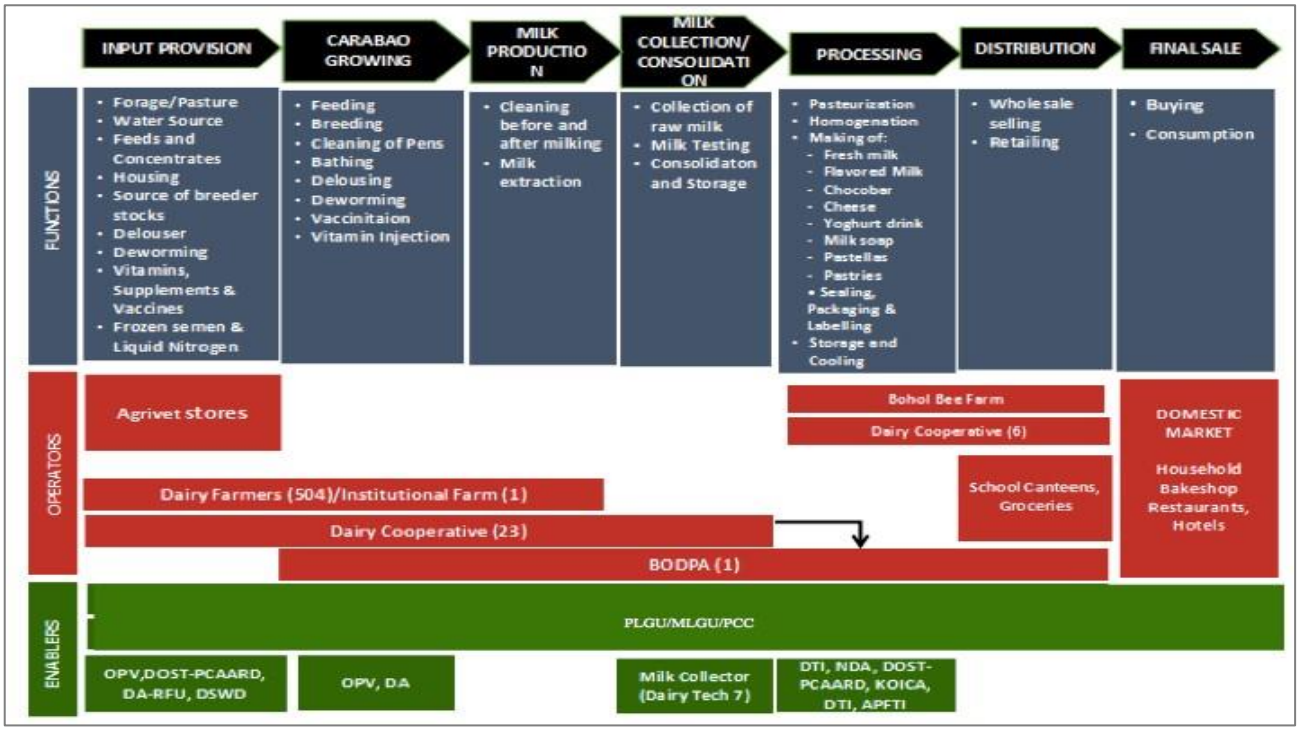


There are various players in the buffalo dairy industry in Bohol which perform input provision, carabao growing, milk production, milk collection/consolidation, processing distribution, and final sale. The players involve are the dairy farmers, input providers, dairy cooperatives, processors, and distributors. The whole chain is illustrated in Figure 36 below.

Input provision involves sourcing of breeder stocks or semen, farm inputs such as forage, feeds, concentrates, veterinary supplies, water and supplements, for the care and maintenance of the animal. The chain moves forward to carabao-growing which involves feeding, breeding, sanitary and health maintenance. For milk production, farmers extract milk from the carabao which are then collected and consolidated into collection centers, which are normally the cooperatives. Up to this segment, dairy farmers and cooperatives work together to ensure good breeding and raising practices and production of good quality milk Processing and distribution is undertaken

by BoDPA, ensuring constant supply of raw milk to PCC's processing facilities and delivering the products to various outlets and establishments.

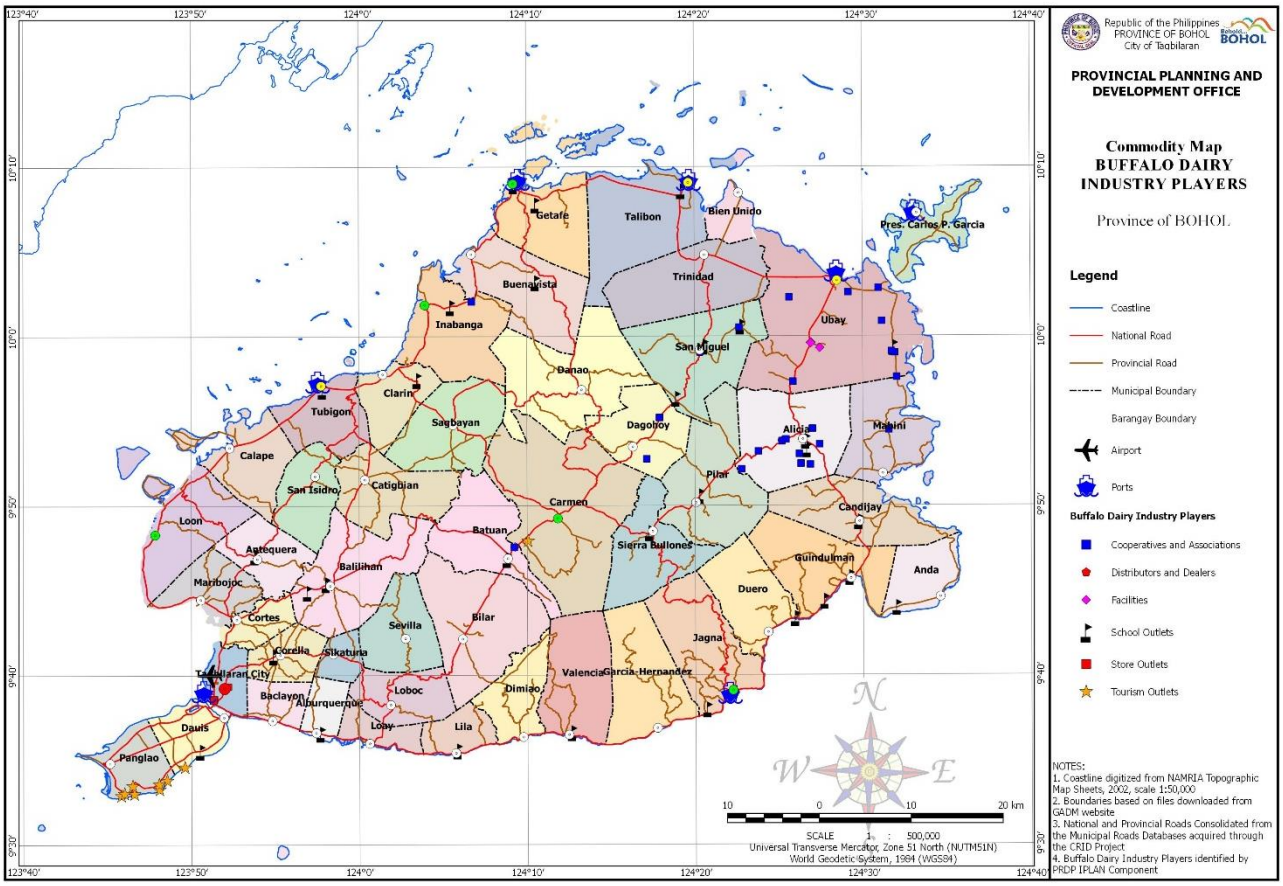
Figure 36. Buffalo Dairy Industry Value Chain Map



Enablers involved throughout the whole chain are the Provincial Local Government of Bohol thru the Office of the Provincial Veterinarian (OPV), the local government units (LGUs), and PCC which is mandated to promote and develop the carabao dairy industry. They provide assistance to players through trainings pertaining to various segments of the chain, dispersal programs, free vitamins injections, supplements, vaccines, toll processing and partnership on usage of facilities and equipment. The Department of Agriculture (DA) Department of Science and Technology – Philippine Council for Agricultural, and Natural Resourced Research and Development (DOST – PCAARRD), Department of Social Welfare and Development (DSWD) provide capability trainings and material inputs under provision and carabao-growing. Department of Trade and Industry (DTI), National Dairy Authority (NDA), DOST-PCAARRD, Korean International Cooperation Agency (KOICA), Advocate of Philippine Fair-Trade Inc. (APFTI) have executed assistance in the processing of dairy-based products.

Commodity Map

Map 17. Commodity Map: Buffalo Dairy Industry Players



Competitiveness Vision

Within the next 3 years, dairy buffalo industry in the province will have increased productive and healthy dairy herd producing increased volume of quality safe milk and milk-based products using standard state of the art facilities and equipment, managed by enterprising dairy farmers organizations/ cooperative who are responsive to the growing market demands and working harmoniously with other stakeholders within the dairy buffalo value chain and is compliant with industry policies.

Investment Plan

The Provincial Government of Bohol recognizes dairy as one of the commodity champions that has potential as an industry to boost profitable income and help minimize if not eliminate malnutrition in the communities. This recognition is manifested through the Dairy Development Program implementation with strong partnership with institutions leading the dairy industry like the Philippine Carabao Center (PCC) and the National Dairy Authority (NDA). The introduction of dairying particularly in carabaos has slowly shifted the impression for the carabao as just a farming buddy into an economic opportunity and enterprising venture. The VCA conducted tells that buffalo dairying in the province is still on its infant stage where aggressive and strategic

promotional awareness and activities have yet to be done. Foremost, the dairy herd should be amplified to increase milk yield with nutrition and animal health given equal attention to produce quality and good volume of milk. Support facilities should be operational within standards while government support and regulations should be in placed with governing bodies to provide guidance. Eventually, the increase in milk yield will bring about farmers' income, expanded economic activities and strengthen the operation of farmer organizations with strong horizontal and vertical relationships with all other participants in the value chain. Considering the province as a prime tourist destination, the increasing health consciousness and the on-going program of the government to reduce malnutrition among children, milk and milk products are assured of its market.

Summary and Rank of Constraints

The constraints indicated in the value chain of dairy buffalo are herein ranked according to priorities. It can be noted that top priority is given to constraints that affect mostly the production of milk and milk products. However, those that follow are inter-related having one constraint affected and or connected to the next constraints. These also show that proposed interventions are not "stand alone"; it will be simultaneously responded with convergence of resources by a number of players in the value chain.

Table 17. Summary and Rank of Dairy Buffalo Value Chain Constraints

Constraints	Rank
• Lack of dairy breeds & high price in purchasing dairy breeds	1
• High cost of commercial feeds & limited access to formulated feeds	1
• Insufficient veterinary medicine due to inaccurate inventory of buffalo	3
• Limited areas for forage production	1
• Limited potable water system for drinking water source of buffaloes, as water from deep wells is unsafe for consumption	1
• Limited materials for silage making in some backyard farms	1
• Lack of water storage during long summers & El Niño season	1
• Limited forage during long droughts	1
• Limited potable water system (PWS) and lack of electric pump for cleaning and feeding of buffalos because not all deep wells in the area are well covered and cemented	2
• Low calf drop rate against confirmed pregnancies	2
• Low pregnancy rate of female carabaos due to the following:	
a) Non-compliance of farmers to the recommended proper care & management of carabao	1
b) Inadequate nutrition	1
c) Unpreparedness of the carabao in terms of physical & physiological conditions (e.g. low body condition score & with reproductive problem)	1
d) Poor monitoring & follow-up of the carabaos condition especially to interior barangays due to absence of service vehicles, gas & food allowance of the technicians	3
• Slow adoption rate of farmers of new technology	2

Constraints	Rank
• Shelter for the buffaloes	1
• High mortality of purebred carabaos (15% in Bohol) due to diseases, heat stroke & accident (ie. Strangulation & snake bites)	1
• Poor housing facilities & pens for milking in many backyard farms, leading to milk contamination	1
• Poor milk production performance of dairy carabao due to poor nutrition & management *	1
• Milk yield not maximized due to lack of temporary cold storage	2
• Poor road conditions & worn-out service vehicles which cause delayed delivery, milk spoilage & high cost of transportation	1
• Inadequate milk collection centers & lack of cold storage facilities in collection centers	2
• Lack of processing facilities & dairy processing equipment at the cooperative level	3
• Lack of FDA/ BFAD certification of the processed products	1
• Poor packaging materials & labeling of carabao milk products	2
• Limited laboratory facilities for research and development which could improve quality products (i.e. smell, texture of milk, temperature, expirations)	3
• Limited capital by home-based processors	2
• Poor road conditions which contribute to the early spoilage of liquid milk products	1
• Lack of vehicles for delivery & marketing (*ie. Chiller vans to avoid spoilage of milk)*	1
• Limited knowledge on operational management, branding, marketing & product promotion	1
• Limited awareness of Boholanos & nearby provinces on the availability and nutritional qualities of buffalo fresh milk from Bohol	2
• Higher market price compared to milk products from other animals	3
• More defined arrangement with retailers, as products not sold and nearing spoilage are returned to BoDPA	3
• Milk collectors or AI technicians are not available at all times to cater the needs of the raisers	3
• Limited transport vehicles of AI technicians and dairy technicians to extend services to far-flung barangays	1
• Limited access to financial services for investment capital and financing for inputs from formal credit companies	3
• Limited financial capabilities of cooperatives to offer credit loans to members	3
• Lack of regular or structured updating of data from LGUs to OPV (Re: inventory, death losses, morbidity)	2
• Lack of vaccine supply with some LGUs not counter-parting allocations of OPV	3
• Not all BALA designates have background on agricultural or livestock systems, no clear cut incentives except insurance and trainings	3

Table 18. Summary of Opportunities

Opportunities
Segment 1. Input Supply • Increase in number of dairy buffalo breeds • Presence of indigenous low-cost materials for housing construction (e.g. bamboo, nipa) • Available planting materials for grasses, legumes for forage development and agro-industrial by-products and waste (i.e. copra, cassava, rice straw) as feed ingredients • Areas with high pasture suitability • Training module for silage making is available for use by the farmers • Feed formulation of PCC available to farmers **Segment 2. Carabao Raising** • Inland water sources in the area surrounding the production areas • Vitamins, vaccines, delousers and other biologics given for free by PCC and PLGU/MLGU through their BAHA/BALA programs • Training modules for health provision (paravet) and ovarian palpation and proper care and management of carabaos are available and provided to the farmers • Available AI technicians and bull breeders who can be called by the farmers if they need assistance in the care and breeding of their animals **Segment 3. Milk Production** • Infusion of purebred and crossbreeding with local carabaos which are high milk producers • Sufficient knowledge on proper sanitation and milk extraction • Available training and technical assistance on proper milking and good hygiene and sanitation during milking • Customized housing pens for carabao milking are established by raisers **Segment 4. Milk Collection** • Proper milk handling by using stainless milk cans for collecting milk • Increasing dairy carabao population and increasing milk production in the province **Segment 5. Processing** • Available high-tech equipment for milk soap processing • Available modern milk processing techniques which reduce waste and spoilage • Presence of ISO certified PCC processing facilities • Observance of quality standards in the processing of products • Training and technical services on milk processing available at PCC, NDA and DTI **Segment 6. Distribution**

Opportunities

- High demand of choco milk and choco bars among younger consumers
- High demand for raw quality milk and dairy products due to increasing number of domestic and foreign tourists visiting Bohol
- Presence of ports and sub-ports especially in dairy zones which makes delivery of products easier and more efficient

Segment 7. Support Services

- Presence of institutions focus on dairy (PCC and NDA) in the region
- Provision of technical assistance from PCC and OPV
- Active involvement of PCC-accredited and knowledgeable VBAITs

Expanded-Vulnerability and Suitability Assessment (E-VSA)

Only 4 parameters were used in the assessment and selection of priority sites using EVSA as a tool, namely; poverty incidence, carabao inventory, carabao raisers and slaughterhouse inventory. The data (2021) are sourced from the Philippine Carabao Center (PCC) except for poverty incidence which is from the PPDO.

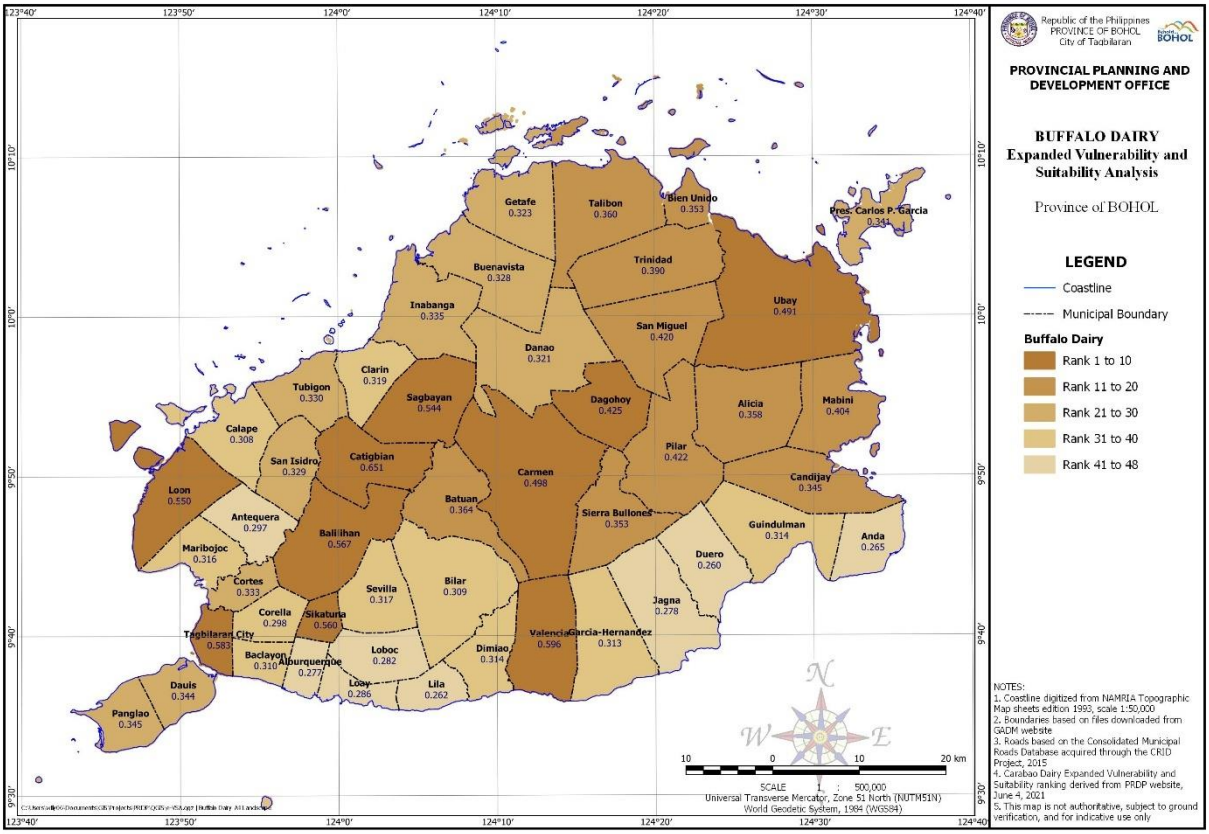
Table 19. E-VSA Ranking of 47 Municipalities

Municipality	Poverty Incidence	Carabao Inventory	Carabao Raisers	Slaughterhouse Improvement	New Rank
Catigbian	37	1616	1221	0.25	**1**
Valencia	28.5	2543	1245	0.25	**2**
Tagbilaran City	7.9	5	5	0.25	**3**
Balilihan	31.3	560	444	0.25	**4**
Sikatuna	29	217	192	0.25	**5**
Loon	22	206	179	0.25	**6**
Sagbayan	24	1202	740	0.25	**7**
Carmen	38.4	4286	3347	0	**8**
Ubay	39.6	4540	1919	0	**9**
Dagohoy	40.7	2466	1407	0	**10**
Pilar	38.8	1904	1724	0	**11**
San Miguel	42.7	2287	1316	0	**12**
Mabini	46.8	1802	1487	0	**13**
Trinidad	39.7	1887	1239	0	**14**
Batuan	32.3	854	566	0	**15**
Talibon	36.4	1988	1187	0	**16**
Alicia	33.9	1261	720	0	**17**
Bien Unido	48.8	788	482	0	**18**
Sierra Bullones	35.1	1582	1056	0	**19**
Candijay	34.5	1232	822	0	**20**
Panglao	16.4	53	45	0	**21**

Municipality	Poverty Incidence	Carabao Inventory	Carabao Raisers	Slaughterhouse Improvement	New Rank
Dauis	17	20	16	0	**22**
Pres. CP Garcia	51.8	602	323	0	**23**
Inabanga	34.7	833	459	0	**24**
Cortes	15.9	50	32	0	**25**
Tubigon	26.7	845	643	0	**26**
San Isidro	44.9	641	517	0	**27**
Buenavista	45.5	1563	884	0	**28**
Jetafe	43.5	1004	614	0	**29**
Danao	42.7	1412	854	0	**30**
Clarin	26.4	771	562	0	**31**
Sevilla	31.7	751	422	0	**32**
Maribojoc	17.3	97	69	0	**33**
Guindulman	30.3	754	536	0	**34**
Dimiao	30.6	1464	452	0	**35**
Garcia Hernandez	28	1470	1044	0	**36**
Baclayon	15.1	35	22	0	**37**
Bilar	22.6	939	506	0	**38**
Calape	25.4	470	366	0	**39**
Corella	17.9	203	138	0	**40**
Antequera	18.5	212	194	0	**41**
Loay	19.3	35	20	0	**42**
Loboc	21.5	380	232	0	**43**
Jagna	19.6	992	611	0	**44**
Alburquerque	15.9	126	83	0	**45**
Anda	30.9	152	104	0	**46**
Lila	19.6	105	57	0	**47**
Duero	29.6	389	346	0	**48**

The system-generated results show the ranking of the 47 municipalities including the City of Tagbilaran (Table 19). It can be noted that the top 5 areas are considered dairy zones where most of the dairy production and processing activities are taking place.

Map 18. Expanded Vulnerability and Suitability Assessment Analysis (EVSA) Maps



Investment Priorities

The over-all estimated investment cost for dairy buffalo is **P4,959,600,000.00** where the biggest bulk of the interventions which represents 87.99% is for the rehabilitation and upgrading of access roads while the development of the dairy buffalo industry amounts to P677,000,000.00. Farm to market road infrastructures play significant role in providing access and link from production sites to the market. Selected road sections have been identified in Annex 1.

The proposed interventions identified in the 3-year Investment Plan are based on the gaps and constraints indicated by segments in the Value Chain Analysis conducted for the industry. The formulation of the PCIP has been subjected to series of consultations, arriving at a consensus on the prioritized interventions. Results from the EVSA ranking are used as reference in identifying locations of prosed project

Table 20. Summary of Investment for Dairy Buffalo
Province of Bohol

Proposed Interventions	Estimated Cost (P000,000,000)			
	Year 1	Year 2	Year 3	Total
SEGMENT 1: INPUT SUPPLY				
Total Segment 1 >	**142.30**	**124.70**	**116.80**	**383.80**
SEGMENT 2: CARABAO GROWING				
Total Segment 2 >	**37.50**	**36.70**	**25.30**	**99.50**
SEGMENT 3 : MILK PRODUCTION				
Total Segment 3 >	**12.00**	**9.20**	**6.20**	**27.40**
SEGMENT 4 : MILK COLLECTION /CONSOLIDATION				
Total Segment 4 >	**4.50**	**3.00**	**2.00**	**9.50**
SEGMENT 5 : PROCESSING				
Total Segment 5 >	**19.50**	**13.50**	**47.50**	**80.50**
SEGMENT 6 : DISTRIBUTION				
Total Segment 6 >	**16.50**	**9.60**	**8.60**	**34.70**
SEGMENT 7: SUPPORT SERVICES				
Total Segment 7 >	**15.10**	**15.00**	**11.50**	**41.60**
GRAND TOTAL	**247.40**	**211.70**	**217.90**	**677.00**
Construction/ Rehabilitation of Farm-to-Market Roads (Length - 282.07 kilometers)	**1,653.20**	**1,653.20**	**1,653.20**	**4,959.60**

UPDATED PCIP Matrix for Buffalo Dairy Using Interim Approach

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
SEGMENT 1 : INPUT SUPPLY														
Lack of dairy breeds & high price in purchasing dairy breeds	Strengthen upgrading program													
	a) Intensify campaign for AI services	- AI Services marketing conducted, campaign intensified down to barangays, increasing coverage from 34 to 47 municipalities	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, BALA AI Techns.	1 M	1 M	1 M	PGBh-OPV MLGU		1
	b) Implement AI services "with a fee"	- 1 implementing guidelines with support provincial ordinance formulated, approved & adopted	Province wide	Province wide	Province wide			PGBh-OPV, SP, PCC, DA						3
	c) Sustain the provision of cash crop incentives to Municipal based AI Tech.	- 47 AI Technicians provided cash crop incentives	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, DA, PCC				DA PCC NDA		1
	d) Conduct of trainings	- Additional AI technicians trained, increasing number of regular AI Technicians from 34 to 47 & village-based technician from 15 to 60	Province wide	Province wide	Province wide		Incorporate DRRM topics on training programs to increase risk awareness in the livestock sector.	PGBh-OPV, MLGU, DA, BAI, PCC, ATI	1 M	1 M	1 M	PGBh-OPV MLGU DA PCC ATI		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
		- 1 capdev program for AI developed, approved & implemented	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, DA, PCC, ATI, NDA				MLGU, DA, PCC, ATI, NDA		2
	e) Establishment procurement & operation of support facilities and equipment	- Liquid nitrogen plant operational	Tagb. City			Sinkholes - Tagbilaran	Refer to Geologic Hazard Map- Construction of LN2 plant be away from areas with sinkholes	PGBh-OPV, DA RFO7	15.3 M	1 M	1 M	PGBh-OPV, DA-RFO7		1
		- 48 liquid nitrogen mother tanks procured	16 mun	16 mun	16 mun			DA RFO7, PCC	7.2 M			PGBh-OPV, DA, RFO7, PCC Donors (CONBUSAC)		2
		- 1,047 animal squeezer chutes installed in 1,047 mainland barangays	500 brgys	400 brgys	147 brgys	Tropical cyclone – Alicia, Anda, Bien Unido, Buenavista, Candijay, CPGarcia, Danao, Getafe, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood – Alicia, Batuan, Buenavista, Candijay, Guindulman, Mabini, Pilar, Sevilla Erosion – Alburquerqu	Tropical Cyclone - Construction of climate-resilient facilities, natural wind breaks should also be considered in the site selection, Flood - construction be away from flooded area, construction of flood barriers, floodways on areas where squeezer	PGBh-OPV, MLGU, PCC DA-RFO7,	6.9 M	6.9 M	6.9 M	PGBh-OPV, MLGU, BLGU, DA-RFO7, PCC Donors (CONBUSAC)		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						e, Alicia, Anda, Antequera, Baclayon, Balilihan, Bilar, Buenavista, Carmen, Corella, Dagohoy, Danao, Dimiao, Duero, Garcia Hernandez, Guindulman, Jagna, Lila, Loboc, Mabini, Sagbayan, San Isidro, Sevilla, S Bullones, Sikatuna, Valencia Landslide (Rain Induced) – Duero, Garcia Hernandez, Jagna, Sagbayan, S Bullones Landslide (Earthquake Induced) – Alicia, Carmen, Dimiao, Garcia	chutes are located Erosion - Sloping agricultural land technology (SALT) and contour farming techniques to mitigate erosion and landslide risks as well as planting forage and pasture grass that would help control erosion, slope stabilization								

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Hernandez, Guindulman, Jagna, Loboc, Pilar, S Bullones, Valencia Drought – Carmen, Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea level rise – CPGarcia, Getafe, Inabanga, Talibon Storm surge – Anda, Baclayon, Bien Unido, CPGarcia, Getafe, Guindulman, Mabini, Panglao, Talibon, Ubay Salt water intrusion - Bien Unido, Dauis, Panglao, Trinidad	Sea Level Rise - Construction of sea wall, mapping of storm surge and salt water intrusion zones to determine areas away from possible storm surges or salt water intrusion								
	f) Registration of qualified breeders	- 1,000 dairy cara-cows ear tagged, registered &	Alicia Carmen Dagohoy Mabini	Bien Unido Candijay Sierra Bullones	Danao Inabanga Carmen			PGBh-OPV, MLGU, BLGU,	0.5 M	0.5 M	0.5 M	PGBh-OPV, DA, PCC		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
		qualified as breeders	San Miguel Pilar Ubay	Talibon Trinidad Tubigon				PCC						
	g) Upgrading of existing dispersal carabaos of the province with dairy breed	- 1,500 cara-heifers/ cara-cows upgraded with dairy breed	Buenavista Dagohoy Danao Getafe Inabanga San Miguel Talibon Trinidad Ubay Pilar Sierra Bullones	Province wide	Province wide			PGBh-OPV, MLGU, PCC	5 M	5 M	5 M	PGBh-OPV, MLGU, PCC		1
	Operation of buy-back system	- Buy back fund provided to purchase breedable animals which are offsprings from AI	Province wide	Province wide	Province wide			PGBh-OPV, DA, PCC, MLGU	5 M	5 M	5 M	BAI, DA, PCC, PRDP		3
		- Implementing guidelines with support policies formulated, approved & adopted	Tagb. City					PGBh-OPV, SP, DA, PCC						3
	Operation of a "localized system" on carabao multiplier farm	- At least 1 carabao multiplier farm established - Implementing guidelines formulated, approved & adopted	San Miguel Tagb.			Tropical Cyclone - San Miguel Drought - San Miguel Sinkholes - Tagbilaran City	Construction of climate-resilient facility, natural wind breaks should also be considered in site selection Construction of small water impounding project Refer to geo-hazard map in	PGBh-OPV, SP, PCC, PO Farmers Private Individual			15 M	PCC, PRDP		2 2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
							site selection to determine areas away from sinkholes Strengthen animal health program, consider provision of drugs and biologics include Waste Mgt. in compliance with ECC Requirements PCIC Insurance							
	Stock infusion & distribution	- 50 cara-heifer & cara-bulls procured	Ubay			Tropical Cyclone - Ubay Drought - Ubay Storm Surge - Ubay Diseases	- Selection of high-quality breed of animals - Strengthen quarantine of newly procured animals - PCIC Insurance - construction of climate-resilient facility, consider natural wind breaks in the selection of site -construction of water impounding, mapping of storm surge zones to	PCC		7.5 M		PCC		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
							determine areas away from storm surge - consider construction of evacuation area for livestock							
		- Expansion of DSWD dairy dispersal program thru the SLP Program	Alicia Carmen Dagohoy Mabini San Miguel Pilar Ubay	Bien Unido Candijay Sierra Bullones Talibon Trinidad Tubigon	Danao Inabanga Carmen			PCC, DSWD, PGBh-OPV				DSWD		3
High cost of commercial feeds & limited access to formulated feeds	Feed mill operation	- 3 feed mills established & operated by POs	Ubay	Carmen	Tubigon	Tropical Cyclone - Ubay Erosion - Carmen Drought - Ubay, Carmen, Tubigon Storm Surge – Ubay Environmental pollution (dust, noise)	- Construction of climate-resilient facility, consider natural wind breaks, -construction of retaining wall, planting of forage and pasture to help control erosion and additional feed for the animals -construction of water impounding -site selection must be away from storm surge zones -include Waste Mgt. in compliance	PGBh-OPV, PCC, POs	5 M	5 M		PGBh-OPV, PCC, DA, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
							with ECC Requirements							
	Feed resource development & silage production & marketing	- Documentation of available feed ingredients	Province wide	Province wide	Province wide			PGBh-OPV, USF, PCC, DA	1 M			PGBh-OPV, PCC, DA		1
		- Feed ration developed using indigenous feed ingredients	Ubay					PGBh-OPV, USF, PCC, DA	0.5 M			PGBh-OPV, PCC, DA		1
		- 3 PO-based feed related capacity development/ trainings conducted	Ubay	Carmen	Tubigon			PGBh-OPV, USF, PCC, DA, ATI	2 M	2 M		PGBh-OPV, DA, ATI, PRDP		1
		- Silage production & marketing commercialized	Ubay	Carmen	Tubigon			PGs	5 M	5 M	5 M	PGBh-OPV, DA, PCC, PRDP		1
		- Utilization of farm by products such as rice straw, corn stover, cassava, etc. will be promoted, developed & adopted	Prov-wide	Prov-wide	Prov-wide			PGBh-OPV, USF, PCC, DA, OPA				PGBh-OPV, PCC, DA, OPA		1
	Operation of agricultural tractor for forage & animal feed development	- 3 agricultural tractors procured & operated with support implementing guidelines & policy	Ubay	Carmen	Tubigon	Tropical Cyclone - Ubay Erosion - Carmen Drought - Ubay, Carmen, Tubigon Storm Surge - Ubay	- Construction of climate-resilient shed for the tractor "- Procurement of machineries conform with PAES from AMTEC accredited supplier	PGBh-OPV, USF, PCC, DA, PGs, POs/ Coop	2.5 M	2.5 M	2.5 M	DA, PRDP		2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
							construction of traction shed on areas away from storm surge zones							
	Operation of forage chopper	- 3 units forage/ grass chopper procured & operated with support implementing guidelines	Ubay	Carmen	Tubigon	Tropical Cyclone - Ubay Erosion - Carmen Drought - Ubay, Carmen, Tubigon Storm Surge - Ubay "	- construction of climate resilient shed for forage chopper, consider natural wind breaks in the selection of site - planting of forage and pastures to help control erosion, - construction of water impounding - Procurement of machineries conform with PAES from AMTEC accredited supplier	PGBh-OPV, USF, PCC, DA, PGs/ POs/ Coop	0.3 M	0.3 M	0.3 M	PGBh-OPV, DA, PCC, PRDP		1
Insufficient veterinary medicine due to inaccurate inventory of buffalo	Fund sourcing/ allocation of funds for veterinary medicines	- Funds allocated for veterinary medicines	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, BLGU, DA, PCC	3 M	3 M	3 M	PGBh-OPV, MLGU, BLGU, DA, PCC		1
		- Counter-parting scheme on fund allocation for veterinary medicines institutionalized	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, BLGU, DA						1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	Inventory of carabaos	- Inventories conducted per barangay - 1 data collection tool formulated & adopted	Province wide Tagb. City	Province wide	Province wide			PGBh-OPV, MLGU, BLGU, BALA, PSA	3 M	3 M	3 M	PGBh-OPV, PCC, DA		1 1
		- Breedable dairy animals validated & ear tagged	Province wide	Province wide	Province wide			PGBh-OPV, PCC, DA						3
	Implementation of unified animal health program for carabaos	- Unified animal health program for carabaos adopted	Province wide	Province wide	Province wide	Diseases	- Strengthen animal health program - Provision of drug and biologics	PGBh-OPV, MLGU, BLGU, BALA, PCC	48 M	48 M	48 M	PGBh-OPV, PCC, DA, BAI		1
	Promote the use of ethno-veterinary medicine & NFTS technology	- 15 dairy POs adopting Ethno-vet. & NFTS Techno - 15 trainings/ capacity development conducted - Equipment & materials procured & distributed	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga			PGBh-OPV, USF, MLGU, PO/ PG	0.7 M	0.6 M	0.2 M	PGBh-OPV, PCC, DA, LDC		3 3 3
Limited areas for forage production	Silage production & marketing	- 3 POs undergoing silage production & marketing	Ubay	Carmen	Tubigon			PGBh-OPV, USF, MLGU, POs, Coops	5 M	5 M	5 M	PGBh-OPV, DA, PCC, PRDP		1
	Expansion of forage production in potential areas like use of idle vacant lands & under tree crops & plantations	- 6 POs adopting forage development under orchard, silvi-pasture, along irrigation canals & under plantations	Ubay	Carmen	Tubigon	Tropical Cyclone - Ubay Erosion - Carmen Drought - Ubay,	- Selection of potential areas protected against inadvertent weather condition	PGBh-OPV USF MLGU POs	0.5 M	0.5 M	0.5 M	PGBh-OPV, DA, PCC		2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Carmen, Tubigon Storm Surge - Ubay	- construction of water impounding - areas away fro storm surge zone be considered for the site selection							
	Promote & execute Lease agreement/ usufruct on land use	- Lease agreements executed	Dairy zones	Dairy zones	Dairy zones			PGBh-OPV, DENR						3
Limited potable water system for drinking water source of buffaloes, as water from deep wells is unsafe for consumption	Operate potable water system for livestock-related operations	- 5 water systems developed, constructed & operational	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao, Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones	- Selection of areas not prone to water pollutants -construction be away from areas prone to flooding - Construct climate and geologic resilient structure -construction of retaining wall - construction of water impounding	PGBh, MLGU, BLGU	7 M	6 M	2 M	PRDP, PEO		2 2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alivia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido	- mapping out of storm surge zones and construction site must be away from areas with storm surge and sea level rise - construction of sea wall								
		- Existing water system & sources improved				Erosion - Carmen Landslide (Earthquake Induced) - Carmen Drought - Carmen	- construction of retaining wall, - construction of water impounding							

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	Conduct regular water testing & quality monitoring	- Water testing & quality control at least 2 times year	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao, Inabanga			BEMO, PHO, Private	0.3 M	0.3 M	0.3 M	BEMO, PHO, Private		1
Limited materials for silage making in some backyard farms	Identification, documentation & info dissemination	- Available backyard silage materials identified & used	Province wide	Province wide	Province wide			PGBh-OPV, USF, DA, MLGU	0.2 M	0.2 M	0.2 M			1
	Procure & made available support materials & equipment for silage making	- Support materials & equipments made available *(i.e. bags, molassess)*						PGBh-OPV, USF, MLGU, PO/PG	3 M	3 M	3 M	PGBh-OPV, PCC, DA		1
Lack of water storage during long summers & El Niño season	Construction & operation of water storage facilities/ structures	- 26 barangay-based mini-dams/ small water impounding/ reservoirs, rain collectors established/ rehabilitated	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) –	- Construction of climate resilient facility - Selection of areas not prone to water pollutants	PGBh, MLGU, BLGU, NIA, PEO	3.5 M	3 M	1 M	NIA, PEO, PGBh, DA, PRDP		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Sierra Bullones Landslide (Earthquake Induced) – Alivia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
		- 26 concrete water tanks constructed & operational	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay	-Construction of climate resilient facility -Selection of areas not prone to water pollutants -Construction of retaining walls	PGBh, MLGU, BLGU, PGs, POs	3.5 M	3 M	1 M	PEO, PGBh, DA, Cong. Fund, PRDP		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alivia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay								

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Salt Water Intrusion – Bien Unido								
		- Water containers/ barrels/ stainless water tanks procured & provided	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga			PGBh, MLGU, BLGU, PGs, POs	1 M	1 M	1 M	PGBh, DA, Cong. Fund, PRDP		1
Limited forage during long droughts	Massive plantation of adaptive forage plants that are drought tolerant and can maintain growth in the dry season	- 26 has. planted to forages	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alivia, San	-Selection of climate resilient varieties -Selection of areas not prone to flooding -Selection of potential varieties resistant to drought condition	PGBh-OPV, USF, PG	0.2 M	0.2 M	0.2 M			1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
	Silage production & marketing	- 3 POs undergoing silage production & marketing	Ubay	Carmen	Tubigon			PGBh-OPV, USF, MLGU, POs, Coops	5 M	5 M	5 M	PGBh-OPV, DA, PCC, PRDP		3
	Continue developing cropping systems (crops + forage) for food/ feed production	- Crop + forage cropping systems developed/ continued	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, OPA, PO/ PG						1
	Establishment & operation of a PO-operated forage nurseries/ parks	- 15 forage nurseries/ forage parks established & operated by POs	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San	- Construction of climate resilient facility - Refer to hazard maps in	PGBh-OPV, USF, PCC, PO/ PG	0.2 M	0.2 M	0.2 M	PGBh-OPV, USF		2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido,	site selection of potential areas -Construction of water impounding								

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
SEGMENT 2: CARABAO GROWING														
Limited potable water system (PWS) and lack of electric pump for cleaning and feeding of buffalos because not all deep wells in the area are well covered and cemented	Provision/ acquisition of water storage & installation of water distribution lines	- 5 water systems developed/ constructed & operational	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel,	-Selection of areas not prone to water pollution - Construction of climate-resilient facility/building	PGBh, MLGU, BLGU, PO	7 M	6 M	2 M	PGBh, MLGU		2 1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
		- Existing potable water system & sources improved												
		- Neighborhood water system established & operational by clustering of sources												3
		- Water pumps, solar , STW installed/ constructed for personal & farm use of farmers						OPA, MLGU, DA	2.5 M	2.5 M	2.5 M	OPA, MLGU, DA		3
Low calf drop rate against	Strengthen monitoring	- Pregnant animals monitored & calves	Province wide	Province wide	Province wide			PGBh-OPV, PCC, MLGU-AI	0.5 M	0.5 M	0.5 M	PCC		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
confirmed pregnancies		dropped monitored, reported & validated						Tech, VBAIT						
Low pregnancy rate of female carabaos due to the following:	Capacity development of farmers	- 6 trainings conducted with emphasis on animal health, breeding, nutrition & reporting	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga			PGBh-OPV, PCC, ATI, DA	0.7 M	0.6 M	0.2 M	PGBh-OPV, PCC, ATI, DA		2
	Adopt the farmer livestock school	- 6 batches of farmers participating & adopting the livestock school	Ubay Alicia San Miguel Dagohoy Pilar Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon	Danao Inabanga			PGBh-OPV, ATI, PCC, MLGU	2.1 M	1.8 M	0.6 M	PGBh-OPV, ATI, PCC, MLGU		2
	Conduct heat synchronization & AI services	- 26 barangay/ purok-based synchronization & AI services conducted	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, MLGU	1.2 M	1.4 M	0.4 M	PGBh-OPV, PCC, MLGU, DA		1
	Operation of breeding corrals/ stations in the barangays with a stationed breeder cara-bull	- 26 PO-operated communal breeding stations constructed & operational	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar	-Compliant with regulatory agencies - Natural wind breaks be considered in site selection - Construction of climate resilient facility - Site selection should be away from	PGBh-OPV, PCC, MLGU, BLGU, PO/PG				PGBh-OPV, PCC, MLGU, BLGU, PRDP		2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido	areas prone to flooding - Construction of rataining wall, planting of forage and pastures to help reduce erosions - Construction of water impounding - Mapping out of storm surge zones to determine areas away from those zones and be considered in the site selection - Construction of climate-resilient facility/building							

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Environmental (fecal matter, urine) Pest & diseases	-Solid waste management (following proper waste disposal) -PCIC Insurance -Strengthen Animal Healthcare Program							
a) Non-compliance of farmers to the recommended proper care and management of carabao	Execution of contracts & imposition of dairy carabao production & management policies	- All dairy farmers have executed contracts & adopted the policies on dairying	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PCC PO/ PG						1
b) Inadequate nutrition	Forage & pasture development	- All dairy farmers have planted & have available forages & pasture	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia,	-Selection of climate resilient varieties	PGBh-OPV, USF, PCC, MLGU, PO/PG	0.5 M	0.5 M	0.5 M	PGBh-OPV, USF, PCC, MLGU		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
	Formulation, production & utilization of a	- Dairy ration formulated & utilized	Ubay					PGBh-OPV, USF, PCC, DA	0.2 M			PGBh-OPV, USF, PCC, DA		2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	ration for dairy animals													
c) Unpreparedness of the carabao in terms of physical & physiological conditions *(e. low body condition score & with reproductive problem)*	Implement a conditioning/ flushing regime prior to breeding season	- All dairy farmers have practiced conditioning/ flushing of animals prior to breeding	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, USF, PCC, DA, PO/PG	1 M	1 M	1 M	PGBh-OPV, USF, PCC, DA		1
d) Poor monitoring & follow-up of the carabaos Condition especially to interior barangays due to absence of service vehicles, gas & food allowance of the technicians	Establishment/ strengthen built-in monitoring & reporting system within the POs	- All dairy POs have practiced monitoring & reporting mechanisms	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PCC, PGBh-OPV, PO	0.5 M	0.5 M	0.5 M			1
	Strengthen the operation of the BALAs & village-based AI technicians	- Implementing guidelines (including criteria) formulated, approved & adopted & institutionalized *(i.e BALAs are allowed to collect fees of certain services*	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, BABALA, PCC	2 M	2 M	2 M	PGBh-OPV, MLGU, PCC		3
Slow adoption rate of farmers of	Farmer modeling	- 6 model dairy farmers developed & provided	Ubay Mabini	San Miguel Alicia	Tubigon Inabanga			PCC, PGBh-OPV, POs	2 M	2 M	2 M	PGBh-OPV, PCC, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
new technology		technical, equipment & facility support												
	Capacity devt of farmers	- 2 educational & observation trips conducted	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PCC, PGBh-OPV, ATI	3 M	3.5 M	1 M	PGBh-OPV, PCC, ATI, PRDP		1
	Accreditation of dairy farmers/ farm	- All dairy farmers accredited/ certified	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, DA	0.6 M	0.7 M	0.2 M	PGBh-OPV, PCC, DA		3
		- Accreditation guidelines developed, approved & adopted												3
	- Organize dairy farmers	- No. of branches of Dairy POs created - 26 municipal Organizations formed & operational	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, DA	1 M	0.5 M	0.2 M	PGBh-OPV, PCC, DA		2
	Continuous program advocacy	- No. of barangay assemblies & purok meetings attended	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, ATI, BoDPA						2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
Shelter for the buffaloes	Establishment/ construction of communal animal sheds	- 15 communal animal sheds following prescribed " standards " constructed	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay	-Construction of climate resilient building/ facility -Compliant with regulatory agencies -Solid waste management (following proper waste disposal) -PCIC Insurance -Strengthen Animal Healthcare Program	PGBh-OPV, PCC, DA, PO/ PG	2 M	2 M	2 M	PGBh-OPV, PCC, DA, PO/ PG, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido Diseases									
		- 1 management system/ implementing guidelines formulated, approved & adopted	Tagb.					PGBh-OPV, PCC, DA						1
High mortality of purebred carabaos (15% in Bohol) due to diseases, heat stroke & accident (ie. Strangulation & snake bites)	Implement a carabao insurance system	- All dairy carabaos are insured	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Flood, Typhoon, Landslides, Storm Surge, Diseases	- Enrollment to insurance (PCIC) - Strengthen animal health program	PGBh-OPV, PCC, DA, PCIC	4.1 M	4.1 M	1.6 M	PGBh, PCC, DA, PRDP		1
		- 5 M indemnity fund provided	Tagb.	Tagb.	Tagb.			PGBh-OPV, PCC, DA	1.6 M	1.6 M	1.6 M	PGBh, PCC, DA, PRDP		2
	Adoption of a unified animal health program for dairy carabaos	- Unified animal health program for carabao formulated, approved &	Province wide	Province wide	Province wide			PGBh-OPV, PCC, DA	2 M	2 M	2 M			1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
		adopted/ implemented												
		- Counter-parting scheme on the allocation of drugs & biologics formulated, approved & adopted	Province wide	Province wide	Province wide			PGBh-OPV, PCC, DA, MLGU						1
	Capacity development of farmers	- 25 trainings conducted at PO level focusing on animal health & production management & disease incidence reporting	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, DA, MLGU, ATI	2 M	2.5 M	1 M	PGBh, PCC, DA, PRDP		1
SEGMENT 3 : MILK PRODUCTION														
Poor housing facilities & pens for milking in many backyard farms, leading to milk contamination	Imposition of required "standard" housing facilities for backyard dairy farmers	- 1 "standard housing" facility developed & adopted - All backyard dairy farmers are using the "standard" housing design	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao,	- Construction of climate-resilient building/ facility	PGBh-OPV DA, PCC	1 M			PGBh-OPV, DA, PCC, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
	Capacity development of dairy farmers	- 2 trainings conducted on milk handling & hygienic practices	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones	Danao Inabanga			PGBh-OPV DA, PCC, ATI	3 M	3 M	3 M	PGBh-OPV, DA, PCC, ATI, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
				Tubigon Pilar										
	Establishment of a communal milking parlor with a mechanical milking machine, solar power	- 3 communal milking parlors established	Mabini	Pilar	Alicia	Tropical Cyclone - Alicia, Mabini Flood- Alicia, Mabini, Pilar Erosion - Alicia, Mabini Landslide (Earthquake Induced)- Alicia, Pilar Drought - Mabini, Pilar Storm Surge - Mabini	- Construction of climate resilient building/ facility - Compliant with regulatory agencies - Implement proper Solid waste management		3 M	3 M	3 M			3
Poor milk production performance of dairy carabao due to poor nutrition & managemen t *	Establishment & operation of a PO-operated communal milking/ dairy farm	- 5 PO-operated communal dairy farms established & operational with support implementing guidelines	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao,	-Construction of climate resilient building/ facility - Compliant with regulatory agencies - Implement proper Solid waste management	PGBh-OPV, PCC, MLGU, NGO, PG/PO,	5 M	3 M		PGBh, PCC, MLGU, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
Milk yield not maximized due to lack of temp. cold storage	Operation of cold storage facility	- 3 cold storage facilities procured & operational	Mabini	Pilar	Alicia	Tropical Cyclone - Alicia, Mabini Flood- Alicia, Mabini, Pilar	- Construction of climate-resilient facilities	PGBh-OPV DA, PCC, PO/ PG	0.2 M	0.2 M	0.2 M	PGBh-OPV, DA, PCC, PRDP		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Erosion - Alicia, Mabini Landslide (Earthquake Induced)- Alicia, Pilar Drought - Mabini, Pilar Storm Surge - Mabini	- Compliant with regulatory agencies - Implement proper Solid waste management							
SEGMENT 4 : MILK COLLECTION /CONSOLIDATION														
Poor road conditions & worn out service vehicles which cause delayed delivery, milk spoilage & high cost of transportation	Construction of new & rehabilitation of existing roads	- 282.07 kilometers of FMRs constructed/ rehabilitated	Ubay Alicia San Miguel Dagohoy Mabini	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	"Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) –	-Slope Stabilization -Improve Drainage System -Installation of Seawalls and Barriers -Resilient Road Materials -Conduct of Risk Assessment Maintenance and monitoring -Surface Protection (Paving and Surfacing; vegetative cover) -Reforestation -Use of bioengineering for slope stability	PGBh-PEO, MLGU, BLGU	4.9B			PGBh-PEO, PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido	-Sediment control Elevation & Structural Design (Bridges & causeways; Reinforced structures; elevated roads) -Environmental Measures such as natural Buffers								
	Operation of a refrigerated transport vehicle for milk or chiller van for milk	- Refrigerated transport vehicle procured & operational with support implementing guidelines/ policy	Ubay					PGBh, PCC, PO/PG	2.5 M			PRDP		1
Inadequate milk collection centers & lack of cold	Establishment & operation of milk collection centers	- 5 clusters of milk collection centers with cold storage facilities established &	Ubay Alicia San Miguel Dagohoy Mabini	Trinidad Talibon Candijay Bien Unido	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay,	-Construction of climate-resilient facility	PGBh-OPV, PCC, PO/PG	2 M	3 M	2 M	PGBh-OPV, PCC, PRDP		2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
storage facilities in collection centers		operational with support implementing guidelines/ policies	Carmen	Sierra Bullones Tubigon Pilar		Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon	-Compliant with regulatory agencies -Implement proper Solid waste management								

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
SEGMENT 5 : PROCESSING														
Lack of processing facilities & dairy processing equipment at the cooperative level	Procurement, operation & maintenance of an integrated processing facility & related equipment	- 2 integrated processing facilities & equipment procured & maintained	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao, Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake	- Provision of climate-resilient and durable equipment - Procurement of machineries according to FDA standards	PGBh, PCC, PO/ PG, Donors, NGO	5 M	5 M	5 M	PGBh, PCC, PRDP		

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
		- 26 milk testing kits procured & utilized	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga							PGBh, PCC, PRDP		

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	Product development expanded	- No. of value added products developed & available in the market (i.e. milk soaps, mozzarella cheese) - 1 study conducted on product acceptability & enhancement	Ubay Alicia San Miguel Dagohoy Mabini Carmen Tagb.	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV PCC, PO/ PG	4 M	4 M	4 M	PGBh-OPV, PCC, PRDP		2
	Estab. of quality (accredited) slaughter & meat processing facility	- 1 facility established according to "required standards" for the utilization of male calves & culled breeders	Ubay			Drought, Storm Surge, Salt Water Intrusion	-Construction of climate resilient accredited facility -Compliance with FDA & NMIS standards	PGBh-OPV, PCC, NMIS, BAI, DA			35 M			2
Lack of FDA/ BFAD certification of the processed products	Establishment & adoption OF production standards for FDA/BFAD certification	- FDA/ BFAD standards adopted in product development & marketing	Ubay					PGBh-OPV, PCC, PO/ PG						1
	Retooling/ refresher on basic food safety for dairy product producers & processors	- 3 trainings conducted	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV PCC	2 M	1 M		PGBh-OPV PCC PRDP		3
Poor packaging materials & labeling of carabao milk products	Secure/ avail consultancy on labeling & packaging	- Enhanced packaging & labeling of products	Ubay					PGBh-OPV PCC						
		- Consultancy conducted/availed	Ubay					PCC PO/PG	1 M			PCC PRDP		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
Limited laboratory facilities for research and development which could improve quality products (i.e. smell, texture of milk, temperature, expirations)	Establishment & operation of a laboratory for dairy & dairy products standardization & quality control	- Laboratory established, approved & operational	Ubay			Drought, Storm Surge, Salt Water Intrusion	-Construction of climate - resilient and compliant laboratory facility	PGBh-OPV PCC, DA, BAI, NDA	6 M	2 M	2 M	PGBh-OPV, PCC, NDA, PRDP		3
	Participate in research fora, scientific summit/ congress	- Number of research fora, Congress participated						PGBh-OPV PCC	0.5 M	0.5 M	0.5 M	PGBh-OPV, PCC, PRDP		4
	Participate in product development & fairs	- Number of fairs participated						PGBh-OPV PCC	0.5 M	0.5 M	0.5 M	PGBh-OPV, PCC, PRDP		3
	Conduct R & D	- Number of researches conducted						PGBh-OPV PCC	0.5 M	0.5 M	0.5 M	PGBh-OPV, PCC, PRDP, BAR		4
Limited capital by home-based processors	Develop lending windows for home-based processors	- At least 1 lending window developed						DSWD, DOST-step program PGBh-OPV PCC, DA				DSWD, DOST-step program, DA		4
	Resource mobilization through submission of proposals, make representations or availment of grants & forging partnership with institutions & funders	- At least 2 proposals prepared, submitted & approved - At least 2 institutions & funders accessed												3
SEGMENT 6 : DISTRIBUTION														
Poor road conditions which contribute to the early spoilage of	Construction of new & rehabilitation of existing roads	- 282.07 kilometers of FMRs constructed/ rehabilitated	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones	Danao Inabanga	Tropical Cyclone – Alicia, Bien Unido, Candijay, Danao,	-Slope Stabilization -Proper Drainage System	PGBh-PEO MLGU BLGU				PEO, MLGU, PRDP		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
liquid milk products				Tubigon Pilar		Mabini, San Miguel, Talibon, Trinidad, Ubay Flood - Alicia, Candijay, Mabini, Pilar Erosion – Alicia, Dagohoy, Danao, Mabini, S Bullones Landslide (Rain Induced) – Sierra Bullones Landslide (Earthquake Induced) – Alicia, San Miguel, Sierra Bullones Drought – Mabini, Pilar, San Miguel, Talibon, Tubigon, Ubay Sea Level Rise – Talibon Storm Surge – Bien	-Surface Protection (Paving and Surfacing; vegetative cover) -Reforestation -Use of bioengineering for slope stability -Sediment control -Maintenance and monitoring -Elevation & Structural Design (Bridges & causeways; Reinforced structures; elevated roads)							

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
						Unido, Mabini, Talibon, Ubay Salt Water Intrusion – Bien Unido								
Lack of vehicles for delivery & marketing (*ie. Chiller vans to avoid spoilage of milk)*	Operation & maintenance of delivery transport/ milk cars/ chiller vans	- 3 transport vehicles procured & operational; a) milk & milk products (mobile parlor) b) Other dairy-based products such as bread & pastries, c) soaps & related products	Ubay					PGBh-OPV PCC PO/ PG	5 M	1 M		PRDP		1 2 2
Limited knowledge on operational management, branding, marketing & product promotion	Capacity development on product devt, promotion & marketing thru:													
	a) Development of operations manual, standards & policies	- 1 Operations Manual formulated, adopted & implemented	Tagb. City					PGBh-OPV DA, PCC, PO/ PG	0.5 M			PGBh-OPV, DA		2
	b) Establishment of a Provincial Dairy Council	- 1 Provincial Dairy Council established & operational	Tagb. City					PGBh-OPV DA, PCC, NDA, BoDPA/ BODACO	0.3 M	0.2 M	0.2 M	PGBh-OPV, DA, PCC		1
	c) Institutionalize the Dairy Development Program	- Dairy Development Program institutionalized	Tagb. City					PGBh-OPV DA, PCC, NDA						1
	Conduct of regular dairy	- Quarterly assessments &	Tagb. City	Ubay	Carmen			PGBh-OPV	0.5 M	0.5 M	0.5 M	PGBh-OPV, DA,		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	assessment & evaluation	evaluation conducted including onsite visits						DA, PCC, NDA, PO/ PG				PCC		
	Conduct survey on product acceptance in hotels, resto & snack bars	- 1 survey conducted that will serve as reference	Tagb. City Panglao Island	Ubay	Carmen			PGBh-OPV, PCC	0.3 M					1
Limited awareness of Boholanos & nearby provinces on the availability and nutritional qualities of buffalo fresh milk from Bohol	Promotions & campaign thru: a) Conduct of tasters' test	- 20 areas conducted with tasters' test	Duero Jagna Candijay Alicia Anda Dauis Dimiao Talibon	Anteq. Corella B-Unido Batuan Buenv. G-Hernd. Lila Tubigon Catigbian San Isidro Tagb. Panglao	Province wide			PGBh-OPV, PCC, PO/ PG	0.2 M	0.2 M	0.2 M	PGBh-OPV PCC		3
	b) Implement milk feeding in schools (with mascots)	- 20 schools adopting/ implementing mik feeding	Province wide	Province wide	Province wide			PGBh-OPV PCC, DSWD, DepED				DSWD, DepED		1
	c) Policy issuances on the following: - Inclusion of milk in the feeding menu	- Issuances formulated, approved, adopted/ implemented	Tagb. City					PGBh-OPV PCC, DSWD , DepED				PGBh, DSWD, DepED		2
	- Provincial directive for fresh milk as a welcome drink or a meal component during catering services in	- 1 provincial directive issued	Tagb. City					PGBh-OPV						1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	trainings & seminars													
	d) Milk-based food cooking competition	- 3 competitions conducted	Tagb Panglao Island	Tagb. Ubay	Tagb. Carmen			PGBh-OPV PCC , NDA	0.5 M	0.5 M	0.5 M	PGBh-OPV, PCC, NDA		3
	e) Ads in tri- & social media	- at least 3 conducted in different forms of ads						PGBh-OPV PCC, BICTU	0.5 M	0.5 M	0.5 M			3
	f) Info drive	- Barangay assemblies, purok meetings, school PTA meetings, market days						PCC, BoDPA	0.2 M	0.2 M	0.2 M			2
	Operate stationary milk outlets/ milk & milk product shops in strategic areas	- 6 outlets/milk product shops established & operated by POs with solar-powered support equipment	Tagb. Panglao Island	Tagb. Ubay	Tagb. Carmen	Sinkholes - Tagbilaran Tropical Cyclone - Ubay Erosion - Carmen Landslide (Earthquake Induced) - Carmen Drought - Carmen, Ubay Storm Surge - Panglao, Ubay Salt Water Intrusion - Panglao	Construction of climate-resilient building	PGBh-OPV PCC , NDA, BoDPA/ BODACO	3 M	3 M	3 M	PGBh-OPV, PCC, PRDP		2
		- Give priority to dairy	Province wide	Province wide	Province wide									2

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
		product shops in government facilities such as Airport terminal, seaport terminal, bus terminal & other government facilities												
	Operate mobile dairy/ milk & milk product carts	- 2 mobile milk carts with solar-powered support equipment operated by POs	Tagb Panglao Is.					PGBh-OPV, PCC , PO/PGs	2 M			PGBh-OPV, PCC, PRDP		1
	Conduct of dairy festival/ congress	- 3 dairy festival/ congress conducted	Tagb	Ubay	Tubigon			PGBh-OPV, PCC, PO/PGs	1.5 M	1.5 M	1.5 M	PGBh-OPV, PCC, PRDP		1
	Enhance the/ implementation of Gatas sa Eswelahan para sa Kabataan Project	- 30 schools actively participating in the project	Province wide	Province wide	Province wide			PGBh-OPV PCC , POs, PGs	0.5 M	0.5 M	0.5 M	PGBh-OPV, PCC		1
Higher market price compared to milk products from other animals	Product development for value adding	- Enhanced existing products & developed new products						PGBh-OPV PCC , POs, PGs, Coops	1.5 M	1.5 M	1.5 M			3
	Price standardization in all outlets	- All dairy products in outlets have at least price standards						Dairy Po, BoDPA, BODACO						3
More defined arrangement with retailers, as products not sold and nearing spoilage are returned to	Establishment & imposition of marketing agreements	- Marketing agreements approved & executed between parties						PO/ PG Estab.						1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
BoDPA														
SEGMENT 7: SUPPORT SERVICES														
Milk collectors or AI technicians are not available at all times to cater the needs of the raisers	Establish / implement PO-based milk collection & transport mechanism	- 26 PO milk collectors identified, trained & accredited by PO & PCC & provided transport support	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullone Tubigon Pilar	Danao Inabanga			PGBh-OPV PCC, PO/ PG	2.5 M	2.5 M	2.5 M	PGBh-OPV, PCC, PRDP		2
		- 26 PO-based dairy technicians created, trained & operational										PGBh-OPV, PCC, PRDP		1
	Strengthen the operation of village-based AI Technicians & BALA	- 60 village-based technicians & BALAs trained, accredited & operational	Province wide	Province wide	Province wide			PGBh-OPV PCC, MLGU	0.5 M	0.5 M	0.5 M			3
	Establishment & operation of a communication system for referral & assistance	- Referral flow/ system established & adopted	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, PO/ PG	0.5 M	0.5 M	0.5 M			1
	Establish built-in monitoring bodies & system	- 26 monitoring bodies within the POs established, trained & operational												1
Limited transport vehicles of AI technicians and dairy technicians to extend services to far-flung	Provision of new motorcycles	- 6 new motorcycles procured	Ubay Alicia San Miguel Dagohoy Mabini Carmen	Trinidad Talibon Candijay Bien Unido Sierra Bullones Tubigon Pilar	Danao Inabanga			PGBh-OPV, PCC, DA, MLGU	1 M			PGBh-OPV, PCC, DA, MLGU		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
barangays														
Limited access to financial services for investment capital and financing for inputs from formal credit companies	Conduct financial information forum with participation of credit/ financing providers	- Financial forum conducted	Tagb.					PGBh-OPV, PCC, DA	0.5 M	0.5 M	0.5 M	PGBh-OPV, PCC, DA		4
Limited financial capabilities of cooperatives to offer credit loans to members	Secure financial assistance/ loans from other sources (Banks, etc.)	- Financial assistance/ loans secured - No. of providers accessed - No. of business plans prepared, submitted & approved/ funded						PGBh-OPV, PCC, DA, PO/ PG, Coop				PCC, PRDP		1
	Increase CBUs of members	- All members have increased CBUs						PO/ PG, Coop						4
	Expand/engage in other income generating projects from: a) culls - undesirable calves - aging breeders b) carabeef utilization & processing c) fattening	- 1 project operational with support implementing guidelines formulated/ developed, approved & implemented						PGBh-OPV, PCC, PO/ PG/ Coops	1 M	1 M	1 M	PCC, PRDP		4
	Capacity development program on dairy enterprise	- 1 capdev program developed						PGBh-OPV, PCC, ATI	1.5 M	1.5 M	1.5 M			3
		- 6 trainings conducted						ATI				ATI		3

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
		- 2 exposure trips to successful dairy enterprise conducted						PGBh-OPV, PCC, ATI				PGBh-OPV, PCC, ATI		1
	Apply as conduit to ACPC													
Lack of regular or structured updating of data from LGUs to OPV (re-inventory, death losses, morbidity)	Strengthen the implementation of the Philippine Animal Health Information System (Phil-AHIS)	- 1 information system operational down to MLGUs with support ICT structures & manpower	Tagb Antequera Balilihan Catigbian Corella Cortes Dauis Panglao Sikatuna B-Unido Buenav. Dagohoy Sagbayan San Miguel Ubay Candijay Carmen Lila Mabini Pilar	Province wide	Province wide			PGBh-OPV DA BAI MLGU	1.5 M	2.8 M	0.5 M	PGBh-OPV, DA BAI, MLGU		1
	Institutionalize Livestock Data Base Management in Municipal Agricultural Offices	- Issuance of memo order for strengthening & regular updating of livestock data base of the MLGUs - Mobilize BALAs & PPM-sectoral committees in data generation	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, PSA, BLGUs, BALA	2.6 M	2.2 M	1 M	MLGU, DA		2
	Data-based implementation of animal health services *(ie. vaccination should be 70%*	- Allocation of budget for health service facilitated	Province wide	Province wide	Province wide			PGBh-OPV, DA, MLGU				PGBh-OPV, DA, MLGU		1

Key Gap/ Constraint in VC Devt.	Brief Description of Potential Intervention	Target Result/ Outcome	Target Areas to be Covered			Major Risks	Risk Adaptation Measures	Proposed Lead & Other Players	Estimated Project Cost			Proposed Sources of Funds	Remarks	Rank
			Y1	Y2	Y3				Y1	Y2	Y3			
	of existing population)													
Lack of vaccine supply with some LGUs not counter-parting allocations of OPV	Issuance of directives/ policies on counterpart allocation of MLGU & BLGUs on drugs & biologics	- 1 directive issued	Province wide					PGBh-OPV, MLGU						1
	Provision of start- up stocks on drugs through roll-over scheme	- Implementing guidelines developed, approved & implemented							2.5 M	2.5 M	2.5 M			3
		- Funds allocated						PGBh-OPV, DA, MLGU, DSWD				PGBh-OPV, DA, MLGU, DSWD		2
Not all BALA designates have background on agricultural or livestock systems, no clear cut incentives except insurance and trainings	Continuous capacity dev't program for BALAs	- 4 capacity development/ trainings conducted for new BALAs - Retooling/ refresher for existing 1,242 BALAs	Province wide	Province wide	Province wide			PGBh-OPV, MLGU, ATI	1 M	1 M	1 M	PGBh-OPV, ATI, MLGU		1
	LGU/dairy POs to establish incentive system for BALAs	- 47 mun. / dairy POs with policy on provision of BALA incentives	Province wide	Province wide	Province wide			PGBh-OPV, MLGUs, PO/ PG, Coops						4

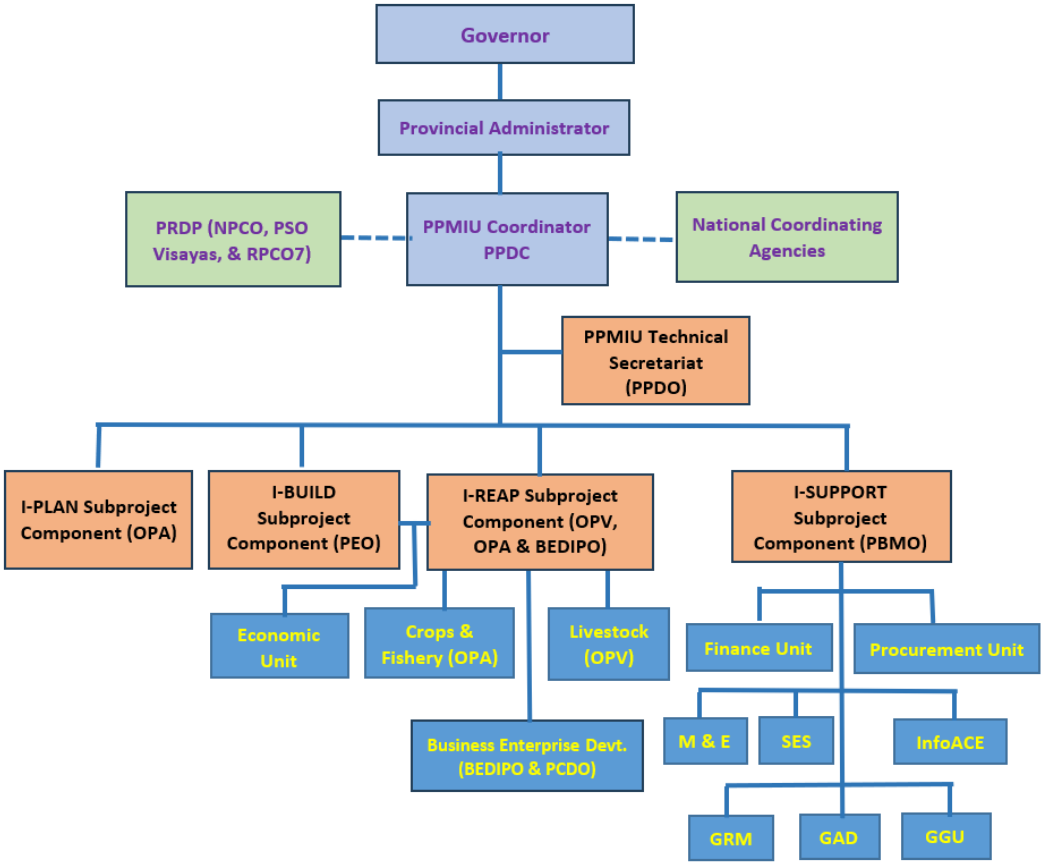
Chapter IV: Institutional Arrangements

Implementation/ Supervision

The implementation and supervision of the Philippine Rural Development Program (PRDP) will be under the Provincial Governor thru the Provincial Program Management and Implementing Unit (PPMIU) created thru EO. No. 05 Series of 2014 and revised thru EO. No. 48 Series of 2024, with the Provincial Planning and Development Coordinator as the overall head. The PPMIU will be responsible for implementing all sub-projects, including but not limited to the preparation of pertinent documents as required by the program. The Regional Program Coordinating Office (RPCO) headed by the Regional Executive Director of the Department of Agriculture (DA) shall provide technical assistance in implementing the various projects.

Organization and Management

The organization and management of the program will be handled by the province through the PPMIU, following a structured hierarchy to ensure efficient implementation of the program. Under the leadership of the Governor and the Provincial Administrator, the PPMIU Coordinator oversees key components: I-PLAN, I-BUILD, I-REAP, and I-SUPPORT, each with specialized sub-units catering to planning, infrastructure, enterprise development, and administrative support. Collaboration with national coordinating agencies and PRDP offices ensures alignment with broader development goals. The inclusion of monitoring and evaluation, social and environmental safeguards, and advocacy units highlights the program's commitment to sustainability, transparency, and inclusive growth. The Bohol PRDP- PPMIU organizational structure is shown below.



Monitoring and Evaluation

A monitoring and evaluation system for the I-PLAN will be installed using the PRDP Results-Based Monitoring and Evaluation System (RBMES), to track the implementation of projects indicated in the plan as well as projects being implemented and completed. Based on the PRDP Results-Based Monitoring, the indicators, means of verification of results and means of data collection are to be adopted. The use of geo-tagging tool/system is to be used in the pre-implementation, implementation and post- implementation of the projects funded under the PRDP. The PPMIU M&E Sub-Unit shall have the following functions:

1) Oversee monitoring and evaluation of the I-REAP and I-BUILD components in the province;
2) Coordinate all M&E activities of the participating LGUs;
3) Implement and Maintain Program Monitoring Information System ensuring that system's problems are immediately attended to or reported to RPCO thru the PRMIU;
4) Identify problems and issues which impeded program implementation for remedial actions by the PPMIU;
5) Generate and submit the prescribed provincial reports based on the LGU's reports to PPMIU for submission to RPCO;
6) Ensure that all completed data capture forms and file copies of the provincial consolidation reports are properly kept for ready reference;
7) Validate submitted reports by participating LGUs;
8) Provide technical assistance to participating LGUs pertaining to M&E system;
9) Prepare and submit reports to the RPCO.

Social and Environmental Safeguards

The province will observe safeguard policies set by the World Bank and the Philippine Government as described in the Social and Environmental Safeguards (SES) Framework of the PRDP.

Social safeguards will be governed by the Indigenous People Development Framework, Land/ Right of Way (ROW) Acquisition and Resettlement Policy Framework. Environmental Safeguards will be governed by the Philippine Environment Impact Statement System and will adopt the Environmental Framework and Guidelines set for by the program.

The SES Sub-Unit of the PPMIU shall carry out environmental guidelines, prepare and implement environmental management plan, resettlement action plan and indigenous people development framework in a manner and substance satisfactory to the World Bank.

Chapter V: PDC Resolution Approving the Buffalo Dairy PCIP

Republic of the Philippines
PROVINCE OF BOHOL
City of Tagbilaran

Behold... BOHOL

PROVINCIAL DEVELOPMENT COUNCIL

EXCERPT FROM THE MINUTES OF THE MEETING OF THE PROVINCIAL DEVELOPMENT COUNCIL (EXECUTIVE COMMITTEE) HELD ON SEPTEMBER 8, 2017 AT THE GOVERNOR'S MANSION, TAGBILARAN CITY, BOHOL, PHILIPPINES.

In Attendance:

Gov. Edgar M. Chatto.....Chairman, Presiding Officer

and

Majority of the Members of the PDC Executive Committee

PDC EXECOM RESOLUTION NO. 58-2017

A RESOLUTION APPROVING THE PROVINCIAL COMMODITY INVESTMENT PLAN (PCIP) FOR BUFFALO DAIRY OF THE PROVINCE OF BOHOL AND FAVORABLY ENDORSING THE SAME TO THE CENTRAL VISAYAS REGIONAL DEVELOPMENT COUNCIL (RDC-VII) FOR INCLUSION IN THE REGIONAL DEVELOPMENT INVESTMENT PROGRAM (RDIP) AND THE DEPARTMENT OF AGRICULTURE (DA) AND OTHER RELEVANT AGENCIES FOR SUPPORT AND FUNDING ASSISTANCE

WHEREAS, the Province of Bohol has identified the buffalo dairy as one of the 10 priority commodities that will be accorded attention under the Philippine Rural Development Project (PRDP) of the Department of Agriculture (DA);

WHEREAS, being one of the identified commodities that are important to agricultural development of the province, a value chain analysis and a Provincial Commodity Investment Plan (PCIP) for buffalo dairy have been undertaken and prepared as part of the necessary requisites to ensure effective interventions;

WHEREAS, the PCIP for buffalo dairy is a strategic plan that rationalizes the interventions within the various segments of the value chain of the commodity, which shall become the basis for PRDPs I-BUILD and I-REAP in selecting eligible interventions/ sub-projects for funding and eventual actual implementation in the province of Bohol;

WHEREAS, the PCIP for buffalo dairy is a 3-year rolling consensus plan between the DA and Provincial Government of Bohol based on the value chain analysis, which was conducted with strong participation of the various stakeholders in the chain;

WHEREAS, the Provincial Core Planning Team (PCPT) presented the PCIP to this Body, giving emphasis on relevant information, gaps and constraints, and needed interventions, which has been identified through a technical review and a stakeholders' consultation involving suppliers, growers, processors, traders, municipal agriculturists, provincial and regional commodity coordinators, and other key players in the buffalo dairy industry;

WHEREAS, the PCIP for buffalo dairy, after review and deliberation, has been found by this Body to be relevant, well-grounded, responsive, and aligned with the provincial goals and priorities, and can contribute to the regional and national agriculture goals and for these reasons, worthy of its approval and endorsement to the Regional Development Council, Department of Agriculture and other relevant agencies for support;

WHEREFORE, upon proper motion duly seconded, be it resolved by this Body in a meeting duly convened –

To approve the Provincial Commodity Investment Plan (PCIP) for Buffalo Dairy of the Province of Bohol and favorably endorsing the same to the Central Visayas Regional Development Council (RDC-VII) for inclusion in the Regional Development Investment Program (RDIP) and to the Department of Agriculture (DA) and other relevant agencies for support and funding assistance

RESOLVED FURTHER, to provide copies of this resolution to the DA, and other proper government agencies for support and subsequent endorsement and funding assistance.

UNANIMOUSLY ADOPTED.

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I hereby certify to the correctness of the foregoing Resolution.

JOHN TITUS J. VISTAL
PPDC-Bohol
Head, PDC Secretariat

APPROVED:

EDGARDO M. CHATTO
Governor
Chairman, PDC-Bohol

- **PDC ExeCom Resolution No. 57-2024 Endorsing the Updated Provincial Commodity Investment Plan with Climate Change Adaptation Programs and Projects**

Republic of the Philippines
PROVINCE OF BOHOL
City of Tagbilaran

PROVINCIAL DEVELOPMENT COUNCIL

EXCERPT FROM THE MINUTES OF THE MEETING OF THE PROVINCIAL DEVELOPMENT COUNCIL EXECUTIVE COMMITTEE (EXECOM) HELD ON JULY 19, 2024 AT THE CAMBANGAY CONFERENCE ROOM, PROVINCIAL PLANNING AND DEVELOPMENT OFFICE, PROVINCIAL CAPITOL, LINO CHATTO DRIVE, COGON DISTRICT, TAGBILARAN CITY, BOHOL, PHILIPPINES

In Attendance:

Acting Gov. Tita V. Baja .....Chairman, Presiding Officer
and
Majority of the Members of the PDC Executive Committee

PDC EXECOM RESOLUTION NO. 57-2024

A RESOLUTION FAVORABLY ENDORSING THE UPDATED PROVINCIAL COMMODITY INVESTMENT PLAN (PCIP) WITH CLIMATE CHANGE ADAPTATION PROGRAMS AND PROJECTS (PAPS) FOR THE DEPARTMENT OF AGRICULTURE - PHILIPPINE RURAL DEVELOPMENT PROJECT (DA PRDP) SCALE-UP FUNDING SUPPORT

WHEREAS, the Department of Agriculture – Philippine Rural Development Project Scale-Up (DA PRDP Scale-Up) is a World Bank-supported project designed to address gaps in value chains, climate resilience, and a more modernized agri-fishery sector;

WHEREAS, the Provincial Commodity Investment Plan (PCIP) is a 3-year rolling consensus plan reflecting agreements between DA and PLGUs with strong participation of the various stakeholders which rationalizes the upgrading strategies and interventions within the various segments of the value chain of commodities prioritized by the province including emergent commodities, and will contribute to the goals of the agriculture and fishery sector;

WHEREAS, the interim approach in updating the PCIP for PRDP Scale-Up implementation focuses on the integration of Climate Risk Vulnerability, particularly the incorporation of Major Climate Risks and Risk Adaptation Measures in the existing PCIP Matrices for the identified priority commodities of Bohol;

WHEREAS, after review and deliberation, the Updated Provincial Commodity Investment Plan (PCIP) with Climate Change Adaptation Programs and Projects (PAPs), has been found by this Body to be aligned with Bohol's strategic change agenda for a climate-smart agriculture and is supportive to the attainment of Bohol's development goals and objectives towards agricultural productivity through improvement of climate change resilient agricultural infrastructure, and is consistent with the Comprehensive Land Use Plans (CLUPs) of all concerned municipalities, and on

top of all this, is consistent as well with the Provincial Development and Physical Framework Plan (PDPFP) of the Provincial Government of Bohol; and therefore, worthy of support and endorsement for Department of Agriculture - Philippine Rural Development Project (DA-PRDP) Scale-Up;

WHEREFORE, upon proper motion duly seconded, be it resolved by this Body in a meeting duly convened –

to favorably endorse the Updated Provincial Commodity Investment Plan (PCIP) with Climate Change Adaptation Programs and Projects (PAPs) for the Department of Agriculture - Philippine Rural Development Project (DA-PRDP) Scale-Up funding support.

RESOLVED FURTHER, to furnish a copy of the same Resolution to the Department of Agriculture Regional Office-7, for appropriate action.

UNANIMOUSLY ADOPTED.

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I hereby certify to the correctness of the foregoing Resolution.

MARIA IMELDA R. BORROMEO
OIC - PPDO Bohol
Head, PDC Secretariat

APPROVED:

TITA V. BAJA
Acting-Governor
Chairman, PDC-Bohol

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ANNEXES

Annex A. Farm-to-Market Roads (FMR) for Buffalo Dairy PCIP

Annex B. Directory of Farmer Organizations Engaged in Bohol Buffalo Dairy

Annex C. Directory of Bohol Buffalo Dairy Players

Annex D. List of Schools Supplied by BoDPA

Annex E. Summary of Potential Dairy Buffalos for Recuitment

Annex F. Summary of Risk Profile of Municipalities

Annex G. Risk Profile of Commodity per Municipality

Annex H. Provincial Core Planning Team (PCPT) Composition

Annex A. Farm-to-Market Roads (FMR) for Buffalo Dairy PCIP, Province of Bohol

	Name of Roads	Length	Total Cost
1	**Ubay**		
	San Miguel-Bayongan-Bulilis-Mabuhay(Ubay) Road	17.50	348,000,000.00
	Jct.(Soom)-Humay-Humay Road	3.31	66,100,000.00
	Road to Ubay Jr. High School	0.40	8,000,000.00
	Gabi Seed Farm, Ubay	1.01	20,200,000.00
	Road to Ubay Stock Farm	1.60	32,000,000.00
	Jct.(TER)-San Pascual (Ubay)-Mahayag (San Miguel) Road	2.59	49,400,000.00
	Jct.(TER)-Ilihan-Cabulao Road	1.90	38,000,000.00
	Brgy. Roads	20.00	400,000,000.00
2	**Mabini**		
	Cabulao-Ondol(Mabini)-Union(Ubay) Road	20.90	40,000,000.00
	Kaporsing-Abaca-San Roque Road, Mabini	6.92	136,000,000.00
	Jct.(Mabini-Cabulao)-Aguipo Road	1.10	20,000,000.00
	Jct.(TER) - Ilihan - Cabulao Road	5.16	103,200,000.00
	Jct.(TER)-Mabini-Cabulao-Lungsodaan-Pook Road	17.17	70,000,000.00
	Sta. Cruz-Minol-Banlas-Tambo Road	6.95	132,000,000.00
	Brgy. Roads	20.00	400,000,000.00
3	**Alicia**		
	Pob. -Putlongcam - Mahayag FMR	7.00	140,000,000.00
	Napo - Putlongcam FMR	3.00	60,000,000.00
	Pob. - Untaga via Carangi FMR	4.00	80,000,000.00
	Pob. - Sudlon-Cagongcagong via Matin-ao FMR	8.00	160,000,000.00
	Jct.(LIR)-Mahayag-Katipunan Road	10.55	208,200,000.00
	Brgy. Roads	20.00	400,000,000.00
4	**Dagohoy**		
	Road to Palayan ng Bayan, Dagohoy	8.51	170,100,000.00
	Road to Dagohoy Reforestation	1.02	20,400,000.00
	Dagohoy-Caluasan Road	7.05	141,000,000.00
	Jct.(LIR)-Mahayag-Katipunan Road	10.55	208,200,000.00
	Brgy. Roads	20.00	400,000,000.00
5	**San Miguel**		
	Jct.(TER)-San Pascual (Ubay)-Mahayag (San Miguel) Road	2.59	49,400,000.00
	San Miguel-Tomoc-Getafe Road (San Miguel Side)	8.71	169,400,000.00
	San Miguel-Bayongan-Bulilis-Mabuhay(Ubay) Rd	17.50	348,000,000.00
	Cambangay (San Miguel)-Soom(Trinidad) Road	7.10	142,000,000.00
	Brgy. Roads	20.00	400,000,000.00
TOTAL		**282.07**	**4,959,600,000.00**

Annex B. Directory of Farmer Organizations Engaged in Bohol Buffalo Dairy

NAME OF COOPERATIVE/ ASSOCIATION/ CLUSTER	MEMBERSHIP			ADDRESS	CHAIRMAN/ PRESIDENT	CONTACT NO.
	MALE	FEMALE	TOTAL			
1) Tamboan Farmers Multipurpose Cooperative	8	22	30	Tamboan, Carmen, Bohol	Jesusa Danila	9087520433
2) Progreso Womens and Workers Multipurpose Cooperative	17	46	63	Progreso, Alicia, Bohol	Monica Huiso	9074397785
3) Untaga Multi-Purpose Cooperative	8	25	33	Untaga, Alicia, Bohol	Shirley Molina	9981703179
4) Biabas Small Farmers & Dairy Association	10	6	16	Biabas, Ubay, Bohol	Ma. Victoria Marvida	9269269720
5) Riceland Paradise Multipurpose Cooperative	40	31	71	Benliw, Ubay, Bohol	Gaudencio Lagura	9056570495
6) Ubay Northwestern Dairy Breeders Association	22	16	38	Tuboran, Ubay, Bohol	Efren Raña	9994203539
7) Ubay Northeastern Dairy Breeders Association	13	20	33	San Vicente, Ubay, Bohol	Fernando Dupalco	9362654277
8) Katipunan Farmers' Association	12	23	35	Katipunan, Alicia, Bohol	Rosa Matin-ao	9071839021
9) San Miguel Dairy Breeders Association	18	12	30	Poblacion, San Miguel, Bohol	Jovino Nuez	9207973761
10) San Pascual Dairy Breeders Association	1	29	30	San Pascual, Ubay, Bohol	Virgilia Cutamora	9351651791
11) Bugang Farmers Association	8	14	22	Bugang, San Miguel, Bohol	Lita Aranas	9098552776
12) San Jose Dairy Buffalo Producers Association	24	7	31	San Jose, Mabini, Bohol	Grace Boyles	9057370825
13) Village Dairy Farmers Association	7	3	10	Candelaria, Dagohoy, Bohol	Alma Tusoy	9098990069
14) Malitbog Agrarian Reform Farmers Beneficiaries Cooperative	4	18	22	Malitbog, Dagohoy, Bohol	Jovita Gaudicos	9122605264
15) La Hacienda People's Organization	8		8	La Hacienda, Alicia, Bohol	Diodoro Platino	N/A
16) Union Carabao Raiser's Association	3	1	4	Union, Ubay, Bohol	Elpidio Boiser	9368065979
17) Cayacay Dairy Breeders Association	4	1	5	Cayacay,Alicia, Bohol	Annie Bual	N/A
18) Del Monte Dairy Breeders Association	2		2	Del Monte, Alicia, Bohol	Rogelio Ranili	9103514328
19) Putlongcam Dairy Breeders Association	3		3	Putlongcam, Alicia, Bohol	Kag. Marlino Mendez	N/A
20) San Roque Lungsodaan- Farmers and Fishermen Multi- purpose Cooperative	6		6	San Roque, Mabini, Bohol	N/A	N/A
21) Katarungan Small Coconut Farmers Multipurpose Cooperative	4		4	Katarungan, Ubay, Bohol	Jose Valleser	9066271648
22) Cambaol Farmers Multipurpose Cooperative	1		1	Cambaol,Alicia, Bohol	Golosino	9165802575
23) Mahayag Dairy Breeders Association	7		7	Mahayag, Alicia, Bohol	Epenito Wahig	
TOTAL >>	**230**	**274**	**504**			

Annex C. Directory of Bohol Buffalo Dairy Players

Name	Address	Contact Person	Contact Number	Value Chain Role
1) VANILLA SKY	Panglao, Bohol	Sandro	O9301364743	Processor/ institutional buyer of raw milk
2) BOHOL BEE FARM	Panglao, Bohol	Vicky Wallace	O9173041491 O9177101062 O9399046796	Processor/ institutional buyer of raw milk and homogenized milk
3) INABANGA COCONUT FARMERS ASSOCIATION	Baogo, Inabanga, Bohol	GAVINO JEMIDA	O9098516037	Processor/ farmer raw milk producer
4) SAN MIGUEL DAIRY FARMERS ASSOCIATION	Poblacion, San Miguel, Bohol	Joveno Nuez	O9207973761	Processor/ farmer raw milk producer
5) KATIPUNAN ESCAYA FARMERS ASSOCIATION	Katipunan, Alicia, Bohol	Rosa Matin-ao	O9071839021	Processor/ farmer dairy producer
6) RICELAND PARADISE MULTIPURPOSE COOPERATIVE	Benliw, Ubay, Bohol	Diomedes Boyles, Gaudencio Lagura	O9361820002 O9056570495	Farmer/ dairy producer, Processor
7) UBAY NORTHWESTERN Breeders Association	Tuburan, Ubay Bohol	Efren Rania	O9104830192	Farmer raw milk producer, Processor
8) ADFAT Restaurant	Tubigon, Bohol	Ms. Maureen	O9293968595	Retailer
9) AMARELA Resort	Panglao, Bohol	Atty. Nunag	O9177747200	Retailer
10) ALUMBONG	Panglao, Bohol	N/A	N/A	Retailer
11) BOHOL BEACH CLUB	**Panglao, Bohol**	N/A	N/A	Retailer
12) GUISSEPPE	Panglao, Bohol	N/A	N/A	Retailer
13) RONDOVIO CAFÉ	Panglao, Bohol	Vanessa Rondovio	O9499228807	Retailer
14) AMORITA	Panglao, Bohol	N/A	N/A	Retailer
15) ALFRESCO BAY	Panglao, Bohol	N/A	O9295863148	Retailer
16) Alicia Technical Vocational High School	Alicia, Bohol	Sheriemae Cuyad	O9120220104 O9467454938	Retailer
17) Sierra Bullones Technical Vocational High School	Sierra Bullones, Bohol	N/A	O9207093766	Retailer
18) Guinsularan High School	Duero, Bohol	Rovelia Achacoso	O9301541059	Retailer
19) SCE/S	Sierra Bullones, Bohol	N/A	O8293791149	Retailer
20) Tamboan Farmers Multipurpose Cooperative	Tamboan, Carmen, Bohol	Jesusa Danila	O9087520433	Farmer raw milk producer
21) Progreso Women's and Workers Multi-purpose Cooperative	Progreso, Alicia, Bohol	Monica Huiso	O9074397785	Farmer raw milk producer
22) Untaga Multi-Purpose Cooperative	Untaga, Alicia, Bohol	Shirley Molina	O9981703179	Farmer raw milk producer
23) Biabas Small Farmers & Dairy Association	Biabas, Ubay, Bohol	Ma. Victoria Marvida	O9269269720	Farmer raw milk producer
24) Bohol Dairy Producers Association	Lumangog, Ubay, Bohol	Shirley Molina Esterlyn Cotillas	O9056570495 O9164762509	Processor/ milk assembler
25) Ubay Northeastern Dairy Breeders Association	San Vicente, Ubay, Bohol	Fernando Dupalco	O9362654277	Farmer raw milk producer
26) San Pascual Dairy Breeders Association	San Pascual, Ubay, Bohol	Virgilia Cutamora	O9351651791	Farmer raw milk producer
27) Bugang Farmers Association	Bugang, San Miguel, Bohol	Lita Aranas	O9098552776	Farmer raw milk producer
28) San Jose Dairy Buffalo Producers Association	San Jose, Mabini, Bohol	Grace Boyles	O9057370825	Farmer raw milk producer
29) Village Dairy Farmers Association	Candelaria, Dagohoy, Bohol	Alma Tusoy	O9098990069	Farmer raw milk producer
30) Malitbog Agrarian Reform Farmers Beneficiaries Cooperative	Malitbog, Dagohoy, Bohol	Jovita Gaudicos	O9122605264	Farmer raw milk producer
31) La Hacienda People's Organization	La Hacienda, Alicia, Bohol	Diodoro Platino	N/A	Processor/ farmer raw milk producer

Name	Address	Contact Person	Contact Number	Value Chain Role
32) Union Carabao Raiser's Association	Union, Ubay, Bohol	Elpidio Boiser	O9368065979	Farmer raw milk producer
33) Cayacay Dairy Breeders Association	Cayacay,Alicia, Bohol	Annie Bual	N/A	Farmer raw milk producer
34) Del Monte Dairy Breeders Association	Del Monte, Alicia, Bohol	Rogelio Ranili	O9103514328	Farmer raw milk producer
35) Putlongcam Dairy Breeders Association	Putlongcam, Alicia, Bohol	Marlino Mendez	N/A	Farmer raw milk producer
36) San Roque Lungsodaan Farmers and Fishermen Multi-purpose Cooperative	San Roque, Mabini, Bohol	N/A	N/A	Farmer raw milk producer
37) Katarungan Small Coconut Farmers Multi-purpose Cooperative	Katarungan, Ubay, Bohol	Jose Valleser	O9066271648	Farmer raw milk producer
38) Cambaol Farmers Multi-purpose Cooperative	Cambaol,Alicia, Bohol	Mr. Golosino	O9165802575	Farmer raw milk producer
39) Mahayag Dairy Breeders Association	Mahayag, Alicia, Bohol	Epenito Wahig	N/A	Farmer raw milk producer
40) Inabanga Coconut Farmers Association	Baogo, Inabanga, Bohol	Gavino Jemida	O9098516037	Processor/ raw milk producer
41) DA-Ubay Stock Farm	Lumangog, Ubay, Bohol	Marianito Doydora	O9778478811	Enabler
42) Philippine Carabao Center-Ubay Stock Farm	Lumangog, Ubay, Bohol	Guillerma Abay-abay	O9296729433	Enabler
43) Office of the Provincial Veterinarian	Tagbilaran, Bohol	Aida R. Sumampong Daisy A. Basco	O9306839989 O9202406393	Enabler
44) LGU-UBAY (MAO)	Ubay, Bohol	Nena B. Alangilan	O9261832971	Enabler
45) LGU-ALICIA (MAO)	Alicia, Bohol	Mansueta Mangayaay	O9303944112	Enabler
46) LGU-SAN MIGUEL (MAO)	San Miguel, Bohol	Jessienen Pacomios	O9093386246	Enabler
47) LGU-DAGOHOY (MAO)	Dagohoy, Bohol	Peter I. Calamba	O9061796360	Enabler
48) LGU-MABINI (MAO)	Mabini, Bohol	Norman H. Miano	O9261212316	Enabler
49) PLGU-BOHOL	Tagbilaran, Bohol	Ma. Imelda Borromeo	O9202517389	Enabler
50) BLUESKY	Panglao, Bohol	Santiago Fonacier	O9423038140	Retailer

Annex D. List of Schools Supplied by BoDPA

NAME OF SCHOOL	ADDRESS	YEAR STARTED	ESTIMATED MILK SUPPLY MONTHLY REQUIREMENT		
			Milkbar 65 ml (in pcs)	Flavored Milk (in liters)	Pasteurized Fresh Milk (in liters)
1) Alicia Technical Vocational High School	Alicia, Bohol	2011	800	65	
2) La Hacienda National High School	Alicia, Bohol	2011	1,200	40	45
3) San Jose National High School	Talibon, Bohol	2011	8,000	60	7
4) San Miguel Technical Vocational High School	San Miguel, Bohol	2011	6,800	90	7
5) San Roque National High School	Alburquerque, Bohol	2011	2,800	12	
6) Sierra Bullones Technical Vocational High School	Sierra Bullones, Bohol	2012	8,000		
7) Mahayag National High School	San Miguel, Bohol	2012	6,800	60	6

NAME OF SCHOOL	ADDRESS	YEAR STARTED	ESTIMATED MILK SUPPLY MONTHLY REQUIREMENT		
			Milkbar 65 ml (in pcs)	Flavored Milk (in liters)	Pasteurized Fresh Milk (in liters)
8) Faraon National High School	Jagna, Bohol	2012	2,000	30	20
9) Candijay Central Elementary School	Candijay, Bohol	2012	2,800	80	20
10) Guinsularan National High School	Duero, Bohol	2012	2,000	20	7
11) Tubigon West Central Elementary School	Tubigon, Bohol	2012	1,500	20	
12) Getafe Central Elementary School	Getafe, Bohol	2012	2,000	90	
13) Guindulman Central Elementary School	Guindulman, Bohol	2012	3,500	120	2
14) Cangawa National High School	Buenavista, Bohol	2012	1,000	20	
15) Inabanga National High School	Inabanga, Bohol	2012	2,500	15	5
16) Antequera Central Elementary School	Antequera, Bohol	2012	400	13	5
17) Lila National High School	Lila, Bohol	2012	3,100	10	5
18) Campao Oriental High School	Getafe, Bohol	2012	1,500	15	
19) Bugang National High School	San Miguel, Bohol	2012	500		
20) Nahawan National High School	Clarin, Bohol	2012	1,500	20	
21) Cong. Pablo Malasarte National High School	Balilihan, Bohol	2012	1,500	20	
22) Guinacot National High School	Guindulman, Bohol	2013	6,000		
23) Batuan Central Elementary School	Batuan, Bohol	2013	500	10	
24) Biabas Central Elementary School	Ubay, Bohol	2013	4,000	50	5
25) Candabong National High School	Anda, Bohol	2014	2,000	25	3
TOTAL			**86,700**	**970**	**140**

NOTES:
Estimated supply requirements per school are based on deliveries.
** Milkbar 65ml comprised about 23% milk*
** Flavored milk per liter comprised 50% milk*
** Pasteurized fresh milk contained 100% pure milk*

Annex E. Summary of Potential Dairy Buffalos for Recruitment

Municipality	No. of Animals (By Breed)				No. of Milking Animals from 2011 - 2014				No. of Potential Dairy Animals			
	SP	CB	RV	TOTAL	SP	CB	RV	TOTAL	SP	CB	RV	TOTAL
Alicia	336	150	0	**486**	7	11	0	18	329	139	0	468
Dagohoy	244	164	0	**408**	7			7	237	164	0	401
Mabini	543	265	133	**941**	28	45	26	99	515	220	107	842
Pilar	116	43	5	**164**	6	4	1	11	110	39	4	153
San Miguel	284	98	0	**382**	17	14	0	31	267	84	0	351
Ubay	754	749	215	**1,718**	50	91	23	164	704	658	192	1,554
Inabanga	161	54	0	**215**	8			8	153	54	0	207
Other Areas						8	6	12				
TOTAL	**2,438**	**1,523**	**353**	**4,314**	**123**	**173**	**56**	**350**	**2,315**	**1,358**	**303**	**3,976**

Annex F. Summary of Risk Profile of Municipalities

	Indicators									Adaptive Capacity						
	Over-All Hazards	Tropical Cyclone	Flood	Erosion	Land Slide	Drought	Sea Level Rise	Storm Surge	Salt Water Intrusion	Econo Mic *	Natural *	Social *	Human *	Instituti-onal *	Physical *	Anticipa-tory Capitals *
Albuquerque	Low	Very Low	Low	Very High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Moderate	Very Low	Low	Moderate	Low
Alicia	High	High	Low	High	Low	Low	Very Low	Very Low	Very Low	Very Low	Low	Moderate	Low	High	Very Low	High
Anda	Moderate	High	Very Low	High	High	Very Low	Very Low	Very Low	Very Low	Very Low	Very High	Low	Very Low	Low	Moderate	Moderate
Antiquera	Low	Very Low	Very Low	High	Moderate	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very High	Very Low	Moderate	High	Moderate
Baclayon	Very Low	Very Low	Very Low	High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very High	Low	Moderate	Very Low	Very Low
Balilihan	Low	Very Low	Very Low	High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Very High	Very Low	Moderate	Very High	Moderate
Batuan	Low	Very Low	Very Low	Moderate	High	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Low	Moderate	Very Low	Moderate
Bilar	Low	Very Low	Very Low	High	Very High	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low	Very Low	Moderate	Low	High
Buen Unido	Very High	Very High	High	Very Low	Very Low	Ver High	Very Low	Moderate	High	Low	High	Moderate	Very Low	High	Moderate	High
Buenavista	Very High	Very High	Low	Very High	Low	High	Low	Low	Very Low	Very Low	Low	Moderate	Very Low	Moderate	Very Low	Moderate
Calape	Moderate	Very Low	Moderate	Moderate	Moderate	Very Low	Moderate	Moderate	Very Low	Very Low	Moderate	Moderate	Low	High	Low	High
Candijay	Very High	High	Very High	Moderate	Low	Very Low	Moderate	Moderate	Very Low	Very Low	Very High	Low	Low	Low	Moderate	High
Carmen	Low	Low	Very Low	High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Moderate	Low	Moderate	Low	Moderate
Catigbian	Very Low	Very Low	Very Low	Moderate	Moderate	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very High	Low	Moderate	Moderate	Moderate
Clarin	Very Low	Low	Very Low	Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very High	Low	Very Low
Corella	Very Low	Very Low	Very Low	High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	High	Low	Moderate	Very High	High
Cortes	Low	Very Low	High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low	Very Low	Moderate	Low	High

	Indicators									Adaptive Capacity						
	Over-All Hazards	Tropical Cyclone	Flood	Erosion	Land Slide	Drought	Sea Level Rise	Storm Surge	Salt Water Intrusion	Econo Mic *	Natural *	Social *	Human *	Instituti-onal *	Physical *	Anticipa-tory Capitals *
CP Garcia	Very High	Very High	Very High	Low	Very Low	Very High	Very High	Moderate	Very Low	Low	Moderate	High	Low	Moderate	High	Moderate
Dagohoy	High	Moderate	Moderate	High	Low	Low	Very Low	Very Low	Very Low	Very Low	High	High	Very Low	High	Very High	High
Danao	High	High	Low	Very High	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	Low	High	Very Low	High	Low	High
Dauis	Very Low	Very Low	Very Low	Very High	Very Low	Very Low	Very Low	Very Low	Very High	Low	Low	Low	Low	High	High	Moderate
Dimao	Low	Very Low	Very Low	Very High	Moderae	Very Low	Very Low	Very Low	Very Low	Very Low	Low	Low	Very Low	Low	Low	Moderate
Duero	Low	Low	Very Low	Very High	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	High	Moderate	Low	Moderate	Very High	Low
Garcia Hernandez	Low	Very Low	Very Low	High	High	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Very High	Low	High	Moderate	Loe
Getafe	Very High	Very High	Very Low	Moderate	Very Low	High	High	High	Very Low	Very Low	Moderate	Very Low	Very Low	Very Low	Moderate	Moderate
Guindulman	Moderate	Moderate	Low	High	High	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very High	Low	High	High	Moderate
Inabanga	High	Moderate	Very High	Low	Very Low	Very Low	Moderate	Moderate	Very Low	Low	Very High	Moderate	Low	High	Very Low	High
Jagna	Low	Very Low	Very Low	Very High	High	Very Low	Very Low	Very Low	Very Low	Low	Low	High	Very Low	Moderate	High	Moderate
Lila	Low	Very Low	Low	Very High	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	Very High	Very High	Very Low	Very High	Very High	High
Loay	Moderate	Very Low	Very High	Moderate	Moderate	Very High	Very Low	Very Low	Very Low	Very Low	Moderate	Very High	Very Low	High	High	Moderate
Loboc	Moderate	Very Low	Moderate	Very High	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Moderate	Low	Moderate	High	High
Loon	Low	Very Low	Low	Moderate	Moderate	Very Low	Very Low	Very Low	Very Low	Low	Low	Very High	Low	High	Moderate	High
Mabini	High	Very High	Moderate	High	Low	Very Low	Low	Low	Very Low	Very Low	Low	High	Low	Moderate	High	High
Maribojoc	Low	Very Low	Low	Moderate	Moderate	Very Low	Very Low	Very Low	Very Low	Low	Very High	Moderate	Low	High	High	High
Panglao	Very Low	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very High	Low	Low	Low	Low	High	Moderate	High
Pilar	Low	Moderate	Very Low	Moderate	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very High	High	Very Low	Low	Moderate	High

	Indicators									Adaptive Capacity						
	Over-All Hazards	**Tropical Cyclone**	**Flood**	**Erosion**	**Land Slide**	**Drought**	**Sea Level Rise**	**Storm Surge**	**Salt Water Intrusion**	**Econo Mic ***	**Natural ***	**Social ***	**Human ***	**Instituti-onal ***	**Physical ***	**Anticipa-tory Capitals ***
Sagbayan	Low	Low	Very Low	High	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Very Low	Low	Moderate	Moderate
San Isidro	Low	Very Low	Very Low	Very High	Very High	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very High	Vey Low	Moderate	Low	High
San Miguel	Moderate	Very High	Moderate	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	High	Moderate	Very Low	Moderate	High	High
Sevilla	Low	Very Low	Low	High	Moderate	Very Low	Very Low	Very Low	Very Low	Low	Very Low	Very High	Low	Moderate	Moderate	Moderate
Sierra Bullones	Low	Very Low	Very Low	High	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Moderate	Very Low	Moderate	Moderate	Low
Sikatuna	Low	Very Low	Very Low	Very High	Moderate	Very Low	Very Low	Very Low	Very Low	Very Low	Very Low	Moderate	Low	High	High	High
Tagbilaran	Very Low	Very Low	Very Low	Low	Very Low	Very Low	Very Low	Very Low	Very Low	Very High	Moderate	Low	Very High	Very High	Low	High
Talibon	Very High	Very High	Low	Moderate	Very Low	Very Low	Moderate	High	Moderate	Low	High	High	Low	High	Low	Moderate
Trinindad	Very High	Very High	Very High	Moderate	Very Low	Very Low	Very Low	Very Low	Very High	Very Low	Very Low	Very Low	Low	Moderate	Low	Moderate
Tubigon	Low	Very Low	Very Low	Moderate	Low	Very Low	Moderate	Low	Very Low	Low	Very High	Very High	Low	Moderate	Moderate	High
Ubay	Very High	Very High	High	Low	Very Low	Very Low	Very Low	Very High	Moderate	Moderate	Moderate	Moderate	Moderate	High	Very High	Very High
Valencia	Low	Very Low	Very Low	Very High	High	Very Low	Very Low	Very Low	Very Low	Low	Moderate	Very High	Very Low	Moderate	High	High

** Source: Bohol, Negros Oriental and Siquijor CRVA Completion Report*

*** Source: Bohol LDRRM Plan*

**** Based on location of Major Dams*

Annex G. Risk Profile of Commodity per Municipality

Municipality	Inventory of Dairy Carabao	Key Hazards	Adaptive Capacity (AC)
Ubay	1,863	**Very High -** Tropical Cyclone **High** - Drought, Storm Surge **Moderate -** Salt water Intrusion	**Moderate -** Economic, Natural, Social, Human **High -** Institutional **Very High -** Physical, Anticipatory
Alicia	163	**High -** Tropical Cyclone, Flood, Erosion, Landslide (Earthquake Induced)	**Very Low -** Economic Physical **Low -** Natural, Human **Moderate -** Social, **High -** Institutional, Anticipatory
Mabini	496	**Very High -** Tropical Cyclone **High -** Flood, Erosion, Drought, Storm Surge	**Very Low -** Economic **Low** - Natural, Human **Moderate -** Institutional **High -** Social, Physical, Anticipatory
San Miguel	149	**Very High -** Tropical Cyclone **High -** Drought	**Very Low -** Economic, Human **Moderate -** Social, Institutional **High -** Natural, Physical, Anticipatory
Pilar	87	**High** - Flood, Landslide (Earthquake Induced), Drought	**Very Low -** Economic, Human **Low -** Institutional **Moderate -** Physical **High -** Social, Anticipatory **Very High -** Natural
Dagohoy	20	**High -** Erosion	**Very Low -** Economic, Human **High -** Natural, Social, Institutional, Anticipatory **Very High -** Physical
CPGarcia	98	**Very High -** Tropical Cyclone, Sea Level Rise **High -** Storm Surge	**Very Low -** Economic **Low -** Natural, Human, Physical **Moderate -** Social, Institutional, Anticipatory
Panglao		**Very High -** Salt Water Intrusion **High -** Storm Surge	**Low -** Economic, Natural, Social, Human **Moderate -** Physical **High -** Institutional, Anticipatory
Dauis		**Very High -** Salt water Intrusion	**Low -** Economic, Natural, Social, Human **Moderate -** Anticipatory **High -** Institutional, Physical
Bien Unido		**Very High -** Tropical cyclone **High -** Storm Surge, Salt Water Intrusion	**Very Low -** Social, Human **Low -** Economic, Natural, Physical **Moderate** - Institutional **High** -Anticipatory

** Source: Bohol, Negros Oriental and Siquijor CRVA Completion Report*
*** Source: Bohol LDRRM Plan*
**** Based on location of Major Dams*

Annex H. Provincial Core Planning Team Composition

Provincial Core Planning Team			
Component	**Commodity**	**Agency/Office**	**Name**
I-PLAN Subproject Component			
Component Head		Office of the Provincial Agriculturist (OPA)	OPA/ Dr. Larry M. Pamugas, PhD.
Commodity Experts	Crops	Office of the Provincial Agriculturist (OPA)	Mr. Ramil Rodela
		Department of Agriculture (DA -PATCO)	Mr. Roman Dabalos
		Philippine Coconut Authority (PCA)	Mr. Jovencio Felisilda
	Seaweeds/Fisheries	Office of the Provincial Agriculturist (OPA)	Ms. Queenie Atup
		Bureau of Fisheries and Aquatic Resources (BFAR)	Mr. Candido Samijon
	Livestock	Office of the Provincial Veterinarian	Mr. Ian Ray Tejada Ms. Isabelita Alipoyo
I-BUILD Subproject Component / Engineering		Provincial Engineer's Office (PEO)	Engr. Camilo Gasatan Engr. Evelyn Ayuban
I-REAP Subproject Component		Office of the Provincial Veterinarian	Dr. May Dallyn Paman
Planning		Provincial Planning and Development Office	EnP. Maria Imelda Borromeo Atty. Maria Contessa Butron-Arcaya
ON-CALL			
Environment and Natural Resources			EnP. Jovencia Ganub
Social Welfare and Development/GAD			Ms. Carmelita Tecson
Disaster Management			Dr. Anthony Damalerio
Enterprise			Ms. Gertrudes Fuentes
PAFC Representative			Mr. Apolonio Manatad

PHOTO DOCUMENTATION

Presentation of Buffalo Dairy VCA Results to PDC and PCPT by RPCO-7 | June 27, 2017

Presentation & Technical Review of Buffalo Dairy PCIP Matrix | July 27, 2017

Stakeholders' Consultation for the Buffalo Dairy PCIP | August 9, 2017

PDC Presentation of Buffalo Dairy PCIP | September 8, 2017

PDC ExeCom Presentation of the Updated PCIP Matrices | July 19, 2024