PROVINCIAL DISASTER RISK REDUCTION & MANAGEMENT COUNCIL

PROVINCE OF BOHOL
OFFICIAL SEAL

PROVINCIAL DISASTER RISK REDUCTION and MANAGEMENT PLAN

2020 - 2022

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Republic of the Philippines
PROVINCE OF BOHOL
City of Tagbilaran

OFFICE OF THE GOVERNOR

December 9, 2019

First and foremost, I would like to thank the members of the Provincial Disaster Risk Reduction and Management Council (PDRRMC) of their cohesive and collective efforts in coming up with this revised and updated Provincial Disaster Risk Reduction and Management (PDRRM) Plan for 2020-2022 of the Province of Bohol.

The M7.2 Great Bohol earthquake in 2013 and the succeeding series of typhoons that hit the province of Bohol may be tragic, but somehow it was a wake up call for us and paved the way for us to showcase and strengthen the Boholano spirit of resiliency that allowed us to rise from the rubbles and pushes us to become what we are and to where we are now.

I am now confident that concerns and matters relative to the four thematic areas of disaster management – disaster prevention and mitigation, disaster preparedness, disaster response and disaster rehabilitation and recovery, will be addressed in all aspects considering that numerous agencies of the government also provided their inputs by way enumerating the various PPAs specific for each disaster pillar attuned to the respective goals, obj and outcomes. With this Plan, Bohol now has a roadmap towards disaster resilient communities following its credo to BUILD BACK BOHOL BETTER.

I enjoin all Boholanos and Boholanos-at-heart to work hand in hand and demonstrate the Boholano resilient spirit for cooperation and collaboration so that we can productively and successfully implement this PDRRM Plan.

Good luck and God bless us all!

(Sgd.) ATTY. ARTHUR C. YAP
Governor

Acronyms and Abbreviations

BLGU	Barangay Local Government Unit
CCA	Climate Change Adaptation
CCC	Climate Change Commission
CDRRMC	City Disaster Risk Reduction and Management Council
CHED	Commission on Higher Education
CLUP	Comprehensive Land Use Plan
DA	Department of Agriculture
DANA	Damage and Needs Assessment
DAR	Department of Agrarian Reform
DBM	Department of Budget and Management
DENR	Department of Environment and Natural Resources
DepEd	Department of Education
DILG	Department of Interior and Local Government
DOE	Department of Energy
DOF	Department of Finance
DOH	Department of Health
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DRR	Disaster Risk Reduction
DRR-CCA	Disaster Risk Reduction - Climate Change Adaptation
DRRM	Disaster Risk Reduction and Management
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
GDP	Gross Domestic Product
HFA	Hyogo Framework of Action
IEC	Information, Education and Communication
LDRRMF	Local Disaster Risk Reduction and Management Fund
LDRRMO	Local Disaster Risk Reduction and Management Office
LGUs	Local Government Units
MDG	Millennium Development Goals
MGB	Mines and Geosciences Bureau
MDRRMC	Municipal Disaster Risk Reduction and Management Council
MLGU	Municipal Local Government Unit
NCCAP	National Climate Change Action Plan
NDRRMC	National Disaster Risk Reduction and Management Council
NDRRMF	National Disaster Risk Reduction and Management Fund
NDRRMP	National Disaster Risk Reduction and Management Plan
NGO	Non-Government Organization
OPA	Office of the Provincial Agriculturist

OPSWD	Office of the Provincial Social Welfare and Development
OPV	Office of the Provincial Veterinarian
PAGASA	Philippine Atmospheric Geophysical and Astronomical Services Administration
PAR	Philippine Area of Responsibility
PDC	Provincial Development Council
PDP	Philippine Development Plan
PDRRMC	Provincial Disaster Risk Reduction and Management Council
PDRRMP	Provincial Disaster Risk Reduction and Management Plan
PDPFP	Provincial Development Plan and Physical Framework Plan
PENRO	Provincial Environment and Natural Resources Office
PGBh	Provincial Government of Bohol
PHIVOLCS	Philippine Institute of Volcanology and Seismology
PIA	Philippine Information Agency
PLGU	Provincial Local Government Unit
PNP	Philippine National Police
PPDC	Provincial Planning and Development Coordinator
PPDO	Provincial Planning and Development Office
PPP	Public-Private Partnership
RDRRMC	Regional Disaster Risk Reduction and Management Council
SAR	Search and Rescue
TaRSIER 117	Telephone and Radio System Integrated Emergency Response
TESDA	Technical Education and Skills Development Authority
UNDP	United Nations Development Fund

Understanding Basic DRRM Terms

A thorough risk analysis, vulnerability assessment as well as evaluation of the disaster risk reduction management capacity of the provincial government entail understanding of major terms related to disaster risk reduction management. These basic concepts[1] are discussed below.

- ***Hazards*** An event that is either natural or man-made which brings damage to people, property, livelihood or temporary or permanent cessation to social and economic life or environmental destruction. This can result to a disaster. Examples: typhoon, earthquakes, floods, flash floods, landslide, volcano eruption, storm surge, tsunami, fire, wars, civil unrest.
  Hazards could be alone or a solo occurrence. Hazards can also be successive or brought about by other hazards, e.g. Japan **earthquake** brought a fierce **tsunami**; or earthquakes bring landslide; or rains/ storms bring flooding. Hazards can be occurring as combination – typhoon/storm brings heavy rains and brings landslide or flooding.

- ***Disasters*** Results or effects of a HAZARD to a "vulnerable" community or to a poor community whose capacity and resources are not enough to meet the hazard Disasters can also result from massive destruction to lives and property (i.e. Yolanda), social and economic life and environmental destruction putting a temporary stop to day-to-day life.
  Not all hazards are disastrous. Hazards become disasters, if
  - ✓ There is a massive effect; more populace are affected;
  - ✓ They affect a vulnerable community whose day-to-day social and economic life will temporarily stop
  - ✓ The community does not have adequate capacity and enough resources to manage the extent of damage of the hazard
  - ✓ "Disaster-consciousness," which means the knowledge of people on disaster is lower /lesser than the actual or natural phenomenon or event and disaster preparedness is low.

- ***Capacity*** Collective effort and resources of people, families and communities, including government to work and collaborate to mitigate the effects of disasters, prepare for the emergency, and recover from the effect of the disaster. Resources increase the capacity of a community to deal with and manage the resources. Resources are anything or any event that has something to do with physical, social, livelihood, usual practices, abilities,

[1] Community-Based Disaster Risk Management, *"Pagsasanay sa Disaster Preparedness at Contingency Planning,"* ACCORD Project 2007, pp 23-45.

knowledge, governance, institutions, customs and views/values of people and local communities.

These examples below are helpful to illustrate capacity:

a) People who have stable jobs are better able to rise up and recover from a disaster than an ordinary daily-wager **(more resources and capacity)**
b) A community that has the leadership, resources and cooperation by all is more able to mobilize for community response and recover from a disaster **(capacity and resources)**
c) Strong and well-founded houses are not easily carried away by typhoons bringing strong winds
d) Children who are healthy and well-nourished do not easily get sick when brought to evacuation centers than those who are malnourished and therefore vulnerable for illnesses during evacuations
e) People who have more skills have bigger chances to find jobs and alternative work when disaster hits their communities

It is therefore evident that when people and local communities increase their capacity and resources to reduce risks and manage disasters, they become more disaster-prepared and less vulnerable to the effects of disasters and hazards.

- ***Vulnerability*** This refers to the tendency and chance that the effect of a hazard be more felt, intense and worst, uncontrollable in the community. Vulnerability includes set of conditions resulting from physical, social, economic, and environmental factors which increase susceptibility to losses from the impact of natural or human human-made hazards. Vulnerability can take a physical, social and economic form. Vulnerability puts people and communities in a situation where the effects (disaster) of a hazard will be greater.

  Vulnerability puts local communities in a WORSENED condition or situation (compared to before the disaster) due to or at the time of the disaster and will continue to be worst even after the disaster.

- ***Risk*** It is the probability of harmful consequences or expected losses, resulting from interaction between natural or human human-made hazards and vulnerable conditions. Severity of the hazard increases the disaster risk.

- ***Disaster Risk Management*** This is a systematic process of using administrative decisions, organization, operational skills and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impacts of natural hazards and related environmental and technological disasters. This comprises all forms of

activities, including structural and non- structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.[2]

[2] Philippine Disaster Risk Management System, Office of Civil Defence (OCD) and National Disaster Coordinating Council (NDCC), PowerPoint Slide No. 42.

Tables and Figures

EXECUTIVE SUMMARY

The enactment of Republic Act 10121 otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010 has laid the basis for a paradigm shift from just disaster preparedness and response to disaster risk reduction and management (DRRM).The National DRRM Plan serves as the national guide on how sustainable development can be achieved through inclusive growth while building the adaptive capacities of communities; increasing the resilience of vulnerable sectors; and optimizing disaster mitigation opportunities with the end in view of promoting people's welfare and security towards gender-responsive and rights-based sustainable development.

Over the past several years, the country has gained a lot of attention and momentum in the area of disaster risk reduction. Numerous projects and activities have been undertaken by various Philippine stakeholders and agencies in DRRM. However, sustaining the positive results and scaling them up to effect rippling positive changes in the lives of the people have been constant challenges. Threats remain. Disasters and people's risk to disasters are still present.

This is because the underlying causes of people's vulnerability has yet to be fully recognized and addressed. For years, DRR has focused more on efforts around disaster preparedness and response and not so much in identifying the hazard-prone areas and other factors which contribute to people's exposure to disasters; incorporating risk analysis to development plans; building people's capacities towards sustainable livelihood options; and the like. Although DRR has been gaining attention among peoples and institutions, complete paradigm shift from "disasters as an immediate product of hazards" to "disasters as a function of people's vulnerability" has not yet fully happened. Also, converging DRR and CCA remains to be a challenge, both in understanding, mainstreaming into plans and policies, including institutional mechanisms. Lastly, gaps in terms of increased knowledge, understanding and capacities remain and cause a big challenge for the country in terms of DRRM.

The NDRRMP outlines the activities aimed at strengthening the capacity of the national government and the local government units (LGUs) together with partner stakeholders, to build the disaster resilience of communities and to institutionalize arrangements and measures for reducing disaster risks, including projected climate risks and enhancing disaster preparedness and response capabilities at all levels. It highlights, among others, the importance of mainstream DRRM and CCA in the development processes such as policy formulation, socio-economic development planning, budgeting and governance particularly in the area of environment, agriculture, water, energy, health, education, poverty reduction, land-use and urban planning and public infrastructure and housing among others. Mainstreaming also puts to forth the need to develop common tools to analyze the various hazards and vulnerability factors which put our communities and people into harm's way.

The NDRRMP also highlights the need for institutionalizing DRRM policies, structures, coordination mechanisms and programs with continuing budget appropriation on DRR from national down to local levels. Through permanent mechanisms, competency and science-based capacity building activities can be done, alongside the nurturing of continuous

learning through knowledge development and management of good DRRM practices on the ground.
Last but not least, the NDRRMP adheres to the principles of good governance within the context of poverty alleviation and environmental protection. It is about partnerships and working together – engaging the participation of CSOs, the private sector and volunteers in the government's DRRM programs towards complementation of resources and effective delivery of services to the citizenry.

In accordance with the NDRRMF, through the NDRRMP, the country will have "Safer, adaptive and disaster resilient Filipino communities towards sustainable development. "This will be achieved through the four distinct yet mutually reinforcing priority areas, namely, (a) Disaster Prevention and Mitigation; (b) Disaster Preparedness; (c) Disaster Response; and (d) Disaster Recovery and Rehabilitation. Each priority area has its own long term goal, which when put together will lead to the attainment of our country's over goal/vision in DRRM.

These priority areas are not autonomous from the other nor do they have clear start and end points. The 4 priority areas are NOT seen as a mere cycle which starts in prevention and mitigation and ends in rehabilitation and recovery. They are:

(a) Mutual reinforce each other and are interoperable.
(b) DO NOT, SHOULD NOT and CANNOT stand alone.
(c) Have no clear starting nor ending points between each of the aspects and overlaps are to be expected.
(d) Are problem-needs and asset-strengths centered.
(e) All point to one direction ◊ reduce people's vulnerabilities and increasing their capacities.

In summary, the NDRRMP has 4 priority areas with 4 long term goals; 14 objectives; 24 outcomes; 56 outputs; and 93 activities.

Priority Areas	Long Term Goals	Objectives
Prevention and Mitigation	Avoid hazards and mitigate their potential impacts by reducing vulnerabilities and exposure and enhancing capacities of communities	• Reduce vulnerability and exposure of communities to all hazards • Enhance capacities of communities to reduce their own risks and cope with the impacts of all hazards
Disaster Preparedness	Establish and strengthen capacities of communities to anticipate, cope and recover from the	• Increase the level of awareness of the community to the threats and impacts of all hazards, risks and vulnerabilities • Equip the community with the necessary skills to cope with the

Priority Areas	Long Term Goals	Objectives
	negative impacts of emergency occurrences and disasters	negative impacts of a disaster • Increase the capacity of institutions • Develop and implement comprehensive national and local disaster preparedness policies, plans and systems
Disaster Response	Provide life preservation and meet the basic subsistence needs of affected population based on acceptable standards during or immediately after a disaster	• To decrease the number of preventable deaths and injuries • To provide basic subsistence needs of affected population • To immediately restore basic social services
Rehabilitation and Recovery	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle	• To restore people's means of livelihood and continuity of economic activities and business • To restore shelter and other building/installation • To reconstruct infrastructure and other public utilities • To assist in the physical and psychological rehabilitation of persons who suffered from the effects of disasters

The priority area on **Disaster Prevention and Mitigation** provides key strategic actions that give importance to activities revolving around hazards evaluation and mitigation, vulnerability analyses, identification of hazard-prone areas and mainstreaming DRRM into development plans. It is based on sound and scientific analysis of the different underlying factors which contribute to the vulnerability of the people and eventually, their risks and exposure to hazards and disasters.

Disaster Preparedness provides for the key strategic actions that give importance to activities revolving around community awareness and understanding; contingency planning; conduct of local drills and the development of a national disaster response plan. Risk-related information coming from the prevention and mitigation aspect is necessary in order for the preparedness activities to be responsive to the needs of the people and situation on the ground. Also, the policies, budget and institutional mechanisms established under the

prevention and mitigation priority area will be further enhanced through capacity building activities, development of coordination mechanisms. Through these, coordination, complementation and interoperability of work in DRRM operations and essential services will be ensured. Behavioral change created by the preparedness aspect is eventually measured by how well people responded to the disasters. At the frontlines of preparedness are the local government units, local chief executives and communities.

Disaster Response gives importance to activities during the actual disaster response operations from needs assessment to search and rescue to relief operations to early recovery activities are emphasized. The success and realization of this priority area rely heavily on the completion of the activities under both the prevention and mitigation and preparedness aspects, including among others the coordination and communication mechanisms to be developed. On-the-ground partnerships and the vertical and horizontal coordination work between and among key stakeholders will contribute to successful disaster response operations and its smooth transition towards early and long term recovery work.

The **Rehabilitation and Recovery** priority area cover areas like employment and livelihoods, infrastructure and lifeline facilities, housing and resettlement, among others. These are recovery efforts done when people are already outside of the evacuation centers.

The NDRRMP recognizes that certain concerns cut across the 4 DRRM priority areas. These include health, human-induced disasters, gender mainstreaming, environmental protection, cultural sensitivity or indigenous practices, and the rights based approach. They are a combination of issues and approaches that should be taken into consideration in each of the priority areas.

The NDRRMP is scheduled to commence in 2011, immediately after its approval from the members of the National DRRM Council members. In general, the set of activities are divided into three timelines, with the first two having 2years interval while the last one with 5 years, to wit:

Short term 2011 – 2013
Medium term 2014 – 2016
Long term 2017 – 2028

However, specifically for the priority areas on **Response and Rehabilitation and Recovery**, Operational Timelines were used primarily to give an overall guidance on “rapid” time element in providing humanitarian activities and recovering from the disasters. Likewise, the operational timelines will guide the plan’s implementation and monitoring activities for the two priority areas. These operational timelines are as follows:

Immediate Term (IT) within 1 year after the occurrence of the disaster
Short Term (ST) within 1 to 3 years after the occurrence of the disaster
Medium Term (MT) within 3 to 6 years after the occurrence of the disaster
Long Term (LT) beyond 6 years after the occurrence of the disaster

All throughout the NDRRMP, various strategies were identified to be used in order to achieve the desired key result areas under each DRRM aspect. These are:

♣ Advocacy and Information, Education and Communication (IEC)

♣ Competency-based capability building
♣ Contingency Planning
♣ Education on DRRM and CCA for ALL
♣ Institutionalization of DRRMCs and LDRRMOs
♣ Mainstreaming of DRR in ALL plans
♣ Research, Technology Development and Knowledge Management
♣ Monitoring, evaluation and learning
♣ Networking and partnership building between and among stakeholders, media and tiers of government.

In each of the activities under the NDRRMP, agency leads and implementing partner agencies and/or groups were identified. Following RA 10121, the overall lead or focal agency for each of the four priority areas are the vice-chairpersons of the National DRRM Council.

The NDRRMP also identified areas where **resources** can be tapped for the implementation of the activities. These are both for the national and local levels. However, because mainstreaming of DRRM into policies and plans is the primary thrust of the NDRRMP, these activities will not have separate funding sources but will be mainstreamed into the activities of the agencies and offices. Sources identified include the General Appropriations Act (GAA); National and Local DRRM Funds; Internal Revenue Allocation (IRA); Priority Development Assistance Fund (PDAF); Donor Funds; Adaptation and Risk Financing, among others. Aside from the fund sources, the NDRRMP will also tap into the non-monetary resources available which can help attain the targets identified in this plan. These are the community-based good practices for replication and scaling up; indigenous practices on DRRM; Public-Private-Partnerships; and the different networks (DRR and CCA) of key stakeholders.

Monitoring and evaluation are essential components of results-based programming in DRRM as these will ensure that the plan's on-time implementation and that learnings from past experiences become input to the plan altogether. Also, through monitoring and evaluation activities, appropriate and needed revisions and/or changes can be identified, from the identified activities to the implementation mechanisms, in case more appropriate ones are realized. These will be led by the Office of Civil Defense, in close coordination with the four vice chairpersons of the NDRRMC by focusing on relevance, effectiveness, efficiency, impact and sustainability. A standard monitoring and evaluation template will be developed by the OCD together with the members of the Technical Management Group.

The NDRRMP was developed in partnership with the key stakeholders in DRRM in the country. Likewise, the success of the plan and the attainment of its targets and objective can only happen if an all-of-government and all-of society approach is done. By working together and working hand-in hand, we can achieve safer, adaptive and disaster resilient Filipino communities towards sustainable development.

1.0 Introduction

Background

The Philippines is exposed to natural and human-induced hazards due to its geography and geology as well as the presence of internal disputes in some areas. Between 1990 and 2006, the annual direct damages caused by disasters amount to PhP20 billion every year or roughly 0.5% of the GDP on the average, according to the National Disaster Risk Reduction and Management Council (NDRRMC). However, the losses caused by tropical storm Ondoy and typhoon Pepeng in 2009 is estimated to be about 2.7% of the GDP that year. These are compelling reasons why the Philippines should adopt disaster risk reduction and management (DRRM) and climate change adaptation (CCA).[3]

Hazards – both natural and human induced – happen due to geological, meteorological, hydrological, oceanic, biological, and technological sources, sometimes acting in combination. Hazards are of different intensities for different areas and levels of vulnerability, as determined from historical evidence and scientific analysis. Disasters can be avoided and mitigated

Recorded history tells us that the Filipino people have borne loss of lives, injury and other health impacts, property damage, loss of livelihoods and services, social and economic disruption or environmental damage, and the negative effects have even risen. Our communities, towns and cities have become more susceptible to the damaging effects of hazards.

Due to its geography and geology as an island, Bohol Province is likewise exposed to numerous natural and human-induced hazards in the past years. A major event that has put Bohol Province in the disaster map was the 7.2 magnitude (Ms) earthquake of tectonic origin that occurred in the province on October 15, 2013. The disastrous event, which is now called “The Great Bohol Earthquake of 2013” has caused extensive damages to service infrastructures, government facilities as well as centuries-old religious structures declared as national cultural treasures. Thousands of residential homes totally collapsed and several thousand others were partially destroyed. Bridges and access roads sustained considerable damages. Since then, Bohol gained a lot of attention and momentum in the area of disaster risk reduction.

[3] Primer of the National Disaster Risk Reduction Management Plan, 2011-2018; p1

The earthquake event, though disastrous and devastation, has brought a deep sense of awareness and realization to the Boholanos led by the indefatigable Governor Edgar M. Chatto to work together to “build back Bohol better” and to prepare a plan for Boholano communities to be more disaster resilient. Although the Provincial Government of Bohol (PGBh) has already prepared what was then called a Provincial Disaster Risk Reduction Management (PDRRM) Plan, the 7.2M earthquake experience has inspired provincial leaders and stakeholders, especially the Provincial Disaster Risk Reduction Management Council (PDRRMC), to revisit the existing plan and make this more responsive to the risk and vulnerabilities of Bohol to multi hazards and disasters.

The enactment of Republic Act 10121 otherwise known as the Philippine Disaster Risk Reduction and Management Act of 2010 has laid the basis for a paradigm shift from just disaster preparedness and response to disaster risk reduction and management (DRRM). The National Disaster Risk Reduction Management Plan that was adopted to operationalize RA 10121 became the basis and main reference for the preparation of the Provincial Disaster Risk Reduction Management Plan.

The United Nations Development Programme (UNDP) has provided technical assistance to the Provincial Government of Bohol for increased disaster preparedness, resiliency and disaster risk reduction management to cope with emergency response during disasters through the preparation of the Provincial Disaster Risk Reduction Management Plan (PDRRMP) that is aligned with the National Risk Reduction Management Plan (NDRRMP) as well as with Provincial Development Plan and Physical Framework Plan (PDPFP).

Plan Objectives

The objectives of the Provincial Disaster Risk Reduction Management Plan are best summarized as follows:

- Identify the multi-hazards affecting Bohol Province;
- Review the historical timeline in regard to the calamities that occurred in Bohol for the past five years and beyond;
- Review the recent Bohol Risk and Vulnerability Assessment results and the hazard maps from various sources;
- Assess Provincial Government’s strengths and weaknesses in DRRM;
- Craft DRRM Vision, Mission Statements including Goals and Strategies, and 3-Year Action Plan with Budget Estimates;
- Develop local policies specific to implementing the DRRM Plan; and
- Develop Monitoring and Evaluation Framework, Sustainability and Communication Plans

Legal Framework

The major references in the preparation of the Plan include the following:

- National DRRM Plan based on RA 10121 of 2010 that provides a legal basis for policies, plans and programs to deal with disasters;
- The Philippine Disaster Management System from the Office of Civil Defense – National Disaster Coordinating Council (OCD-NDCC)
- Bohol Provincial Disaster Risk Reduction Management Plan of 2012 was approved in December 2012 in compliance of the directive from the Department of Interior and Local Government (DILG).
- Executive Order No 10, series of 2019, reconstituting and strengthening the PDRRMC
- JMC (DILG, NDRRMC, DBM, CSC), 2014-01, dated April 4, 2014 providing guidelines for the creation of Local DRRM and Barangay DRRM Committees at all LGU levels
- Work and Financial Plan and Request for Budget Allocations for 2019 for the implementation of the DRRM Plan at the Governor's Office

2.0 Risk Profile and the State of the DRRM

The Bohol Provincial Development and Physical Framework Plan (PDPFP, Volume 1 devotes two sections that describe the hazards and disasters faced by the island province. Section 3.2.5 discusses on areas prone to natural hazards) and Section 3.2.6 describes disaster risk management.

VULNERABILITY AND RISK ASSESSMENT[4]

- **Population Hazard Exposure**
  - **Population Exposure to Earthquake-induced Landslide** (EIL)

    There are 939 inhabitants or roughly 0.05% of Bohol's population in 2010 are highly exposed to EIL. They are found in Bilar, Garcia-Hernandez, Guindulman, Bilar, Jagna, Lila, Loay, Loboc, Pilar, Sevilla, Sierra Bullones, Sikatuna and Valencia. The rest of the towns and City of Tagbilaran have moderate (0.82%) and low (2.5%) population exposure to EIL. Anda, Baclayon, Bien Unido, Calape, Clarin, Cortes, Dauis, Getafe, Inabanga, Loay, Loon, Maribojoc, Panglao, Pres. C.P. Garcia, San Miguel, Talibon, Trinidad, Tubigon and Ubay. The rest of the 23 municipalities have either 1% or 2% population exposure to EIL.

Table PE-1: **Population Exposure to Earthquake-induced Landslide by Municipality**
Bohol Province

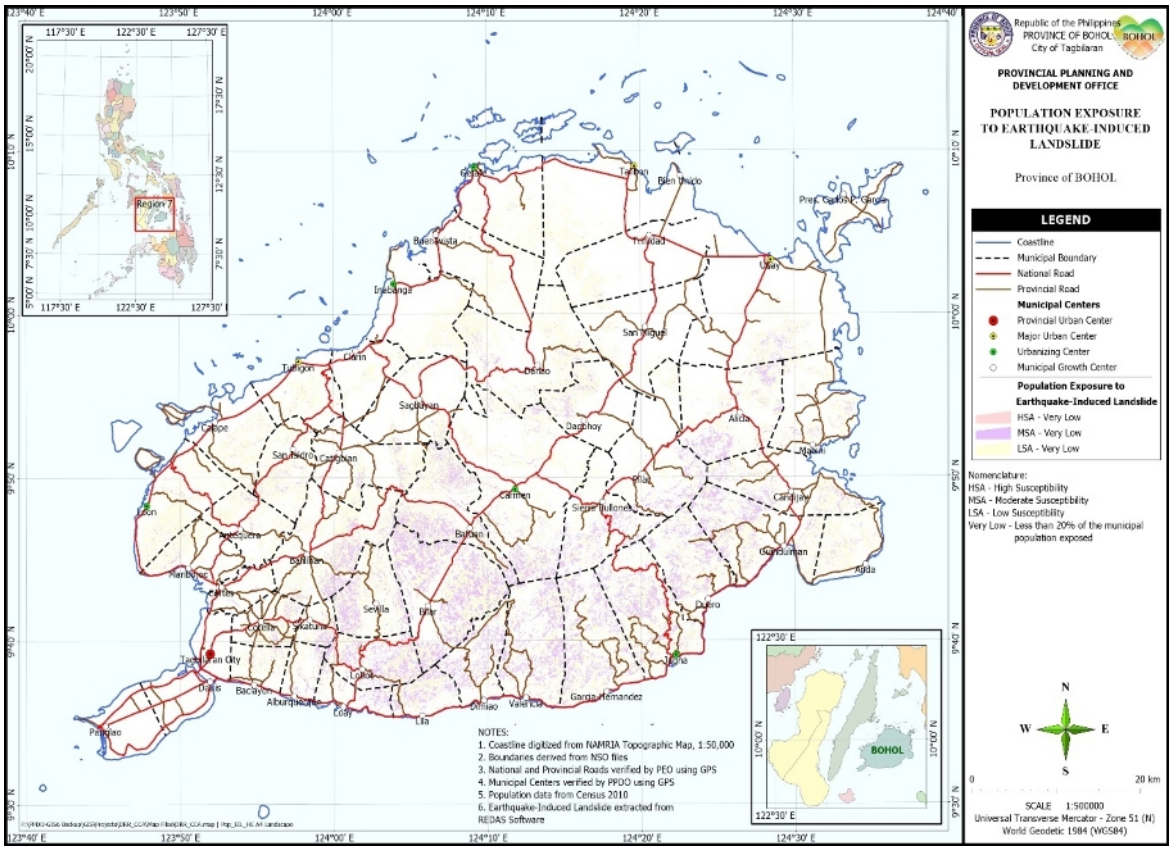
Municipality	Population 2010	Exposed Population			Percent Population Exposure		
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas
Alburquerque	9,921	9	243	621	0.094%	2.449%	6.256%
Alicia	22,285	9	412	1,129	0.040%	1.848%	5.066%
Anda	16,909	0	122	1,500	0.000%	0.721%	8.873%
Antequera	14,481	0	98	1,108	0.000%	0.678%	7.651%
Baclayon	18,630	0	103	766	0.001%	0.553%	4.110%
Balilihan	17,147	5	476	2,097	0.031%	2.777%	12.231%
Batuan	12,431	8	763	2,205	0.066%	6.138%	17.741%
Bien Unido	25,796	0	0	0	0.000%	0.000%	0.000%

[4] Provincial Development and Physical Framework Plan of the Province of Bohol, 2016-2028, pp. 51-83

Municipality	Population 2010	Exposed Population			Percent Population Exposure		
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas
Bilar	17,098	135	1,455	2,629	0.791%	8.512%	15.374%
Buenavista	27,031	0	11	602	0.000%	0.040%	2.227%
Calape	30,146	0	61	904	0.000%	0.204%	3.000%
Candijay	29,043	9	511	2,037	0.029%	1.759%	7.014%
Carmen	43,579	57	480	2,190	0.130%	1.101%	5.025%
Catigbian	22,686	0	170	1,193	0.001%	0.751%	5.257%
Clarin	20,296	0	14	368	0.000%	0.068%	1.815%
Corella	7,699	0	108	563	0.002%	1.409%	7.319%
Cortes	15,294	0	46	305	0.000%	0.301%	1.997%
Dagohoy	18,868	1	129	767	0.003%	0.684%	4.063%
Danao	17,952	0	120	1,146	0.002%	0.668%	6.383%
Dauis	39,448	0	5	152	0.000%	0.013%	0.384%
Dimiao	15,166	34	582	768	0.226%	3.835%	5.063%
Duero	17,580	8	614	1,655	0.045%	3.493%	9.412%
Garcia-Hernandez	23,038	25	838	2,700	0.111%	3.636%	11.718%
Getafe	27,788	0	3	203	0.000%	0.012%	0.731%
Guindulman	31,789	20	1,024	2,822	0.063%	3.220%	8.878%
Inabanga	43,291	0	26	945	0.000%	0.059%	2.182%
Jagna	32,566	16	855	3,030	0.050%	2.624%	9.305%
Lila	11,985	158	532	952	1.320%	4.435%	7.946%
Loay	16,261	33	395	685	0.201%	2.426%	4.211%
Loboc	16,312	119	1,230	2,103	0.729%	7.538%	12.893%
Loon	42,800	0	48	1,298	0.000%	0.113%	3.033%
Mabini	28,174	0	241	1,601	0.000%	0.856%	5.684%
Maribojoc	20,491	0	39	613	0.000%	0.190%	2.991%
Panglao	28,603	0	1	13	0.000%	0.004%	0.045%
Pilar	26,887	31	399	789	0.114%	1.486%	2.936%
Pres. C. P. Garcia	23,287	0	2	134	0.000%	0.008%	0.576%
Sagbayan	20,091	0	95	851	0.000%	0.471%	4.234%
San Isidro	9,125	0	104	929	0.002%	1.142%	10.177%
San Miguel	23,574	0	14	258	0.000%	0.060%	1.095%
Sevilla	10,443	15	480	1,600	0.148%	4.599%	15.324%

Municipality	Population 2010	Exposed Population			Percent Population Exposure		
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas
Sierra Bullones	24,698	122	776	1,174	0.493%	3.142%	4.752%
Sikatuna	6,380	1	246	787	0.023%	3.858%	12.334 %
Tagbilaran City	96,792	0	63	355	0.000%	0.065%	0.367%
Talibon	61,373	0	4	265	0.000%	0.006%	0.432%
Trinidad	28,828	0	12	285	0.000%	0.041%	0.988%
Tubigon	44,902	0	60	1,071	0.000%	0.134%	2.385%
Ubay	68,578	0	134	823	0.000%	0.196%	1.200%
Valencia	27,586	122	1,297	2,649	0.441%	4.702%	9.602%
T o t a l	**1,255,128**	**939**	**15,441**	**53,639**	**0.0515 %**	**0.8303 %**	**2.7228 %**

Map PE-1. **Population Exposure Map to Earthquake-induced Landslide**
Bohol Province



Population Exposure to Ground Shaking

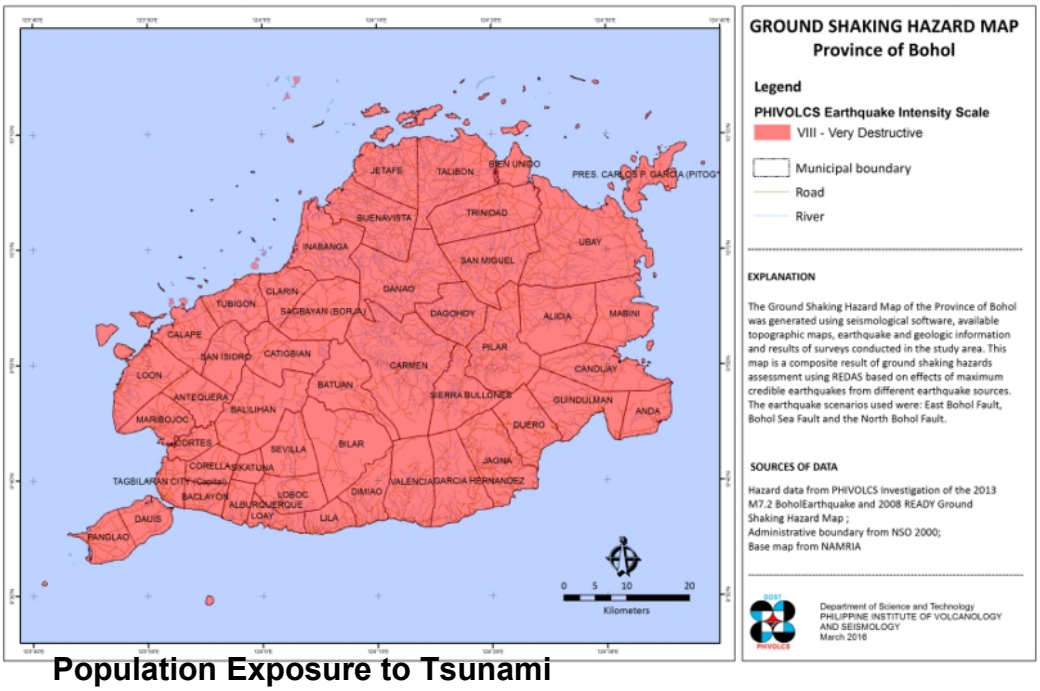
All of the 47 municipalities and the city in Bohol are highly susceptible to ground shaking at Intensity 7 and 8. About 21% or 258,048 Boholanos and 76% or 950,718 people are highly exposed to ground shaking with intensity 7 and 8, respectively.

Table No. PE-2. **Population Exposure to Ground Shaking Hazard Per Municipality**
Bohol Province

Municipality	Municipal Population 2010	Exposed Population		Percent Population Exposure	
		Intensity 8 and above Ground Shaking	Ground Shaking up to Intensity 7	Intensity 8 and above Ground Shaking	Ground Shaking up to Intensity 7
Alburquerque	9,921	9,919		99.975%	
Alicia	22,285	22,285		100.000%	
Anda	16,909	16,798		99.344%	
Antequera	14,481	9,053	5,428	62.517%	37.483%
Baclayon	18,630	17,267		92.683%	
Balilihan	17,147	16,095	1,052	93.865%	6.135%
Batuan	12,431	12,431		100.000%	
Bien Unido	25,796	608	17,796	2.356%	68.988%
Bilar	17,098	17,098		100.000%	
Buenavista	27,031	15,118	8,041	55.928%	29.747%
Calape	30,146	1,065	29,081	3.532%	96.466%
Candijay	29,043	28,851		99.339%	
Carmen	43,579	43,045	534	98.775%	1.225%
Catigbian	22,686	12,721	9,965	56.075%	43.925%
Clarin	20,296	12,743	7,514	62.785%	37.021%
Corella	7,699	7,699		100.000%	
Cortes	15,294	15,219		99.512%	
Dagohoy	18,868	18,835	33	99.824%	0.176%
Danao	17,952	9,024	8,928	50.268%	49.732%
Dauis	39,448	34,283	4,441	86.907%	11.258%
Dimiao	15,166	15,156		99.931%	
Duero	17,580	17,302		98.419%	
Garcia-Hernandez	23,038	22,968		99.695%	
Getafe	27,788	21,573	1,669	77.635%	6.007%
Guindulman	31,789	31,608		99.429%	
Inabanga	43,291	31,279	8,638	72.253%	19.954%
Jagna	32,566	32,163		98.764%	
Lila	11,985	11,741		97.967%	
Loay	16,261	16,016		98.495%	
Loboc	16,312	16,312		100.000%	
Loon	42,800	1,179	41,621	2.754%	97.246%
Mabini	28,174	27,157		96.391%	
Maribojoc	20,491	13,523	6,183	65.994%	30.173%

Municipality	Municipal Population 2010	Exposed Population		Percent Population Exposure	
		Intensity 8 and above Ground Shaking	Ground Shaking up to Intensity 7	Intensity 8 and above Ground Shaking	Ground Shaking up to Intensity 7
Panglao	28,603	27,488	123	96.103%	0.429%
Pilar	26,887	26,887		100.000%	
Pres. C.P. Garcia	23,287	1,120	20,164	4.809%	86.591%
Sagbayan	20,091	6,251	13,860	31.113%	68.986%
San Isidro	9,125	508	8,617	5.569%	94.431%
San Miguel	23,574	22,837	737	96.873%	3.127%
Sevilla	10,443	10,443		100.000%	
Sierra Bullones	24,698	24,698		100.000%	
Sikatuna	6,380	6,380		100.000%	
Tagbilaran City	96,792	96,418		99.613%	
Talibon	61,373	10,404	39,885	16.952%	64.988%
Trinidad	28,828	24,699	4,115	85.679%	14.273%
Tubigon	44,902	22,139	19,325	49.305%	43.037%
Ubay	68,578	66,969	299	97.654%	0.436%
Valencia	27,586	27,576		99.964%	
T o t a l	**1,255,128**	**950,718**	**258,048**	**75.74%**	**20.55%**

Map PE-2. **Population Exposure Map to Ground Shaking**
Bohol Province



Population Exposure to Tsunami

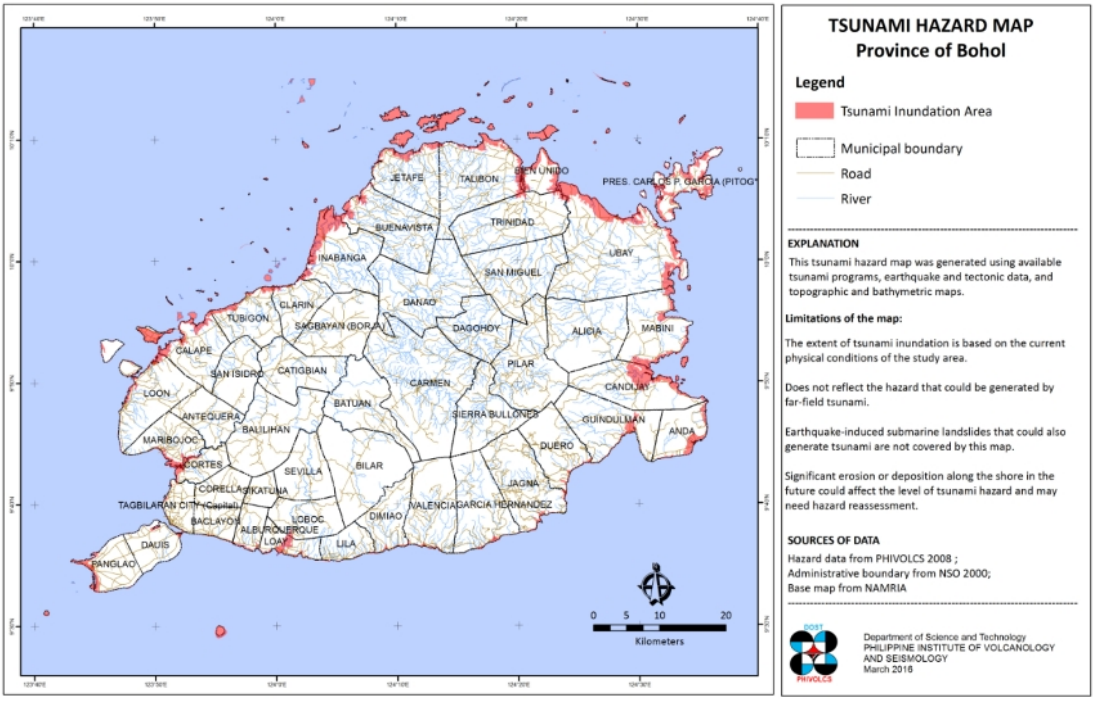
Thirty municipalities and the city, with a total population of 143,727 or 11.45% of the Bohol's population, are highly exposed to tsunami. These areas are located along Bohol's coastal zones including its island barangays and islets. The municipalities of Ubay, Talibon, Bien Unido, Inabanga and Getafe had the highest inhabitants heavily exposed or at risk. Only 17 municipalities, located at the hinterlands, are safe from tsunami. These are the municipalities of Alicia, Antequera, Balilihan, Batuan, Bilar, Carmen, Catigbian, Corella, Dagohoy, Danao, Pilar, Sagbayan, San Isidro, San Miguel, Sevilla, Sierra-Bullones and Sikatuna.

Table PE-3. **Population Exposure to Tsunami Hazard Per Municipality**
Bohol Province

Municipality	Municipal Population 2010	Exposed Population to Tsunami Hazard	Percentage of Exposed Population to Tsunami Hazard
Alburquerque	9,921	616	6.210%
Alicia	22,285	0	0.000%
Anda	16,909	4,026	23.809%
Antequera	14,481	0	0.000%
Baclayon	18,630	1,973	10.593%
Balilihan	17,147	0	0.000%
Batuan	12,431	0	0.000%
Bien Unido	25,796	13,139	50.936%
Bilar	17,098	0	0.000%
Buenavista	27,031	1,433	5.302%
Calape	30,146	9,479	31.444%
Candijay	29,043	4,530	15.596%
Carmen	43,579	0	0.000%
Catigbian	22,686	0	0.000%
Clarin	20,296	794	3.910%
Corella	7,699	0	0.000%
Cortes	15,294	1,673	10.938%
Dagohoy	18,868	0	0.000%
Danao	17,952	0	0.000%
Dauis	39,448	1,790	4.538%
Dimiao	15,166	455	3.000%
Duero	17,580	1,471	8.368%
Garcia-Hernandez	23,038	1,490	6.466%
Getafe	27,788	10,283	37.006%
Guindulman	31,789	4,544	14.295%
Inabanga	43,291	12,135	28.030%
Jagna	32,566	3,322	10.202%
Lila	11,985	449	3.747%
Loay	16,261	4,080	25.092%
Loboc	16,312	247	1.516%
Loon	42,800	4,392	10.261%
Mabini	28,174	3,973	14.100%

Municipality	Municipal Population 2010	Exposed Population to Tsunami Hazard	Percentage of Exposed Population to Tsunami Hazard
Maribojoc	20,491	3,305	16.130%
Panglao	28,603	5,320	18.601%
Pilar	26,887	0	0.000%
Pres. Carlos P. Garcia	23,287	9,572	41.104%
Sagbayan	20,091	0	0.000%
San Isidro	9,125	0	0.000%
San Miguel	23,574	0	0.000%
Sevilla	10,443	0	0.000%
Sierra Bullones	24,698	0	0.000%
Sikatuna	6,380	0	0.000%
Tagbilaran City	96,792	1,524	1.575%
Talibon	61,373	13,405	21.841%
Trinidad	28,828	1,192	4.134%
Tubigon	44,902	7,598	16.921%
Ubay	68,578	14,513	21.163%
Valencia	27,586	1,003	3.635%
T o t a l	1,255,128	143,727	11.45%

Map PE-3. **Population Exposure Map to Tsunami**
Bohol Province



Population Exposure to Liquefaction

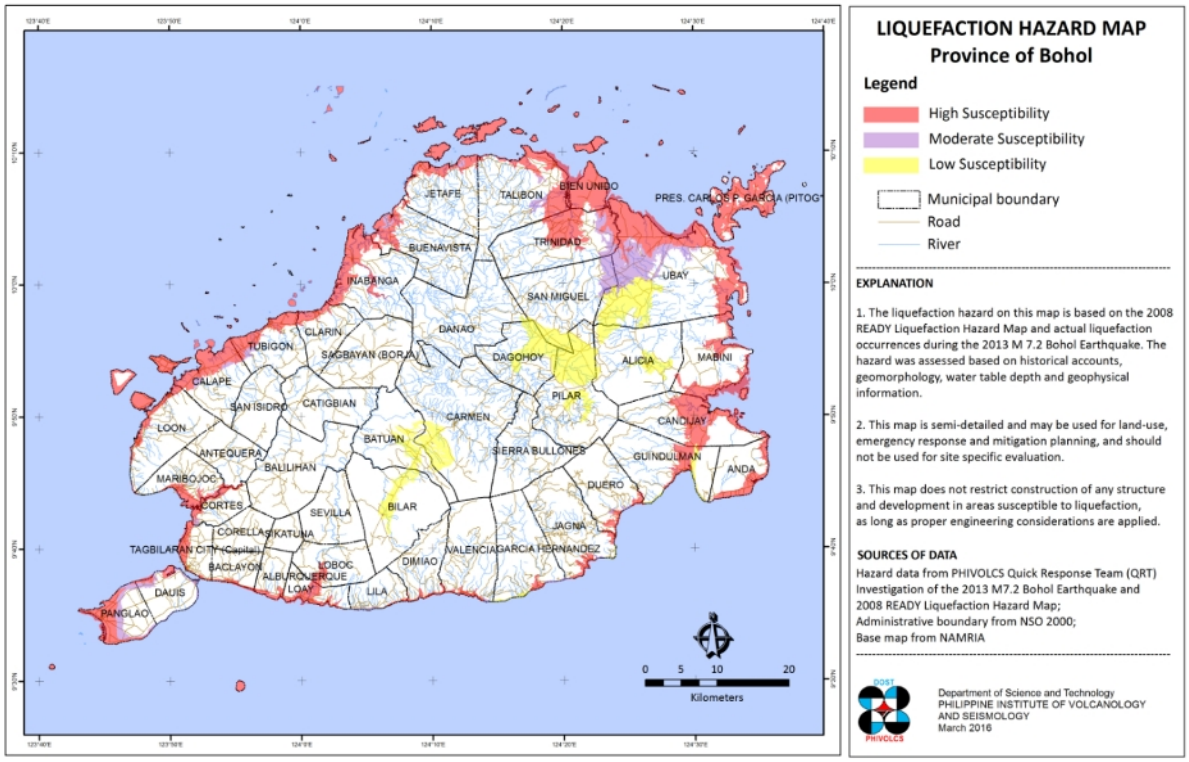
A very high percentage of population in Bohol are exposed to high susceptibility to liquefaction at 26.54% or 333,127 inhabitants compared to those at moderate (34,006 or 2.71%) and low susceptibility (40,947 or 3.26%). There are 14 municipalities and the city with high percentage of population exposed to liquefaction, namely, 1) Tagbilaran City (31,393), 2) Ubay (29,754), 3) Talibon (24,750), 4) Tubigon (22,754), 6) Calape (19,082), 7) Bien Unido (18,406), 8) Pres. C. P. Garcia (17,798), 9) Loon (16,129), 10) Panglao (15,390), 11) Getafe (14,097), 12) Trinidad (12,743), 13) Candijay (10,317), 14) Mabini (8,617) and 15) Maribojoc (7,937). The municipalities that are not exposed to liquefaction and are safe from high susceptibility are Balilihan, Catigbian, Corella, Pilar, Sagbayan, San Isidro, Sevilla, Siearra Bullones, San Miguel and Sikatuna.

Table PE-4. **Population Exposure to Liquefaction Hazard Per Municipality**
Bohol Province

Municipality	Municipal Population 2010	Exposed Population			Percent Population Exposure		
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas
Alburquerque	9,921	2,169			21.867%		
Alicia	22,285	19		4,756	0.086%		21.340%
Anda	16,909	6,415			37.939%		
Antequera	14,481	239			1.653%		
Baclayon	18,630	4,866			26.117%		
Balilihan	17,147						
Batuan	12,431			3,092			24.874%
Bien Unido	25,796	18,406			71.351%		
Bilar	17,098			3,118			18.237%
Buenavista	27,031	6,066	1,538		22.440%	5.689%	
Calape	30,146	19,082	1,293		63.298%	4.288%	
Candijay	29,043	10,315	220	24	35.515%	0.758%	0.082%
Carmen	43,579			2,933			6.731%
Catigbian	22,686						
Clarin	20,296	6,171			30.407%		
Corella	7,699						
Cortes	15,294	2,955	897		19.322%	5.866%	
Dagohoy	18,868			7,209			38.207%
Danao	17,952			25			0.137%
Dauis	39,448	2,354	6,231		5.969%	15.796%	
Dimiao	15,166	1,548			10.204%		
Duero	17,580	4,093	747		23.282%	4.248%	
Garcia-Hernandez	23,038	2,374	307	1,020	10.307%	1.334%	4.429%
Getafe	27,788	14,097			50.730%		

Municipality	Municipal Population 2010	Exposed Population			Percent Population Exposure		
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas
Guindulman	31,789	7,453		974	23.446%		3.063%
Inabanga	43,291	15,081			34.836%		
Jagna	32,566	7,406	326	129	22.740%	1.001%	0.397%
Lila	11,985	1,024	603		8.543%	5.027%	
Loay	16,261	7,773	41		47.800%	0.251%	
Loboc	16,312	2,243			13.749%		
Loon	42,800	16,129	710	121	37.686%	1.658%	0.282%
Mabini	28,174	8,617			30.584%		
Maribojoc	20,491	7,937		24	38.732%		0.119%
Panglao	28,603	15,392	4,762		53.814%	16.650%	
Pilar	26,887			6,948			25.841%
Pres. C. P. Garcia	23,287	17,798			76.431%		
Sagbayan	20,091						
San Isidro	9,125						
San Miguel	23,574		3,214	1,679		13.634%	7.123%
Sevilla	10,443						
Sierra Bullones	24,698						
Sikatuna	6,380						
Tagbilaran City	96,792	31,393	319		32.433%	0.329%	
Talibon	61,373	24,750	922		40.328%	1.503%	
Trinidad	28,828	12,743	2,247		44.204%	7.794%	
Tubigon	44,902	22,754	845		50.676%	1.881%	
Ubay	68,578	29,754	8,638	8,885	43.387%	12.596%	12.957%
Valencia	27,586	3,710	147	10	13.450%	0.532%	0.035%
T O T A L	**1,255,128**	**333,127**	**34,006**	**40,947**	**26.54%**	**2.71%**	**3.26%**

Map PE-4. **Population Exposure Map to Liquefaction**
Bohol Province



Population Exposure to Storm Surge

Thirty (30) of the coastal municipalities in Bohol are highly exposed to storm surge hazard. About 46,227 or 3.68 % of the province's population are exposed with 5,912 hectares affected. The top 5 municipalities with high percentage of exposure are Getafe (8,048 or 29.45%), Bien Unido (8.048 or 31.20%), Talibon (7,151 or 11.65% and Ubay (2,444 or 3.56%). The 18 municipalities of Alicia, Antequera, Balilihan, Batuan, Bilar, Carmen, Catigbian, Corella, Dagohoy, Danao, Loboc, Pilar, Sagbayan, San Isidro, San Miguel, Sevilla, Sierra Bullones and Sikatuna are safe from exposure to liquefaction.

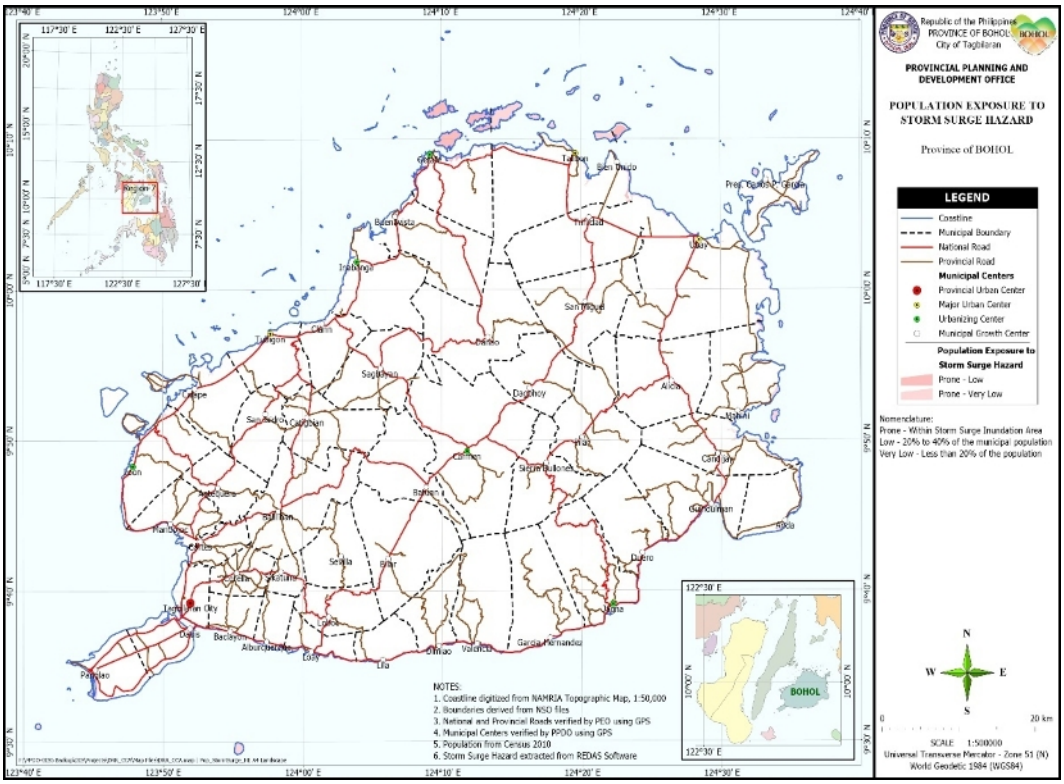
Table PE-5. **Population Exposure to Storm Surge Hazard Per Municipality**
Bohol Province

Municipality	Municipal Population 2010	Area Affected (Ha.)	Population Exposed to Storm Surge Hazard	Percentage of Population Exposed to Storm Surge Hazard
Alburquerque	9,921	29.173	265	2.673%
Alicia	22,285			
Anda	16,909	137.440	740	4.377%

Municipality	Municipal Population 2010	Area Affected (Ha.)	Population Exposed to Storm Surge Hazard	Percentage of Population Exposed to Storm Surge Hazard
Antequera	14,481			
Baclayon	18,630	167.455	1,337	7.179%
Balilihan	17,147			
Batuan	12,431			
Bien Unido	25,796	402.469	8,048	31.198%
Bilar	17,098			
Buenavista	27,031	14.277	150	0.554%
Calape	30,146	117.062	1,146	3.803%
Candijay	29,043	175.312	416	1.434%
Carmen	43,579			
Catigbian	22,686			
Clarin	20,296	26.691	342	1.683%
Corella	7,699			
Cortes	15,294	27.749	227	1.487%
Dagohoy	18,868			
Danao	17,952			
Dauis	39,448	2.679	14	0.035%
Dimiao	15,166	9.953	58	0.384%
Duero	17,580	33.634	331	1.882%
Garcia-Hernandez	23,038	38.530	401	1.741%
Getafe	27,788	1,459.342	8,184	29.452%
Guindulman	31,789	54.237	486	1.530%
Inabanga	43,291	113.253	1,469	3.392%
Jagna	32,566	41.172	641	1.970%
Lila	11,985	39.323	337	2.812%
Loay	16,261	68.098	875	5.381%
Loboc	16,312			
Loon	42,800	108.848	1,138	2.660%
Mabini	28,174	391.137	1,567	5.563%
Maribojoc	20,491	88.349	787	3.842%
Panglao	28,603	234.153	2,013	7.039%
Pilar	26,887			
Pres. Carlos P. Garcia	23,287	409.255	3,095	13.290%
Sagbayan	20,091			
San Isidro	9,125			
San Miguel	23,574			
Sevilla	10,443			
Sierra Bullones	24,698			
Sikatuna	6,380			

Municipality	Municipal Population 2010	Area Affected (Ha.)	Population Exposed to Storm Surge Hazard	Percentage of Population Exposed to Storm Surge Hazard
Tagbilaran City	96,792	13.824	696	0.719%
Talibon	61,373	1,181.233	7,151	11.652%
Trinidad	28,828	3.255	7	0.025%
Tubigon	44,902	60.105	1,448	3.226%
Ubay	68,578	440.888	2,444	3.564%
Valencia	27,586	23.423	410	1.488%
T o t a l	**1,255,128**	**5,912**	**46,227**	**3.683%**

Map PE-5. **Population Exposure Map to Storm Surge**
Bohol Province



Population Exposure to Rain-induced Landslide (RIL)

A total of 66,291 or 5.28% of the Boholanos are living in areas highly susceptible to RIL while 180,801 or 14.40% and 400,211 or 31.88% of Boholanos are exposed to moderately and low susceptible areas, respectively. Potentially vulnerable segments of society such as its school-age population and low-income families are particularly susceptible to rainfall-induced landslides. The top 10 municipalities with population highly susceptible to RIL are Guindulman (8,096), Anda (7,148), Jagna (6,018), Mabini (5,887), Candijay (3,299), Ubay (2,955), Maribojoc (2,841), Valencia (2,726) and Garcia-Henandez (2,708).

There are 5,371 or 0.42% Boholanos exposed to possible landslide deposit accumulation zone. These are located in 13 municipalities of Mabini (747), Duero (663), Maribijoc (536), Guindulman (472), Valencia (347), Garcia-Hernadez (345), Jagna (325), Candijay (297), Pilar (236), Sagbayan (36), Ubay (14), Catigbian (10) and Balilihan (8).

The affected population living within the RIL susceptible areas, comprising about 20% of the total population, is composed of mostly poor families living within the periphery or at the foot of hills or mountains and flood-prone areas. They are at risk relative to their location since falling boulders and rocks may directly hit their homes and endanger their lives and properties. With the current annual rate of 1.06% population growth, it is expected that there would be a moderate increase in exposure to identified prone areas or high susceptibility areas.

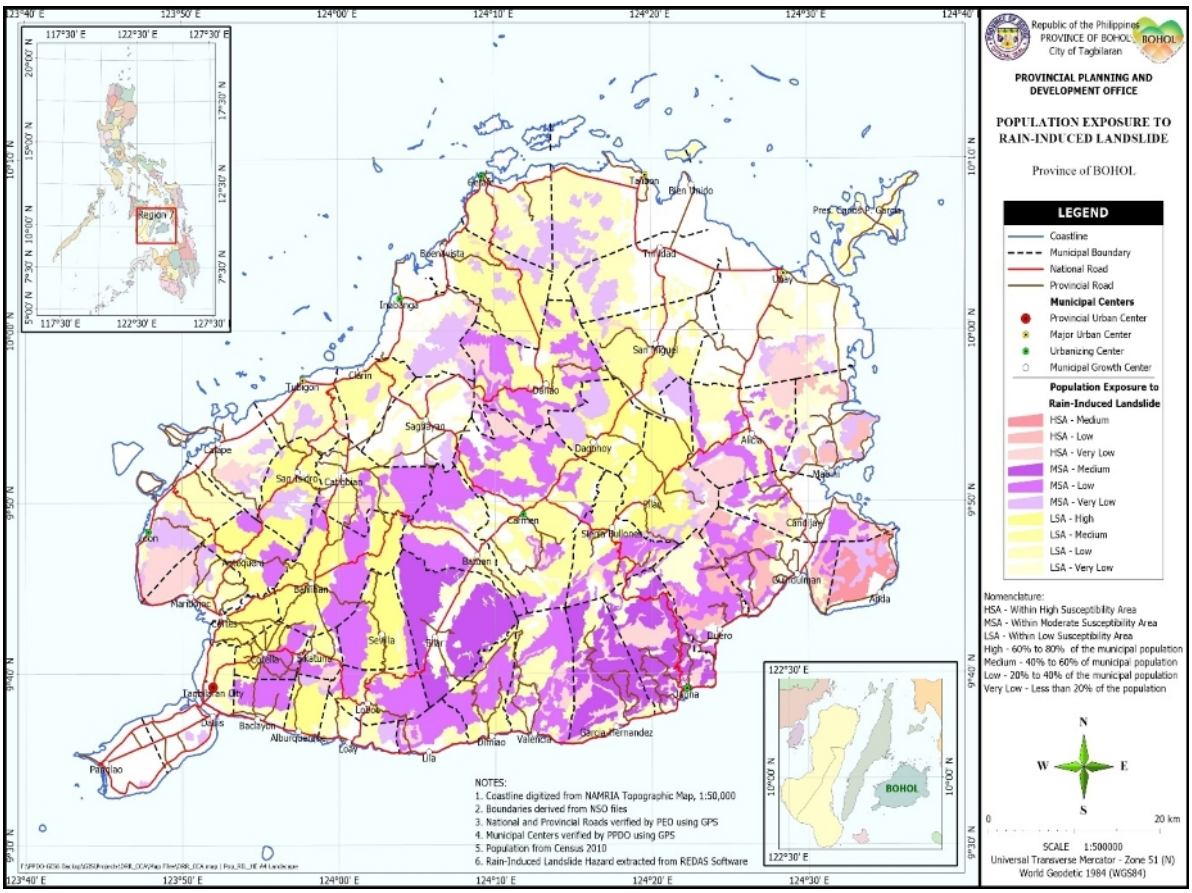
Table PE-6. **Population Exposure to Rain-induced Landslide by Municipality**
Bohol Province

Municipality	Municipal Population	Exposed Population				Population Exposure Percentage			
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	Possible Landslide Deposit Accumulation Zone	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	Possible Landslide Deposit Accumulation Zone
Alburquerque	9,921	136	723	6,662		1.374%	7.287%	67.153%	
Alicia	22,285	2,358	4,895	8,468	131	10.581%	21.964%	38.001%	0.588%
Anda	16,909	7,148	2,335		1,203	42.272%	13.810%		7.117%
Antequera	14,481		3,678	8,887			25.397%	61.372%	
Baclayon	18,630		5,341	4,497			28.668%	24.140%	
Balilihan	17,147	128	4,164	12,358	8	0.746%	24.283%	72.071%	0.047%
Batuan	12,431		4,341	4,842			34.918%	38.948%	
Bien Unido	25,796			7,253				28.118%	
Bilar	17,098		9,735	2,711			56.935%	15.855%	
Buenavista	27,031	623	1,628	11,686		2.305%	6.021%	43.232%	

Municipality	Municipal Population	Exposed Population				Population Exposure Percentage			
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	Possible Landslide Deposit Accumulation Zone	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	Possible Landslide Deposit Accumulation Zone
Calape	30,146	1,384	1,122	5,478		4.589%	3.722%	18.171%	
Candijay	29,043	3,299	5,984	6,164	297	11.358%	20.605%	21.224%	1.024%
Carmen	43,579	1,533	10,481	17,967		3.517%	24.050%	41.229%	
Catigbian	22,686	611	5,597	11,507	10	2.692%	24.674%	50.724%	0.046%
Clarin	20,296	603	494	11,970		2.970%	2.436%	58.978%	
Corella	7,699		2,529	4,973			32.851%	64.591%	
Cortes	15,294			11,305				73.919%	
Dagohoy	18,868	356	2,930	12,215		1.886%	15.527%	64.741%	
Danao	17,952	1,669	4,539	9,539		9.296%	25.283%	53.137%	
Dauis	39,448		2,126				5.389%		
Dimiao	15,166	219	4,940	8,400		1.446%	32.572%	55.390%	
Duero	17,580	3,613	6,566	1,272	663	20.554%	37.348%	7.236%	3.773%
G-Hernandez	23,038	2,708	10,203	5,940	345	11.753%	44.288%	25.782%	1.495%
Getafe	27,788	74	897	6,823		0.266%	3.228%	24.555%	
Guindulman	31,789	8,096	6,935	3,695	472	25.468%	21.817%	11.623%	1.485%
Inabanga	43,291	1,384	6,269	6,413		3.197%	14.480%	14.813%	
Jagna	32,566	6,018	14,226	3,133	325	18.478%	43.684%	9.622%	0.999%
Lila	11,985	1,257	4,494	2,806		10.488%	37.494%	23.410%	
Loay	16,261	113	1,518	4,879		0.695%	9.336%	30.006%	
Loboc	16,312	760	6,394	6,589		4.656%	39.196%	40.394%	
Loon	42,800	2,607	5,468	8,764		6.091%	12.775%	20.477%	
Mabini	28,174	5,887	4,828	5,098	747	20.894%	17.138%	18.093%	2.650%
Maribojoc	20,491	2,841	1,668	6,226	536	13.862%	8.140%	30.382%	2.617%
Panglao	28,603		212				0.740%		
Pilar	26,887	1,652	2,566	19,910	236	6.145%	9.542%	74.051%	0.878%
Pres. C. Garcia	23,287			7,317				31.422%	
Sagbayan	20,091	329	1,489	5,553	36	1.638%	7.410%	27.640%	0.182%
San Isidro	9,125	6	1,511	6,355		0.063%	16.557%	69.642%	
San Miguel	23,574	179	756	11,373		0.761%	3.205%	48.242%	
Sevilla	10,443		2,280	7,752			21.831%	74.229%	
Sierra Bullones	24,698	1,743	6,026	13,094		7.056%	24.400%	53.017%	
Sikatuna	6,380	694	1,366	3,403		10.884%	21.405%	53.345%	
Tagbilaran City	96,792		1,325	34,727			1.369%	35.878%	
Talibon	61,373		2,383	19,949			3.882%	32.505%	
Trinidad	28,828		1,312	6,205			4.552%	21.523%	

Municipality	Municipal Population	Exposed Population				Population Exposure Percentage			
		High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	Possible Landslide Deposit Accumulation Zone	High Susceptible Areas	Moderate Susceptible Areas	Low Susceptible Areas	Possible Landslide Deposit Accumulation Zone
Tubigon	44,902	585	1,994	12,721		1.303%	4.441%	28.331%	
Ubay	68,578	2,955	1,269	13,516	14	4.308%	1.851%	19.709%	0.020%
Valencia	27,586	2,726	9,267	9,814	347	9.882%	33.594%	35.576%	1.256%
T o t a l	**1,255,128**	**66,291**	**180,801**	**400,211**	**5,371**	**5.282%**	**14.405%**	**31.886%**	**0.428%**

Map PE-6. **Population Exposure Map to Rain-induced Landslide**
Bohol Province



Exposure of Built-up Areas to Hazards

Built-up Areas Exposed to Earthquake-induced Landslide

This exposure describes the extent of exposed built-up areas in Bohol to earthquake induced landslide per municipality. The Table below measures the exposure as expressed in terms of percentage to total municipal land allocation for built-up zones to determine the low, moderate and high built-up areas and assets exposure within the high susceptible hazard areas. For Bohol, the exposure dataset for built-up areas was derived from the land cover assessment from NAMRIA of 2010 which indicates the approximate extent of the built-up areas within the province.

The total allocation for built-up areas in the province is 8,633.98 hectares or 2.09 % of Bohol's total land area. Among the top 10 areas with big allocation are 1) Tagbilaran City (1,742.55), 2) Panglao (1,005.35), 3) Dauis (939.11), Candijay (437.33), 5) Baclayon (334.20), 6) Tubigon (234.73), 7) Jagna (196.93), 8) Loon (199.94), Anda (184.99) and 10) Buenavista (182.42). The City of Tagbilaran remains to be the primary urban center in Bohol, and it is followed by the three municipalities that are first class municipalities in the province, namely,Talibon, Ubay and Tubigon, the towns that are expected to experience rapid urbanization and to continue to play significant roles in the socio-economic development of the province. Moreover, growth is expected in other municipalities with ports and other infra-support facilities including those being developed or planned to be developed as growth centers like Loon, Ubay and Jagna.

As shown in the table below, 19 municipalities have very low exposure to moderately susceptible to earthquake induced landslide constituting a total area of 3.98 hectares or 0.047% to the total built-up of the province. Among them are Alburquerque, Alicia, Anda, Baclayon, Balilihan, Batuan, Candijay, Carmen, Corella, Cortes, Dauis, Duero, Garcia-Hernandez, Jagna, Lila, Loboc, Pilar, Sagbayan, Sevilla and Tagbilaran City. The remaining 29 municipalities are safe or not exposed to EIL

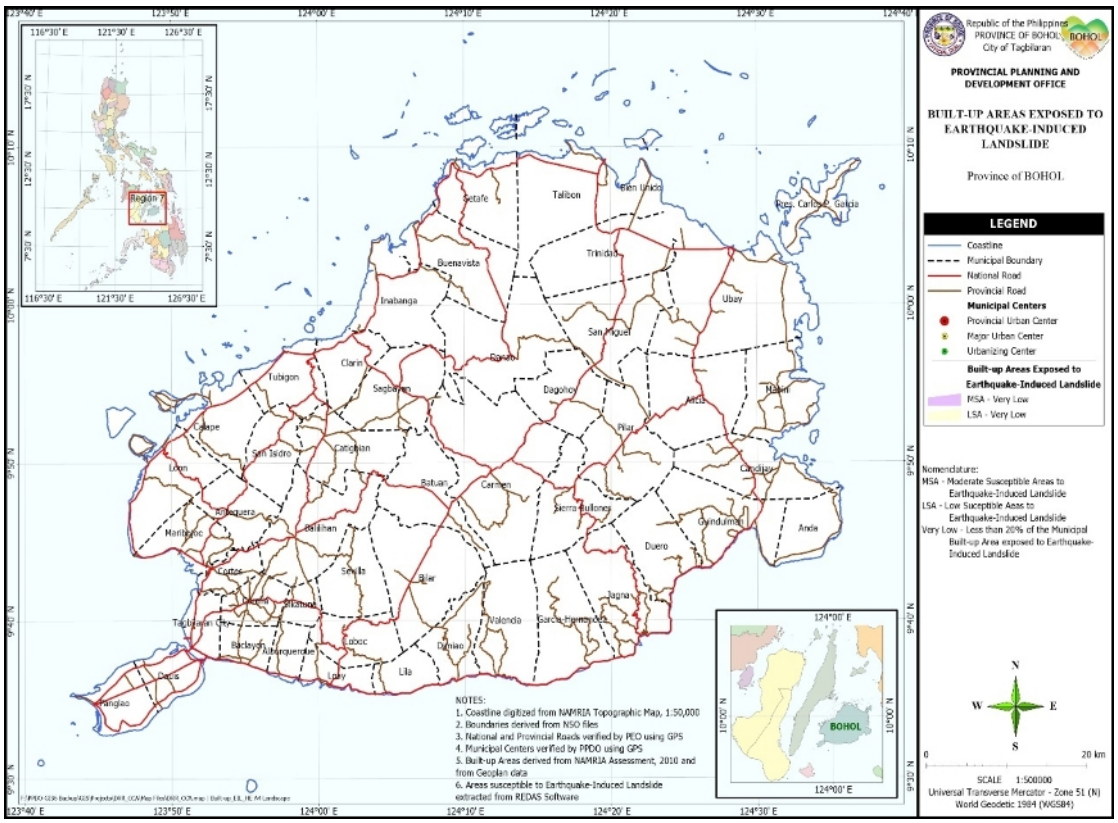
Table PE-7. **Built-Up Areas Exposed To Earthquake-Induced Landslide By Municipality**
Bohol Province

Municipality	Built-up Areas (Ha.)	Very Low Exposure		Low Susceptible Areas (Ha.)	
		Moderately Susceptible Areas (Ha.)	Low Susceptible Areas (Ha.)	Moderately Susceptible Areas (Ha.)	Low Susceptible Areas (Ha.)
Alburquerque	135.381	0.547	1.081	0.404%	0.798%

Municipality	Built-up Areas (Ha.)	Very Low Exposure		Low Susceptible Areas (Ha.)	
		Moderately Susceptible Areas (Ha.)	Low Susceptible Areas (Ha.)	Moderately Susceptible Areas (Ha.)	Low Susceptible Areas (Ha.)
Alicia	124.141	0.395	3.253	0.318%	2.621%
Anda	184.994	0.039	0.884	0.021%	0.478%
Antequera	30.118				
Baclayon	334.201	0.253	2.512	0.076%	0.752%
Balilihan	89.548	0.079	2.563	0.088%	2.863%
Batuan	50.448	0.155	3.316	0.307%	6.574%
Bien Unido	71.131				
Bilar	59.248				
Buenavista	182.419				
Calape	99.936				
Candijay	437.327	0.114	1.579	0.026%	0.361%
Carmen	160.512	0.017	0.806	0.010%	0.502%
Catigbian	26.494		1.327		5.007%
Clarin	148.345				
Corella	16.178		0.063		0.390%
Cortes	151.340	0.063	1.234	0.042%	0.815%
Dagohoy	51.327		0.455		0.887%
Danao	52.190				
Dauis	939.114	0.080	0.631	0.009%	0.067%
Dimiao	37.584		0.065		0.172%
Duero	156.249	0.039	0.451	0.025%	0.289%
Garcia-Hernandez	130.143	0.042	0.653	0.032%	0.502%
Getafe	82.271				
Guindulman	172.086		0.047		0.027%
Inabanga	97.366				
Jagna	196.926	0.409	3.070	0.208%	1.559%
Lila	20.336	0.089	0.663	0.438%	3.262%
Loay	134.404		1.324		0.985%
Loboc	93.786	0.354	2.372	0.378%	2.529%
Loon	194.657				
Mabini	69.887				
Maribojoc	69.845				
Panglao	1,005.348				
Pilar	85.271	0.002	0.992	0.003%	1.163%
Pres. C.P. Garcia	62.144				

Municipality	Built-up Areas (Ha.)	Very Low Exposure		Low Susceptible Areas (Ha.)	
		Moderately Susceptible Areas (Ha.)	Low Susceptible Areas (Ha.)	Moderately Susceptible Areas (Ha.)	Low Susceptible Areas (Ha.)
Sagbayan	43.632	0.004	0.082	0.009%	0.187%
San Isidro	40.952		0.279		0.682%
San Miguel	27.644				
Sevilla	87.486	1.568	5.627	1.793%	6.432%
Sierra Bullones	83.235	0.000	3.941	0.001%	4.734%
Sikatuna	20.810		0.043		0.209%
Tagbilaran City	1,742.559	0.283	2.519	0.016%	0.145%
Talibon	114.171				
Trinidad	38.241				
Tubigon	234.735		1.482		0.631%
Ubay	177.482				
Valencia	70.333		0.651		0.925%
T o t a l	**8,498.596**	**3.985**	**42.884**	**0.047%**	**0.505%**

Map PE-7. **Built-up Areas Exposure Map to Earthquake-induced Landslide**
Bohol Province



Built-up Areas Exposed to Ground Shaking Hazard

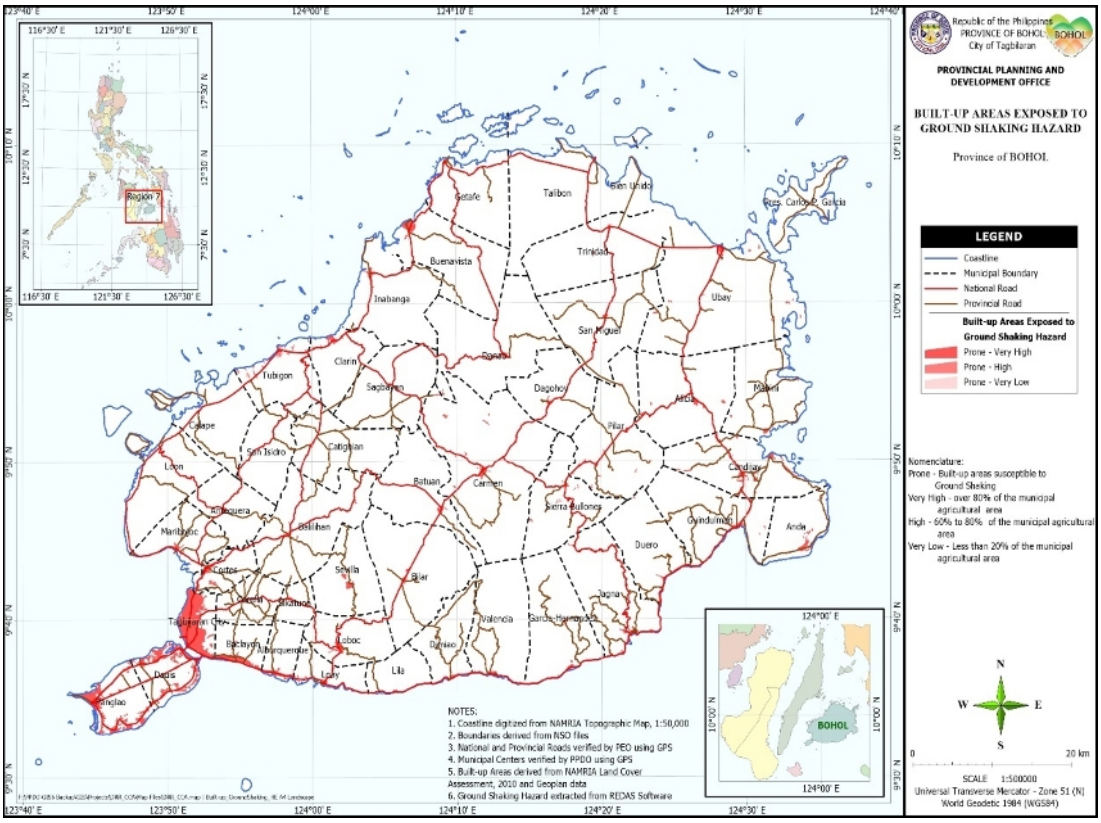
Of the 47 municipalities and its city, about 7,739.84 hectares or 89.64% of the total built-up allocation in Bohol (8,633.98 hectares) are exposed to ground shaking with Intensity 8. Tagbilaran City has the biggest areas (1,742 hectares or 99.72%) of exposure to ground shaking, followed by Panglao (975.73 or 97.05%) and Dauis (939.14 or 89.97%).

Table PE-8. **Built-Up Areas Exposed To Ground Shaking Per Municipality Bohol Province**

Municipality	Municipal Built-up Area (Ha.)	Built-up Areas Prone to Ground Shaking (Ha.)	Percentage of Built-up Areas Prone to Ground Shaking
Alburquerque	135.381	135.145	99.825%
Alicia	124.141	124.141	100.000%
Anda	184.994	184.586	99.779%
Antequera	30.118	28.658	95.155%
Baclayon	334.201	318.008	95.155%
Balilihan	89.548	89.548	100.000%
Batuan	50.448	50.448	100.000%
Bien Unido	71.131		
Bilar	59.248	59.248	100.000%
Buenavista	182.419	180.110	98.734%
Calape	99.936		
Candijay	437.327	435.863	99.665%
Carmen	160.512	160.512	100.000%
Catigbian	26.494	24.932	94.105%
Clarin	148.345	120.387	81.154%
Corella	16.178	16.178	100.000%
Cortes	151.340	151.340	100.000%
Dagohoy	51.327	51.327	100.000%
Danao	52.190	52.190	100.000%
Dauis	939.114	844.922	89.970%
Dimiao	37.584	37.584	99.999%
Duero	156.249	148.683	95.158%
Garcia-Hernandez	130.143	129.764	99.709%
Getafe	82.271	77.179	93.811%
Guindulman	172.086	169.778	98.659%
Inabanga	97.366	97.311	99.943%
Jagna	196.926	191.916	97.456%
Lila	20.336	20.335	99.996%
Loay	134.404	133.020	98.970%
Loboc	93.786	93.786	100.000%
Loon	194.657		
Mabini	69.887	69.575	99.554%
Maribojoc	69.845	60.762	86.995%

Municipality	Municipal Built-up Area (Ha.)	Built-up Areas Prone to Ground Shaking (Ha.)	Percentage of Built-up Areas Prone to Ground Shaking
Panglao	1,005.348	975.734	97.054%
Pilar	85.271	85.271	100.000%
Pres. Carlos P. Garcia	62.144	9.126	14.684%
Sagbayan	43.632		
San Isidro	40.952		
San Miguel	27.644	27.644	100.000%
Sevilla	87.486	87.486	100.000%
Sierra Bullones	83.235	83.235	100.000%
Sikatuna	20.810	20.810	100.000%
Tagbilaran City	1,742.559	1,742.073	99.972%
Talibon	114.171	0.853	0.747%
Trinidad	38.241	33.249	86.944%
Tubigon	234.735	183.962	78.370%
Ubay	177.482	162.299	91.445%
Valencia	70.333	70.329	99.994%
T o t a l	**8,633.977**	**7,739.307**	**89.638%**

Map PE-8. **Built-up Areas Exposure Map to Ground Shaking**
Bohol Province



Built-up areas Exposed to Tsunami

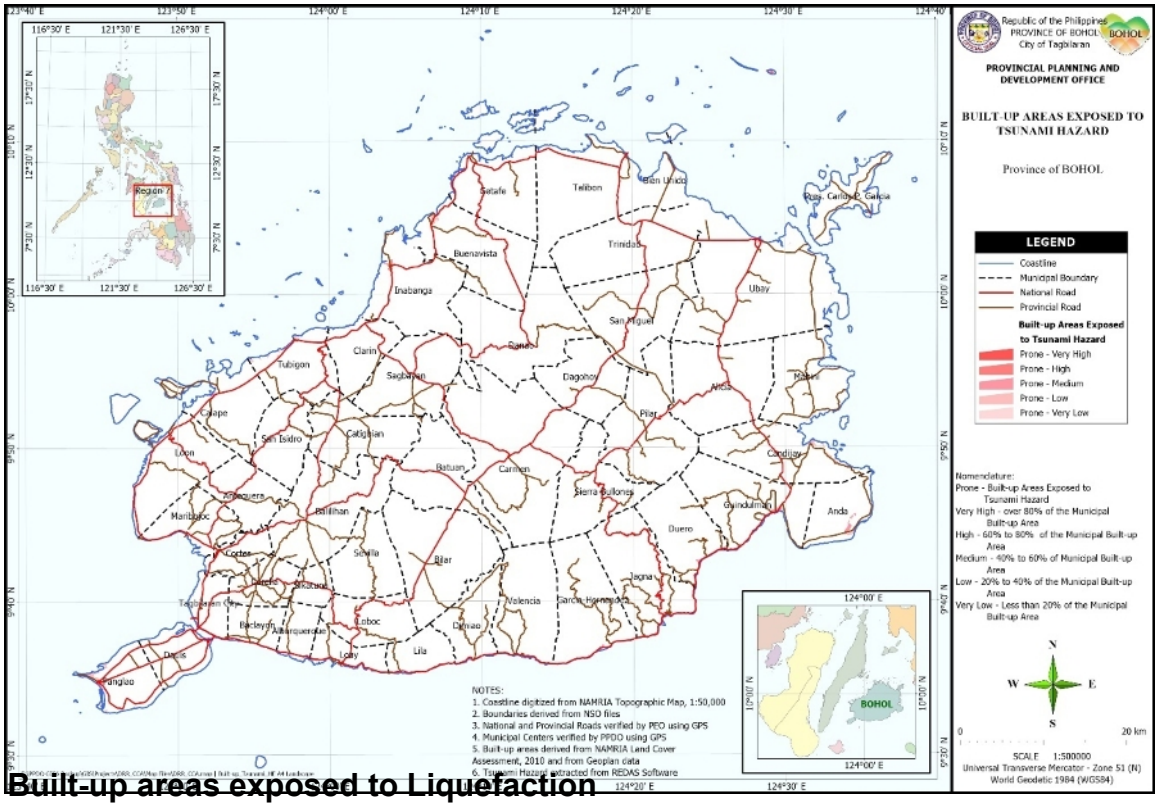
A total of 1,359.66 or 15.75% of the built-up areas of Bohol are exposed to tsunami. It can be found in the municipalities of Alburquerque, Anda, Baclayon, Bien Unido, Buenavista, Calape, Candijay, Clarin, Cortes, Dauis, Dimiao, Duero, Garcia-Hernandez, Getafe, Guindulman, Inabanga, Jagna, Lila, Loay, Loboc, Loon, Mabini, Maribojoc, Pres. C. P. Garcia, Tagbilaran City, Talibon, Tubigon, Ubay and Valencia. Municipalities that are safe to tsunami hazard are Alicia, Antequera, Balilihan, BAtuan, Bilar, Carmen, Catigbian, Corella, Dagohoy, Danao, Pilar, Sagbayan, San Miguel, San Isidro, Sevilla, Sierra-Bullones, Sikatuan and Trinidad.

Table PE-9. **Built-Up Areas Exposed to Tsunami Hazard by Municipality**
Bohol Province

Municipality	Municipal Built-up Area (Ha.)	Municipal Built-up Area Exposed to Tsunami Hazard (Ha.)	Percentage of Municipal Built-up Area Exposed to Tsunami Hazard
Alburquerque	135.381	26.319	19.441%
Alicia	124.141		
Anda	184.994	102.722	55.527%
Antequera	30.118		
Baclayon	334.201	22.766	6.812%
Balilihan	89.548		
Batuan	50.448		
Bien Unido	71.131	60.428	84.954%
Bilar	59.248		
Buenavista	182.419	53.521	29.340%
Calape	99.936	34.543	34.565%
Candijay	437.327	90.509	20.696%
Carmen	160.512		
Catigbian	26.494		
Clarin	148.345	8.414	5.672%
Corella	16.178		
Cortes	151.340	4.199	2.774%
Dagohoy	51.327		
Danao	52.190		
Dauis	939.114	36.621	3.900%
Dimiao	37.584	15.097	40.168%
Duero	156.249	87.423	55.951%
Garcia-Hernandez	130.143	52.570	40.394%
Getafe	82.271	13.025	15.832%
Guindulman	172.086	69.768	40.542%
Inabanga	97.366	65.670	67.446%
Jagna	196.926	91.554	46.492%
Lila	20.336	1.237	6.084%
Loay	134.404	44.414	33.045%
Loboc	93.786	0.061	0.065%

Municipality	Municipal Built-up Area (Ha.)	Municipal Built-up Area Exposed to Tsunami Hazard (Ha.)	Percentage of Municipal Built-up Area Exposed to Tsunami Hazard
Loon	194.657	11.011	5.657%
Mabini	69.887	12.273	17.562%
Maribojoc	69.845	10.879	15.575%
Panglao	1,005.348	230.005	22.878%
Pilar	85.271		
Pres. Carlos P. Garcia	62.144	32.001	51.495%
Sagbayan	43.632		
San Isidro	40.952		
San Miguel	27.644		
Sevilla	87.486		
Sierra Bullones	83.235		
Sikatuna	20.810		
Tagbilaran City	1,742.559	18.086	1.038%
Talibon	114.171	28.079	24.594%
Trinidad	38.241		
Tubigon	234.735	48.911	20.837%
Ubay	177.482	62.227	35.061%
Valencia	70.333	25.324	36.006%
T o t a l	**8,633.977**	**1,359.661**	**15.748%**

Map PE-9. **Built-up Areas Exposure Map to Tsunami**
Bohol Province



Built-up areas exposed to Liquefaction

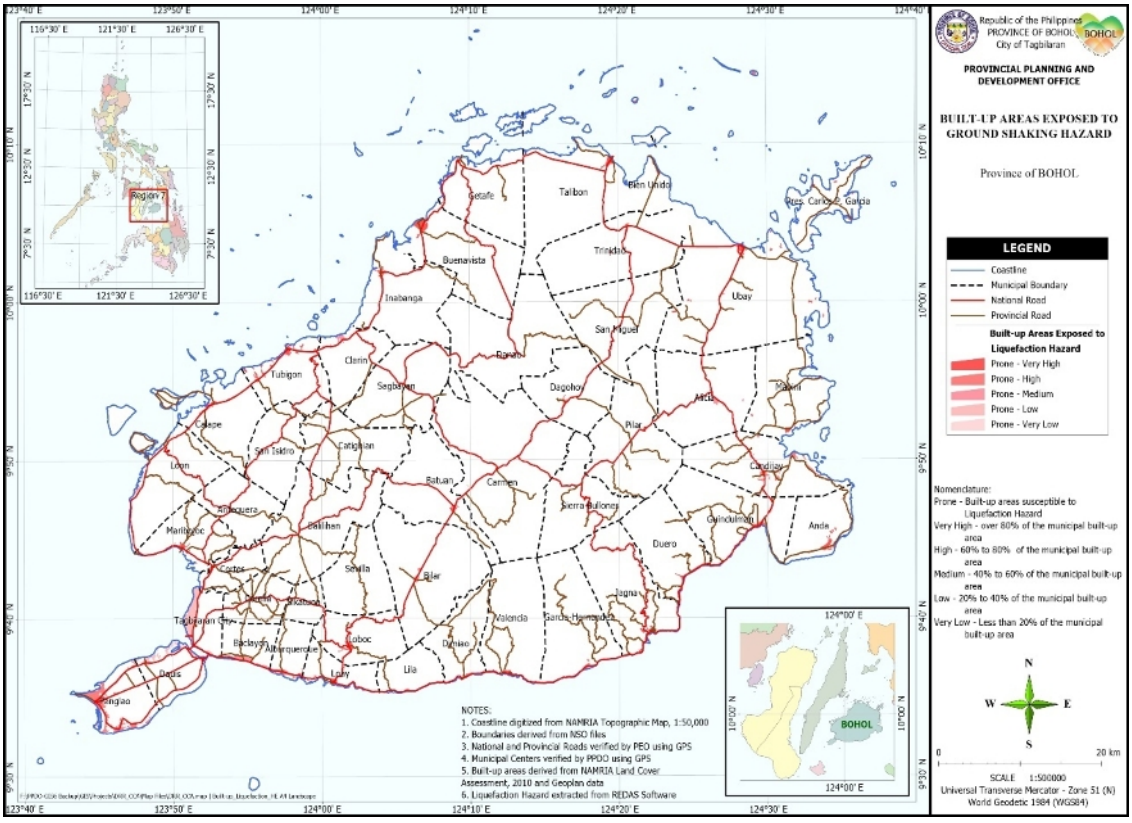
The built-up areas of the thirty-seven municipalities and 1-city are highly exposed to liquefaction hazard with 4,951.39 hectares or roughly 57.35% of the total areas allocated for built-up. Panglao (803.25 hectares) and Tagbilaran City (609.67 hectares) has the biggest area exposed to liquefaction followed by Candijay (341.63 has), Dauis (282.59 has) and Tubigon (205.36 has). Eleven municipalities are safe from liquefaction exposure (Antequera, Balilihan, Catigbian, Corella, Danao, Sagbayan, San Isidro, San Miquel, Sevilla, Sierra Bullones and Sikatuna).

Table PE-10. **Built-Up Areas Exposed To Liquefaction Hazard Per Municipality**
Bohol Province

Municipality	Municipal Built-up Area (Ha.)	Built-up Areas Exposed to Liquefaction Hazard (Ha.)	Percentage of Municipal Built-up Areas Exposed to Liquefaction Hazard
Alburquerque	135.381	101.035	74.630%
Alicia	124.141	63.405	51.075%
Anda	184.994	176.262	95.280%
Antequera	30.118		
Baclayon	334.201	175.499	52.513%
Balilihan	89.548		
Batuan	50.448	45.821	90.827%
Bien Unido	71.131	65.944	92.708%
Bilar	59.248	44.645	75.353%
Buenavista	182.419	180.955	99.197%
Calape	99.936	98.987	99.050%
Candijay	437.327	341.625	78.117%
Carmen	160.512	5.719	3.563%
Catigbian	26.494		
Clarin	148.345	79.665	53.702%
Corella	16.178		
Cortes	151.340	42.480	28.069%
Dagohoy	51.327	40.985	79.852%
Danao	52.190		
Dauis	939.114	282.590	30.091%
Dimiao	37.584	30.444	81.002%
Duero	156.249	143.739	91.993%
Garcia-Hernandez	130.143	87.526	67.254%
Getafe	82.271	56.707	68.927%

Municipality	Municipal Built-up Area (Ha.)	Built-up Areas Exposed to Liquefaction Hazard (Ha.)	Percentage of Municipal Built-up Areas Exposed to Liquefaction Hazard
Guindulman	172.086	157.939	91.779%
Inabanga	97.366	86.601	88.944%
Jagna	196.926	158.172	80.321%
Lila	20.336	19.198	94.405%
Loay	134.404	120.713	89.813%
Loboc	93.786	78.735	83.951%
Loon	194.657	80.283	41.243%
Mabini	69.887	56.166	80.368%
Maribojoc	69.845	66.641	95.413%
Panglao	1,005.348	803.251	79.898%
Pilar	85.271	12.899	15.127%
Pres. Carlos P. Garcia	62.144	60.332	97.084%
Sagbayan	43.632		
San Isidro	40.952		
San Miguel	27.644		
Sevilla	87.486		
Sierra Bullones	83.235		
Sikatuna	20.810		
Tagbilaran City	1,742.559	609.674	34.987%
Talibon	114.171	99.982	87.572%
Trinidad	38.241	33.249	86.944%
Tubigon	234.735	205.358	87.485%
Ubay	177.482	170.863	96.270%
Valencia	70.333	67.303	95.691%
T o t a l	**8,633.977**	**4,951.392**	**57.348%**

Map PE-10. **Built-up Areas Exposure Map to Liquefaction**
Bohol Province



Built-up areas exposed to Storm Surge

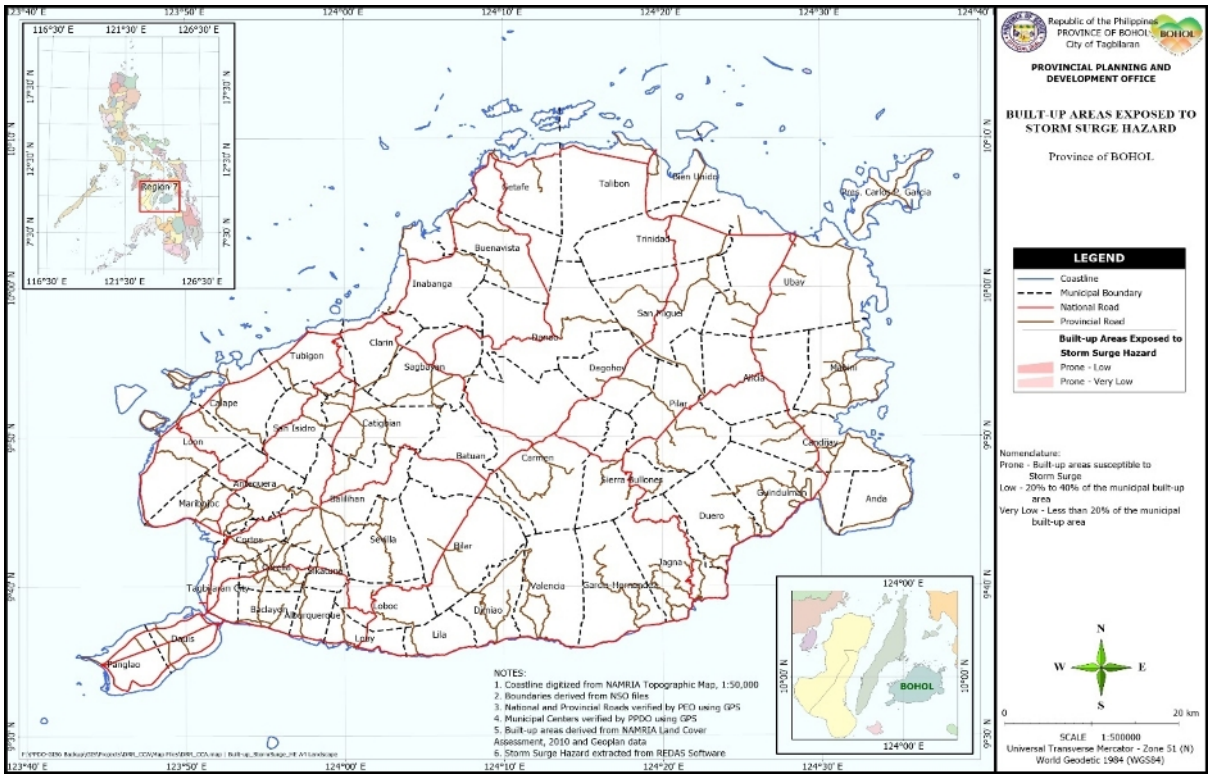
Of the total built-up areas in the province, a portion of 359.28 hectares or 4.16% are highly exposed to liquefaction. These areas can be found the coastal towns of Alburquerque, Anda, Baclayon, Bien Unido, Buenavista, Calape, Candijay, Clarin, Dauis, Dimiao, Duero, Garcia-Hernandez, Getafe, Guindulman, Inabanga, Jagna, Lila, Loboc, Loon, Mabini, Maribojoc, Panglao, Pres. C.P. Garcia, Tagbilaran City, Talibon, Tubigon, Ubay and Valencia. Seventeen hinterland municipalities are not exposed to liquefaction.

Table PE-11. **Built-Up Areas Exposed To Storm Surge Hazard By Municipality**
Province of Bohol

Municipality	Municipal Built-up Area (Ha.)	Municipal Built-up Area Exposed to Storm Surge Hazard (Ha.)	Percentage of Municipal Built-up Area Exposed to Storm Surge Hazard
Alburquerque	135.381	11.898	8.788%
Alicia	124.141		
Anda	184.994	11.374	6.148%
Antequera	30.118		
Baclayon	334.201	23.359	6.989%
Balilihan	89.548		
Batuan	50.448		

Municipality	Municipal Built-up Area (Ha.)	Municipal Built-up Area Exposed to Storm Surge Hazard (Ha.)	Percentage of Municipal Built-up Area Exposed to Storm Surge Hazard
Bien Unido	71.131	26.644	37.458%
Bilar	59.248		
Buenavista	182.419	4.500	2.467%
Calape	99.936	1.399	1.400%
Candijay	437.327	4.870	1.114%
Carmen	160.512		
Catigbian	26.494		
Clarin	148.345	2.633	1.775%
Corella	16.178		
Cortes	151.340		
Dagohoy	51.327		
Danao	52.190		
Dauis	939.114	0.014	0.001%
Dimiao	37.584	2.280	6.067%
Duero	156.249	29.031	18.580%
Garcia-Hernandez	130.143	12.242	9.407%
Getafe	82.271	11.457	13.926%
Guindulman	172.086	15.765	9.161%
Inabanga	97.366	4.326	4.443%
Jagna	196.926	22.134	11.240%
Lila	20.336	4.024	19.789%
Loay	134.404	15.026	11.180%
Loboc	93.786		
Loon	194.657	2.931	1.506%
Mabini	69.887	2.847	4.074%
Maribojoc	69.845	2.977	4.262%
Panglao	1,005.348	72.052	7.167%
Pilar	85.271		
Pres. Carlos P. Garcia	62.144	12.580	20.244%
Sagbayan	43.632		
San Isidro	40.952		
San Miguel	27.644		
Sevilla	87.486		
Sierra Bullones	83.235		
Sikatuna	20.810		
Tagbilaran City	1,742.559	10.438	0.599%
Talibon	114.171	23.100	20.233%
Trinidad	38.241		
Tubigon	234.735	3.816	1.626%
Ubay	177.482	15.087	8.500%
Valencia	70.333	10.474	14.892%
T o t a l	**8,633.977**	**359.279**	**4.161%**

Map PE-11. **Built-up Areas Exposure Map to Storm Surge**
Bohol Province



Built-up areas exposed to Rain-induced Landslide (RIL)

There are 8,633.98.54 hectares of municipal built-up areas or 2.09% of the total area in Bohol. Four municipalities (Anda, Garcia-Hernandez, Guindulman and Jagna) constituting an area of 7.81 hectares are exposed to highly susceptible RIL. While 17 municipalities are exposed to moderate RIL with 95.30 hectares and 1,558.6 hectares are low susceptible. Anda has the biggest area (5.92 has.) exposed to high susceptibility, followed by Jagna (1.43 has) Candijay, Dagohoy, Duero, Loboc, Loon, Maribojoc, Sikatuna, and Valencia all have areas ranging from 0.3 hectare but less than 10 hectares. The municipalities of Bilar, Buenavista, Calape, Catigbian, Lila and San Miguel have no built-up areas within highly susceptible nor moderately susceptible areas.

Ta

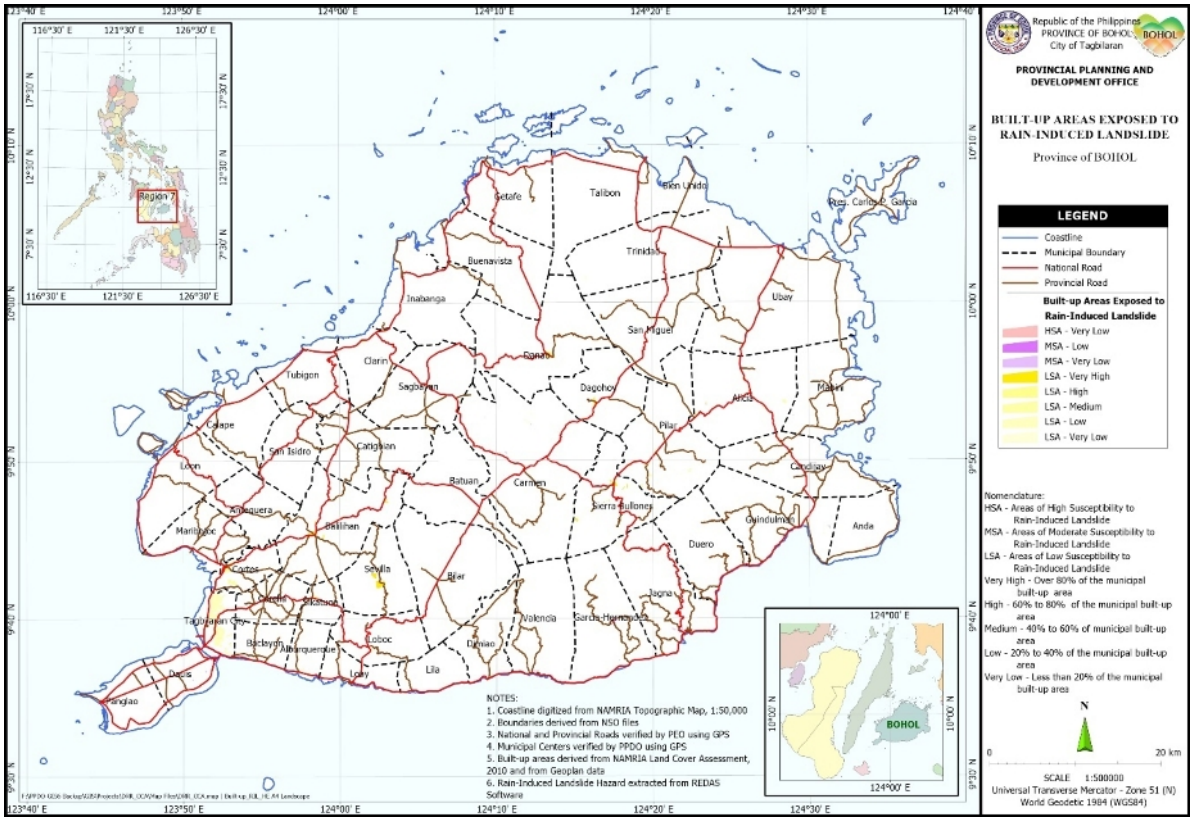
Table PE-12. **Built-Up Areas Exposed To Rain-Induced Landslide Per Municipality**

Bohol Province

Municipality	Municipal Built-up Area (Ha.)	Built-up Area			Percentage of Municipal Built-up Area		
		Highly Susceptible to Rain-Induced Landslide (Ha.)	Moderately Susceptible to Rain-Induced Landslide (Ha.)	Lowly Susceptible to Rain-Induced Landslide (Ha.)	Highly Susceptible to Rain-Induced Landslide (Ha.)	Moderately Susceptible to Rain-Induced Landslide (Ha.)	Lowly Susceptible to Rain-Induced Landslide (Ha.)
Alburquerque	135.38			19.72			14.567%
Alicia	124.14		1.82	64.03		1.464%	51.580%
Anda	184.99	5.92	0.76		3.198%	0.411%	
Antequera	30.12			4.20			13.958%
Baclayon	334.20		11.54	3.95		3.453%	1.183%
Balilihan	89.55			83.06			92.755%
Batuan	50.45			3.43			6.806%
Bien Unido	71.13			12.32			17.319%
Bilar	59.25						
Buenavista	182.42						
Calape	99.94						
Candijay	437.33	0.00	0.16	65.39	0.001%	0.037%	14.953%
Carmen	160.51		3.28	15.37		2.045%	9.573%
Catigbian	26.49						
Clarin	148.35			44.18			29.785%
Corella	16.18			16.18			100.000%
Cortes	151.34			108.76			71.866%
Dagohoy	51.33			41.31			80.475%
Danao	52.19			44.83			85.895%
Dauis	939.11		3.32			0.354%	
Dimiao	37.58			8.72			23.194%
Duero	156.25		6.93	3.76		4.436%	2.405%
Garcia-Hernandez	130.14	0.43	33.23	8.96	0.330%	25.537%	6.888%
Getafe	82.27			7.06			8.579%

Municipality	Municipal Built-up Area (Ha.)	Built-up Area			Percentage of Municipal Built-up Area		
		Highly Susceptible to Rain-Induced Landslide (Ha.)	Moderately Susceptible to Rain-Induced Landslide (Ha.)	Lowly Susceptible to Rain-Induced Landslide (Ha.)	Highly Susceptible to Rain-Induced Landslide (Ha.)	Moderately Susceptible to Rain-Induced Landslide (Ha.)	Lowly Susceptible to Rain-Induced Landslide (Ha.)
Guindulman	172.09	0.03	2.57	2.31	0.016%	1.494%	1.342%
Inabanga	97.37			0.82			0.843%
Jagna	196.93	1.43	13.88	25.04	0.728%	7.047%	12.717%
Lila	20.34						
Loay	134.40			8.30			6.174%
Loboc	93.79			15.34			16.357%
Loon	194.66		6.04	0.71		3.104%	0.365%
Mabini	69.89		6.43	1.20		9.202%	1.710%
Maribojoc	69.84			2.64			3.774%
Panglao	1,005.35		0.98			0.097%	
Pilar	85.27		0.25	58.61		0.297%	68.738%
Pres. C. P. Garcia	62.14			12.97			20.877%
Sagbayan	43.63			7.77			17.801%
San Isidro	40.95			14.93			36.449%
San Miguel	27.64						
Sevilla	87.49		1.19	86.29		1.364%	98.636%
Sierra Bullones	83.23			67.47			81.062%
Sikatuna	20.81			15.98			76.814%
Tagbilaran City	1,742.56		0.28	635.18		0.016%	36.451%
Talibon	114.17			15.32			13.421%
Trinidad	38.24			4.99			13.056%
Tubigon	234.73			15.41			6.563%
Ubay	177.48			10.28			5.789%
Valencia	70.33		2.62	1.89		3.725%	2.690%
T o t a l	**8,633.98**	**7.81**	**95.30**	**1,558.69**	**0.090%**	**1.104%**	**18.053%**

Map PE-12. **Built-up Areas Exposure Map to Rain-induced Landslide**
Bohol Province



Present Initiatives to Address Climate Change Concerns

Climate Change and ***Disaster Risk Reduction*** are closely interrelated and effective disaster risk reduction will enhance climate change adaptive capacity, the State shall integrate disaster risk reduction into climate change programs and initiatives. Cognizant of the need to ensure that national and subnational government policies, plans, programs and projects are founded upon sound environmental considerations and the principle of sustainable development, it is hereby declared the policy of the State to systematically integrate the concept of climate change in various phases of policy formulation, development plans, poverty reduction strategies and other development tools and techniques by all agencies and instrumentalities of the government.

PGBh thru PPDO provided technical assistance in mainstreaming DRR-CC in the updating of their CLUPs and CDPs (28 0ut of 48 LGUs). Ongoing PGBh inter-local government unit collaboration in the conduct of climate- related activities with CCC-OP, DFAT-ANU-Australia, NEDA, Rockfeller Foundation, UNDP, World Bank, Philippine Australian Scholars, Bohol Island State Universities, Academe, Business Sector and NGOs eg. Conduct of Bohol 1st Climate Change Summit, Capacity Assessment Training for Trainers' (TOT) Course Mechanics, ecoTown Product-Climate Proofing, Strengthening Capacity Development of the 5-Provinces for climate Change Adaptation and ICLEI – ACCCRN project to build resiliency to climate change across all urban systems and groups, in particular the poorest and

the most marginalized and it further aims to catalyze attention, funding and action to strengthen cities resilience to climate change impacts.

Regular budget allocated for CCA initiatives. Allocation from their annual appropriations adequate funds for the formulation, development and implementation, including training, capacity building and direct intervention, of their respective climate change programs and plans.

On going implementation of Environmental Management System (ISO 14001) involving all PGBh offices e.g measures on energy saving, waste reduction, health prevention and pollution control, etc. Conduct public awareness campaigns on the effects of climate change and energy-saving solutions to mitigate these effects, and initiatives, through educational and training programs and micro-credit schemes, especially for women in rural areas.

Vulnerability Assessment

Vulnerability Assessment is a systematic examination of impacts of climate change and disasters on natural and socio-economic systems (IPCC 2007) that examines the underlying socio-economic, institutional, and, to a lesser extent, political and cultural factors, that determine how people cope with climate hazards. It makes use of vulnerability indicators from different sectors e.g. sensitivity, exposure and adaptive capacity that can help identify and target vulnerable sectors or populations, raise awareness, and are part of a monitoring strategy (Downing et al. 2001). The elements at risk to population, built-up areas, agriculture, forestry which focus on the rain-induced landslide assessment.

FORESTRY

Population growth and economic activities have created pressures on Bohol's environment and natural resources. High demand for physical infrastructure like roads, water systems and power, settlement areas as well as greater demand for goods and services are expected to add pressure on its environment that are looked upon as major necessities for the province's development but often create environmental stress. Such developments in the province need to pro-actively integrate DRR-CCA mechanisms to prevent adverse impact on the critical resources and exposure of people and property to danger. Environmentally constrained areas are prone to natural hazards, severe erosion or more specifically, hydrological and geological produced changes. The NIPAS Law does not cover these areas. However, they should be subject to restrictions in land uses in order to prevent the unpredictable occurrence of disaster both natural and man-made that will endanger lives and properties (refer Annex Map Development Constrained Areas in the province of Bohol).

Nature Protection and Landscape Management. The latest data shows that Bohol has a total area of 75,766 hectares under protection as initial component of the National Integrated Protected Area System's (NIPAS Act or RA 7586) that are Environmentally Constrained and Environmentally Critical Areas. Protection purposes are for the conservation of biological diversity (flora and fauna) and natural heritage areas, conservation of forest cover, as well as provision for livelihood opportunities, water conservation and sustainable development for those living in and around these areas. All development within these areas shall follow the provision embodied in the NIPAS Law and they should be subject to restrictions in land uses in order to prevent the occurrences of accidents that endanger lives and properties.

BIODIVERSITY

Bohol is richly endowed with vast biodiversity and natural resources that plays an essential role in guiding future development for agriculture, industry, tourism, settlements, culture and infrastructure in both the medium and long-term time frame. The state of the economy and the quality of life in any given area are extremely dependent on climate, air, land, water, forest, marine ecosystems and biological resources. The management of Bohol's ecosystem is supported with a Provincial Ordinance known as the Bohol Environment Code which provides for the policy direction and funding requirements in local environmental management and protection for the province. It is important that policy-makers are well-informed on the relevant concerns confronting environment issues.

COASTAL AND MARINE

Vulnerability Assessment of the Coastal Tourism to Impacts of Climate Change in Bohol. The total population in the coastal area of Bohol comprises 42 percent of its provincial population in 2010 compared to 28 percent in 1990. Of the total coastal population, 12 percent of the province's populace were residing in the island barangays of Bohol.

The study was conducted by Ms. Hyacinth N. Suarez from the College of Arts and Sciences, Holy Name University, Tagbilaran City pertaining to the vulnerability of the coastal tourism in Island Province of Bohol specifically in Panglao to impacts of climate change. There are five (5) climate change impacts were predetermined during the study: storm surge inundation, 5-meters sea level rise, seawater intrusion, coral bleaching and health issue (e.g. dengue). Combining all the climate change impacts, the average degree or level of risk is high. The challenge for the municipalities of the province is how to improve or sustain the adaptive capacity to enhance preparedness or resiliency over time.

Vulnerability Assessment (VA) Index

The VA index was derived from the weighted average per municipality from the sensitivity value multiplied the sensitivity indicator plus the exposure value multiplied by the exposure indicator plus the exposure value multiplied by the adaptive capacity. The result of the exercise was based on the one the flooding hazard which

would affect greatly to forestry, coastal/marine, mining, agricultural lands, and biodiversity. It is expressed using the formula:

VA Index = the sum of the weighted average (sensitivity value x sensitivity indicator) + (exposure value x exposure indicator) + (exposure value x adaptive capacity)

Sensitivity indicators include the rainfall data, slope, proximity of farm to river and forest cover while the sensitivity indicators weight has a value of 1.0 distributed to the number of indicators.

Exposure indicators include the flooded area for production, no flooding for 3-years, income loss and estimated value of dam with exposure value weight of 1.0 distributed to the number of indicators.

Adaptive capacity indicators include the presence of maps, history of flooding, flood control and drainage devices, plans/budget, enforcement and regulations, etc. with assigned adaptive capacity weight of 1.0 distributed to the number of indicatiors.

After getting the average weighted percentage, Bohol has eight (8) municipalities which are very low to vulnerability index, 34 municipalities are low; and six (6) municipalities are moderate (refer to Table PE-29 below). This information is very important in prioritizing climate change related interventions, policies strategies that will be integrated in the enhanced PDPFP for Bohol.

Vulnerability Category	Number of Municipalities	Name of Municipalities
Very low	8	Anda, Batuan, Bilar, Corella, Lila, Panglao, Tagbilaran City, Ubay
Low	34	Alburquerque, Alicia, Antequera, Baclayon, Balilihan, Bien Unido, Buenavista, Calape, Candijay, Carmen, Catigbian, Clarin, Cortes, Dagohoy, Danao, Dauis, Dimiao, Duero, Garcia-Hernandez, Guindulman, Inabanga, Jagna, Getafe, Loay, Loboc, Loon, Mabini, Maribojoc, Pres. C. P. Garcia, San Miguel, Sevilla, Sikatuna, Talibon, Trinidad
Moderate	6	Pilar, Sagbayan, San Isidro, Sierra-Bullones, Tubigon, Valencia
T o t a l	**48**	

- **Land Use Potentials and Constraints**

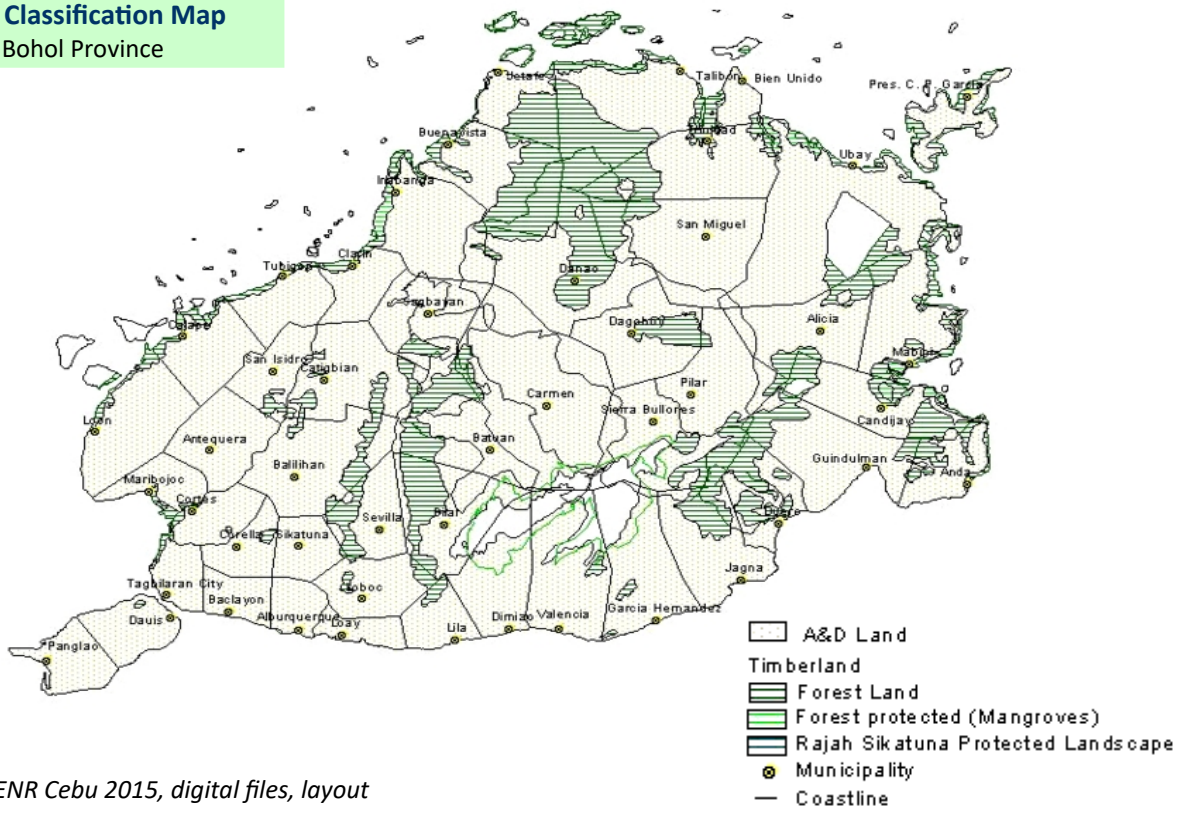
Land Classification[5]

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

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 *(Table __-Annex 1)*. About 75% are classified as alienable and disposable (A & D) land. The total area devoted to agricultural use is 273,950 hectares or 45 percent of the total land area of the province. Of the total agricultural area, 50 percent or 156,944 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.

Map PE-20
Land Classification Map
Bohol Province



Source: *DENR Cebu 2015, digital files, layout edited*

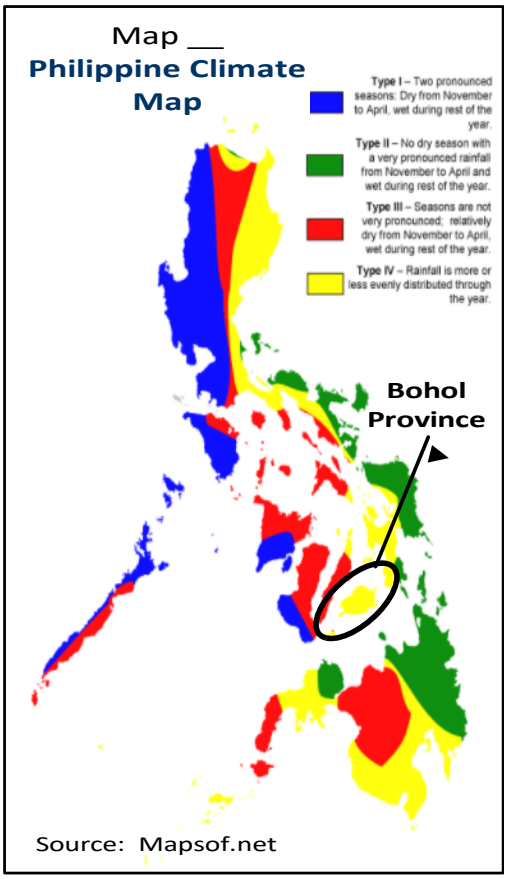
Climate of the Province

Climate Profile

The effects of climate change are now being felt in the Province of Bohol. Impact of this change has affected Bohol's forest, its biodiversity, water, agricultural, fishery resources and cultural assets with wide-range adverse impact on human health and loss of life. The ten (10) warmest years on record in the world all occurred in the years 1880 to 2000 (Figure 1). Temperature changes are known to affect the transmission of infectious diseases like malaria, dengue and respiratory tract infections. Rising incidence of morbidity cases from these infectious diseases, particularly respiratory tract infections has been recorded in Bohol with pneumonia as a leading cause of illness in the province affecting 10% of Bohol's population in 2015, mostly children.

Figure 1.

Based on the distribution of rainfall during the year, Bohol's climate, as classified by PAG-ASA belongs to Corona's 4th Type, characterized by rainfall more or less evenly distributed throughout the year. The rainfall varies from about 1,200 mm/yr around the coast to slightly more than 2,200 mm/yr in the mountainous areas of the province. Based on the climatogical records of the Tagbilaran City weather station, the province has an annual average of 161 rainy days. The average rainfall has 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. Intensification of the southwest monsoon usually occurs during the months of July to October. 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 centigrade. Prevailing wind direction is towards northeast with an average speed of 2 miles, per record



obtained from PAG-ASA. Prevailing wind direction is towards northeast with an average speed of 2 miles per record. Bohol is not included in the so-called typhoon belt of the country, as typhoons rarely pass in the province. Those passing below or above the island contribute to the greater volume of precipitation. The frequency of typhoon passage is 0-10% from the average of 20 typhoons passing over the Philippines per year.[6]

Bohol is among the areas in the Philippines threatened by drastic effects of global warming. It is ranked 9th among top 20 provinces vulnerable to a one (1) meter sea level rise.[7] Its seascape as an eco-tourism asset is vulnerable to threats of global warming that may result in sea-level rise, causing loss of tourism and business investments. Cutting of trees in the upland communities is commonly practiced. There is degradation of marine environment due to pollution from industries, agriculture, including animal husbandry, and settlements. Coastal erosion and sedimentation is not properly addressed. Dumping and burning of solid wastes that include toxic materials and chemicals still pose a problem as well as the overflowing of sewers. There is an increase in frequency and intensity of the El Niño and La Niña phenomenon which results to agricultural and ecological problems (e.g. disruption of wildlife) and damage to property.

Changes in rainfall patterns, typhoon frequency and the irregular period of occurrence, sea level rise are now becoming noticeable. The connection between local environmental threats and climate change is an emerging concern among local government units. It is in the context that local government must play a major role in implementing measures on climate change mitigation and adaptation due to their authority to control the necessary changes.

Based on the distribution of rainfall during the year, Bohol's climate as classified by PAG-ASA belongs to Corona's 4th Type, 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/yr in the mountainous areas in the province. Based on the climatogical records of Tagbilaran City weather station, the province has an annual average of 161 rainy days. Average rainfall and trend has 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 centigrade. Prevailing wind direction is towards northeast with an average speed of 2 miles per record. Bohol is not included in the so-called typhoon belt of the country, as typhoons rarely pass in the province. Those passing below or above the island contribute to the greater volume of precipitation. The frequency of typhoon passage is 0-10% from the average of 20 typhoons passing over the Philippines per year.[8]

Based on the data on climate change scenario, the projected seasonal temperature increase, seasonal rainfall change and frequency of extreme events in 2020 and

[6] DENR-BSWM 1991 Preliminary Climatic Classification of 15 selected Provinces in the Philippines

[7] Source: Climate Hotspot, Climate Change Impacts in the Philippines conducted by Greenpeace Southeast Asia, Climate and Energy Campaign, 2007

[8] DENR-BSWM 1991 Preliminary Climatic Classification of 15 selected Provinces in the Philippines

2050 under the medium-range emission scenario in the provinces in Region 7 are presented in Table a, Table b and Table c, respectively. Example for Bohol province the projected values are (for Dec. Jan and Feb.)

The island province of Bohol is predominantly a sedimentary island. It developed from the magmatic, tectonic mechanism that resulted from the under thrusting of the southwest Philippine Plate east of Samar and SurigaoS4. Ongoing erosion, transport and sedimentation continue to accumulate marine and terrestrial deposits in the Bohol basin.

Population growth and economic activities have created pressures on Bohol's environment and natural resources. High demand for physical infrastructure like roads, water systems and power, settlement areas as well as greater demand for goods and services are expected to add pressure on its environment that are looked upon as major necessities for the province's development but often create environmental stress. Such developments in the province need to pro-actively integrate a mechanism to prevent adverse impact on the critical resources and exposure of people and property to danger. Environmentally constrained areas are prone to natural hazards, severe erosion or more specifically, hydrological and geological produced changes.[9]

Risk Profile

Minor and major fault lines are evident on the island as shown by terraced escarpments occurring in its southern and central parts. The terraced escarpments in the Ilihan Formation as well as the graben at the Anda Peninsula are manifestations of these faults. Steep escarpments notably in Loon, Tagbilaran and in Anda Peninsula further prove vertical upliftment caused by tectonics.

Prior to the October 15, 2013 7.2M earthquake in the province, earthquakes have been felt in Bohol but only an average of one perceptible shock is reported each year. Major faults usually trend towards the northeast. Three earthquakes with a magnitude above 4 of the Richter scale (highest was 4.7Ms which occurred in June) were reported in 1998 in the province of Bohol.

There are compelling and urgent reasons why the Province of Bohol should adopt disaster risk reduction and management (DRRM) and climate change adaptation (CCA). It is very obvious from the October 15, 2013 7.2 M earthquakes have jolted

[9] Provincial Development and Physical Framework Plan (PDFPFP), Volume 1, p29

not only the island but also its leaders on the level of disaster risks that the province is faced with. It was dawned on the Boholanos that the province is exposed to disasters and hazards due to its geography and geology.

Environmental risk exists if an area is exposed to certain levels of danger because of its location, surrounding features or proximity to certain objects or activities such as the effects of natural phenomena like hurricanes, earthquakes, volcanoes landslides, flooding and tsunami which expose the lives and properties of people to undue harm with profound effect to ecological systems. Inappropriate development also leads to greater disaster risks.

The poor location of settlements, economic activities and infrastructures, inappropriate use of resources and rapid urban growth exert pressure resulting to further degradation to the environment and spawn more vulnerable communities. In the event of calamities due to natural hazards, vulnerable communities may not be able to cope and hence, will result in a disaster which will eventually lead to risk accumulation and bigger losses when disaster occurs in the area.

Bohol, being an island province, is vulnerable to natural disasters, e.g. drought, storm surges, tsunami, flooding, earthquake, tropical cyclones and landslide. As such, the province has been incurring significant economic and environmental damages from natural and man-made disasters estimated at an average annual direct damage at P14.0 million reaching a total damage of almost P 69 million from 2004-2008 (Table 27-Annex 1 of the PDPFP.

Notable calamities that hit the province include earthquakes, flash floods in Clarin, Tubigon, Loon and Calape; landslides in Balilihan, Loboc, Alicia, Cortes, Jagna, Sierra Bullones; severe rains in Getafe and typhoons “Frank” and “Lando” that left significant damage to Bohol’s agricultural assets. Manmade calamities were also recorded during the period ranging from fire incidents, diarrhoea outbreak and sea mishaps.

From 2006-2008, there were a total of 110 earthquakes, of which only 23% were perceptible and felt by the people in the affected location. Most of the quakes (77%) were not perceptible.
From October 2004 to December 2013, the Bohol Office of Civil Defence reported a total of 72 disaster incidence in the province with a total damage cost of P68.973 million. The geologic and hydro-meteorological disasters that hit Bohol were flash floods, landslide, and earthquake.

Table 1 Summary of Disaster Incidences in the Province of Bohol

Date/ Year	Nature of Event (natural/man-made)	No. of Occur-rences	Location	Cost of Damage (million pesos)
October 2004	Flashflood	1	Jagna	Php 0.100
January to Dec. 2005	Heavy rains, landslide, fire incidents, typhoon, earthquake	7	Jagna, Getafe, Calape, Tagbilaran City	Php 15.048
January to Dec. 2006	Disease outbreak (diarrhea), lightning incidence, landslide, sea mishap, capsized vessel, tidal waves, land cracks, typhoons	18	Loon, Pilar, Tubigon, Ubay, Valencia, Loay, Panglao, Jagna, Candijay, Bien Unido, Getafe, Cortes, Alicia, Sierra Bullones, Batuan	Php 16.450
January to Dec. 2007	Landslide, fire incidents, whirlwind (alimpus), lightning incidents, poisoning, drowning, earthquake, capsized motor blanca, typhoon	18	Tagbilaran City, Jagna, Pres. Garcia, Talibon, Getafe, Trinidad, Pilar, Tubigon, Valencia, Ubay, Loon, Loboc, Loay, Candijay	Php 6.547
January to Dec. 2008	Flashflood, fire incident, landslide, typhoon, capsized vessel/fishing boat, airplane crash	28	Clarin, Tubigon, Tagbilaran City, Cortes, Buenavista, Panglao, Balilihan, Pilar, Talibon, Loon, Lila, Getafe, Dimiao, Loboc, Pres. CPG, Guindulman, Inabanga	Php 30.828
March 2010-October 2013	Earthquake	6	17 hardest municipalities: North and south-western part of Bohol; Maribojoc, Loon, Tubigon, Calape, Clarin Inabanga, Buenavista, Danao, Sagbayan, Catigbian, San Isidro, Antequera, Balilihan and Cortes;	7.8 Billion

Date/ Year	Nature of Event (natural/man-made)	No. of Occur-rences	Location	Cost of Damage (million pesos)
			Southern municipalities of Loboc, Carmen, Lila, Guindulman, Duero, Jagna, G-Hernandez, Valencia, Loay Albuquerque, Baclayon and Tagbilaran City	
October 2014 - December 2014	Tropical Cyclones Queenie, Ruby and Senyang caused flooding events		Eastern and interior parts of Bohol	**Php1,499.468 Billion**
T o t a l		**78**		**Php 7.949 billion**

The Provincial Government of Bohol has created the Provincial Disaster Risk Reduction and Management Council (PDRRMC) to prepare, promote and coordinate measures to protect human lives and property during these unforeseen events. Coordination among offices headed by the Governor is very vital on the event of disasters with support from 62 government offices and private establishments. Communication and warning mechanisms are already in-place through PAG-ASA, Philippine National Police, Bohol Law Enforcement Communication System (BLECS), radio stations, information and warnings that reach people in real time. The evacuation system is arranged with the Department of Education and other government offices where schools and other public buildings are utilized as evacuation centers. Table 28-Annex 1 of the PDPFP presents the existing facilities and services in the province thru its Provincial, City and Municipal Disaster Coordinating Councils.

Disaster Risk and Vulnerability Assessment Report[10]

In terms of hydro-meteorological hazards, Bohol is susceptible to flooding, rain-induced landslides, storm surges and big waves which are also brought about by climate change impacts.

[10]This report is taken from the Office of Civil Defense (OCD)-Bohol and the rest come from the Mines and Geosciences Bureau – Region 7

Table 2 Trends in Climate Change Impacts in Bohol

Climate Change Impacts	Areas or location affected (Municipalities/Barangays)	Trend	Intensity	Frequency of Occurrence
Sea level rise	30 coastal towns including Tagbilaran City	same areas	every year	increasing every year
Prolonged drought	47 towns and 1-city	expanding to coastal areas	every year	every year
El Nino events	47 towns and 1-city	expanding to coastal areas	every year	every year
Floods	336 out of 1,109 brgys (47 towns and 1-city)	expanding to other areas	Increasing	Increasing every year (flash flooding, seasonal, river overflow, coastal flooding due to heavy rains, dam overflow
Storm surge	30 coastal towns and 1-city	same areas	Increasing	Increasing every year
Monsoon rains a) Southwest Monsoon or “Habagat” in the local dialect; b) Northeastern Monsoon or “Amihan” in the local	47 towns and 1-city	expanding to interior part of the province	Increasing even dry season	Increasing every year

Climate Change Impacts	Areas or location affected (Municipalities/Barangays)	Trend	Intensity	Frequency of Occurrence
dialect				

The risk and vulnerability assessment report estimates that there are 112 barangays in Bohol which are susceptible to flowing. As far as rain-induced landslides are concerned, there are about 298 barangays in Bohol which are highly susceptibility to rain-induced landslides, while 586 barangays have medium susceptibility and 812 barangay with low susceptibility. In terms of storm surges or big waves, a total of 316 barangays in Bohol are susceptible. Table 3 below shows past occurrences of storm surges and big waves in Bohol.

Table 3 Matrix for Past Storm Surges/Big Waves Events in Bohol

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
Nov. 27, 2014 TS Queenie; Dec. 6, 2014 TS Ruby and Dec. 29, 2014 TS Seniang	Provincewide	Total Damage: 1,499,468.00 Easter and interior towns of Bohol
June 25, 2008 Typhoon “Frank”	Talibon, Loon, Lila, Getafe, Dimiao, Guindulman	Total Damages – P3.2M Talibon – P1M Loon – P1.5M Lila – P0.1M Getafe – P0.3M Dimiao – P0.2M Guindulman – P0.1M
May 12, 2008 Low Pressure Area	Province wide	No data
May 8, 2008 TD “Butchoy”	Province wide	No data
April 14, 2008 TD “Ambo”	Province wide	No data
Nov. 11-12, 2007 TS “Lando”	Pres. Carlos P. Garcia Bien Unido Zamora, Talibon Buenavista Getafe Trinidad	Total Damages – P1.387M Pres. Garcia – P0.472M Bien Unido/Getafe – No data Zamora, Talibon –

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
Nov. 27, 2014 TS Queenie; Dec. 6, 2014 TS Ruby and Dec. 29, 2014 TS Seniang	Provincewide	Total Damage: 1,499,468.00 Easter and interior towns of Bohol
		P0.76M Buenavista – No data Trinidad – P0.055M
November 19, 2007 Whirlwind "Alimpus"	Pres. Carlos P. Garcia	Damaged houses – P1M
June 16, 2007 Whirlwind "Alimpus"	Loon	No data

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

Bohol is prone to geologic hazards like ground shaking, liquefaction, earthquake-induced land slide 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.

Table 4 Matrix for Past Earthquake Events in Bohol

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
October 15, 2013	17 hardest municipalities: North and south-western part of Bohol; Maribojoc, Loon, Tubigon, Calape, Clarin Inabanga, Buenavista, Danao, Sagbayan, Catigbian, San Isidro, Antequera, Balilihan and Cortes; Southern municipalities of Loboc, Carmen, Lila, Valencia, Loay Albuquerque, Baclayon and Tagbilaran City	Intensity 7.2 211 dead persons 877 injured and 8 missing persons Php 7.4 Billion damaged to major infrastructures, houses, government buildings, tourism facilities, properties and other businesses
July 18, 2011 Earthquake	09.64°N, 124.58°E - 17 km S 36° E of Guindulman (Bohol) 03:10 PM	Intensity II No damage
	09.61°N, 124.53°E - 17 km S 15° E	No damage

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
	of Guindulman (Bohol) 05:02 PM	
June 11, 2011 Earthquake Magnitude 3.3 hits in the Province of Bohol	Loboc, Bohol Tagbilaran City Cortes, Bohol	Intensity III Intensity II No Damage
August 28, 2010 Earthquake	Brgy. Tabahan, Brgy. Bulawan, Guindulman, Bohol	No damage
June 21, 2010 Earthquake	Dauis, Bohol	No damage
May 7, 2010 Earthquake	Jagna Garcia-Hernandez Duero Tagbilaran City	Intensity - III Intensity – III Intensity – II No Damage
March 26, 2010 Earthquake	Tagbilaran, Dauis, Corella	No data
January 8, 2009 Earthquake	Anda, Bohol	No damage

In terms of earthquake susceptibility, the same risk and vulnerability assessment report states that there are 381 barangays in Bohol which are susceptible to intensity 7 earthquakes and about 887 barangays which are susceptible to Intensity 8 earthquakes.

Landslides often accompany the occurrence of earthquakes. The risk and vulnerability assessment report estimates that there are about 215 barangays which are highly susceptible to earthquake-induced landslides; while 733 barangays have medium susceptibility and 887 barangay have low susceptibility.

The detailed data tables and matrices of the risk and vulnerability assessment report of Bohol Province can be found in **Annex B**.

Prior to the October 15, 2013 7.2M earthquake, Bohol Province has a complete repository of hazard maps to include soil erosion map, storm surge hazard map, tsunami hazard map, rain-induced landslide hazard maps, liquefaction maps, ground rupture, earthquake-induced landslide hazard map and the ground-shaking map. These Hazard Maps were acquired from the Hazards Mapping and Assessment for Effective Community-Based Disaster Risk Management **(READY) Project** through the Philippine Institute of Volcanology and Seismology (PhIVolcS). The PDPFP, Volume one, from 30 – 33 shows a number of hazards maps. These maps can be viewed and downloaded at **http://www.ppdobohol.lgu.ph/maps/hazard-maps/**

It is obvious that these hazard maps need updating and revising, especially after the October 15, 2013 “Great Bohol Earthquake.” Figure 1 below, which is the ground-shaking map, shows the opposite of what happened during the October 15, 2013 7.2M earthquake where the lighter-shaded area in the ground shaking hazard map were the areas badly hid by the 7.2Ms earthquake. At present the PhIVolcS is currently updating these maps.

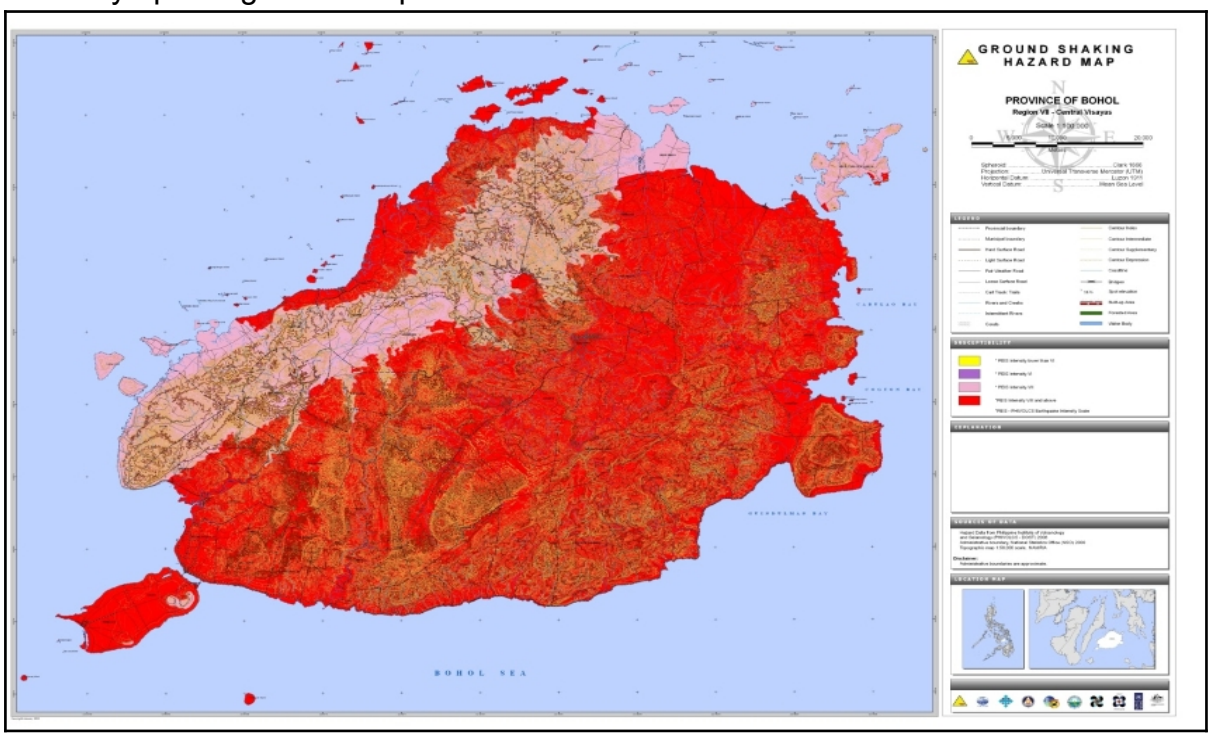


Figure 1 Ground-Sharing Hazard Map[11]

Assessment of Natural and Man-Made Hazards

Hazards that have occurred in Bohol Province over the years: (a) natural, such as earthquake, typhoons/storms, flooding, landsides, storm surges, tsunami, sink holes, subsidence, tornado, drought or El Niño phenomenon, and lighting; and (b) man-made hazards food poisoning, wars or armed conflicts, red tide, fires (land or sea-based) oil-spill, and collision / vehicular accidents and just recently, armed conflict with the Abu Sayyaf elements.

These natural and man-made hazards were rated by workshop participants in terms of risks (likelihood of occurrence) and vulnerability (susceptibility and capacity of the community and populace to be adversely affected by the disaster caused by the hazard).

[11] These Hazard Maps were acquired from the Hazards Mapping and Assessment for Effective Community-Based Disaster Risk Management **(READY) Project** through the Philippine Institute of Volcanology and Seismology (PhIVolcS).

Participants used a color-coded scale from 1 – 4, where one means low and 4 means extremely high. Below is a table that results from the participants' analysis of disaster risks and the vulnerability assessments. The following table below shows the results of the risk analysis and vulnerability assessments made by workshop participants.

describes

Table 5 Risk Analysis (R) and Vulnerability Assessment (V) of Hazards in Bohol

HAZARDS	Low (1)		Medium (2)		High (3)		Extremely High (4)	
	R	V	R	V	R	V	R	V
Natural								
Earthquake								
Typhoon/ Storm								
Flooding/ La Nina								
Landslide								
Storm Surge								
Tsunami								
Sink Holes								
Subsidence								
Tornado								
Drought / El Niño								
Lightning								
Man-Made								
Food Poisoning								
Wars /Armed Conflict								
Red Tide								
Fire (Sea & Land Base)								
Oil Spill								
Collision /Vehicular Accidents								
Armed Conflict								
Low (1)	Medium (2)		High (3)		Extremely High (4)			

Source: DRRM Planning Workshop Participants' Risk Analysis and Vulnerability Assessment, May 2014

From the above-table it can be seen that Bohol is very high risk and vulnerability to a number of natural hazards. The PDRRMC participants see earthquakes, typhoon /

storms, flooding and the La Niña phenomenon, landslides and drought or the El Niño phenomenon have greater risks and likelihood to occur and people and communities are extremely vulnerable and likely to greatly suffer from the effects and magnitude of disasters these hazards can cause. The implications point to the urgent need to put in place short and long terms plans to prevent the disasters, mitigate their effects, put in place preparedness and response measures as well as post-disaster rehabilitation and recovery actions.

The State of the DRRM of the PLGU

The foremost goal of Republic Act No. 10121 (M 10121), otherwise known as the *Philippine Disaster Risk Reduction and Management (PDRRM) Act of 2010* is to strengthen the country's National DRRM System towards sustainable economic development, by mainstreaming the same in all national and local development processes.

Mainstreaming of DRRM in all these processes principally requires the institutionalization and organization of its structures, in all levels of government nationwide, where local DRRM plans and policies will be developed, and where implementation of actions and measures pertaining to all aspects of DRRM will be initiated.

It is therefore important to assess the state of disaster risk reduction management of local government units. During the May 12 – 14, 2014 LDRRM Planning Workshop, the PDRRMC participants assessed the state of the PLGU's DRRM in terms of strengths and weaknesses, which were further delineated into risks and vulnerabilities.

A. **Strengths of the PLGU in PDRRM** The following are the strengths that the PDRRMC:

- There is some level of available information and data on multi-hazards occurring in the province, as evidenced by

  - ✓ Faults are already identified
  - ✓ Hazard maps available
  - ✓ The actual experience of the 7.2M earthquake in October 15, 2013
  - ✓ Partial assessment of quake-related hazards like sink-holes using ground-penetrating radar (GPR) conducted by MGB
  - ✓ Presence of hazard profile and disaster risk assessment (DRA) Report for Bohol
  - ✓ Active provincial epidemiology surveillance unit (PESU)

- Trainings and awareness-raising activities conducted, such as

  - ✓ Constant DRRM training
  - ✓ High level of awareness on DRRM
  - ✓ Continuous awareness campaign on disaster consciousness
  - ✓ Presence of Visayan/Boholano version of DRR-CCA Training modules

- Presence of quick response actions, tools and equipment as well as early warning devices to include

  - ✓ Tarsier 117
  - ✓ Early warning system advisories
  - ✓ Operational and functional Search and rescue teams
  - ✓ Available HURST tools/ Jaws of Life equipment

- Established organizational structures for DRRM and cooperation networks as can be seen by

  - ✓ Proactive and operational PDRRMC
  - ✓ Strong tie-up/linkages with NGAs, NGOs, I-NGOS
  - ✓ Presence of security forces in strategic areas of the province
  - ✓ Bohol is insurgent-free
  - ✓ PDRRMS's strong communication links with PAG ASA and MLGUs
  - ✓ Active stakeholder participation
  - ✓ Presence of PDRRMC inter-cluster coordination

- Presence of disaster management - related plans such as

  - ✓ El Nino contingency plan
  - ✓ Presence of draft earthquake contingency plan
  - ✓ Presence of post Great Bohol Earthquake Relief, Recovery and Rehabilitation Plan

B. Weaknesses of the PLGU in PDRRM:

<u>Vulnerability Factors</u>

- ✓ Un-institutionalized DRRM office
- ✓ Majority of MLGUs belong to 4th and 5th class municipalities; lack resources/funds
- ✓ Not all MLGUs/areas with internet access; thus difficult to communicate

- ✓ Poor capacities of district hospitals to respond to emergencies of bigger magnitudes such as during the 7.2M earthquake
- ✓ There is more need for equipment and tools for disaster preparedness
- ✓ PDRRMO not fully operational to provide information and increase awareness on DRR-CCA down to the “Purok” level
- ✓ PDRRM Plan needs revisiting / updating as this previous document was prepared only for compliance purposes and not well grounded on risk analysis and vulnerability assessments
- ✓ Zoning ordinance not strictly followed/implemented thus local communities are building on hazard prone areas like coastlines and mountain slopes
- ✓ Lack of flood control facilities
- ✓ LGUs not so conscious on the impact of tsunamis and storm surges
- ✓ Evacuation centers are not yet established
- ✓ Data capture and reporting template on extent of damage inadequate and not standardized
- ✓ No wastewater treatment facilities/disposal endangering water quality
- ✓ Households are without sanitary latrines threatening water and food safety
- ✓ Lack of fire-fighting facilities
- ✓ Lack of discipline among drivers, especially motorcycles, causing more vehicular accidents and unnecessary deaths

Risk Factors

- ✓ High risk areas/ flooding area nor properly identified
- ✓ Presence of sink holes
- ✓ Dams dependent on rainfall
- ✓ Typhoon prone
- ✓ Rice fields mostly rain-fed
- ✓ High percentage of contaminated water sources

Gaps in PLGU DRRM Capacity

Capacity gaps of the provincial government as far as disaster risk reduction and management is concerned. Identified gaps are summarized as follows:

- Different sources of data; no /lack centralized database system
- Data inadequacy related to DRRM
- Inadequacy of early warning system
- Not all LDRRMOs are appointed, some are only designates
- Identification of relocation sites

- No planned evacuation areas with affected families converging in any open field with less LGU assistance
- Delayed construction due to unavailable MGB clearance
- Not enough supply of agricultural products
- No clear responsibility in relief distribution/procedure
- Communities were not informed or made aware where to get relief assistance
- Timing, info dissemination and directions for determining route alternatives, especially to facilitate delivery of relief goods
- Bohol is dependent on outside power supply
- Lack of skilled manpower and equipment
- Limited supply of medicines to cater to the large scale disasters
- Delay in the replenishment of medical supplies from Tagbilaran to affected hospitals
- Limited services provided to the constituents due to extent of damage
- Limited DepEd Funds for emergency response, evacuation centers and re-building of school facilities and classroom damaged by earthquakes and other hazards
- Lack of trained search and rescue (SAR) personnel and equipment

PLGU DRRM Vision and Mission Statements

Vision

A disaster-resilient, climate change adaptive and safe Boholano community with a strong spirit of stakeholder commitment guided by effective local governance ensuring social protection, economic security and socially-inclusive disaster management towards sustainable development

Mission

To continuously build the resiliency and adaptive capacity of Bohol to reduce potential risks and manage the impacts of hazards ensuring safety of people and communities who will be assisted for rehabilitation and reconstruction back to normal lives

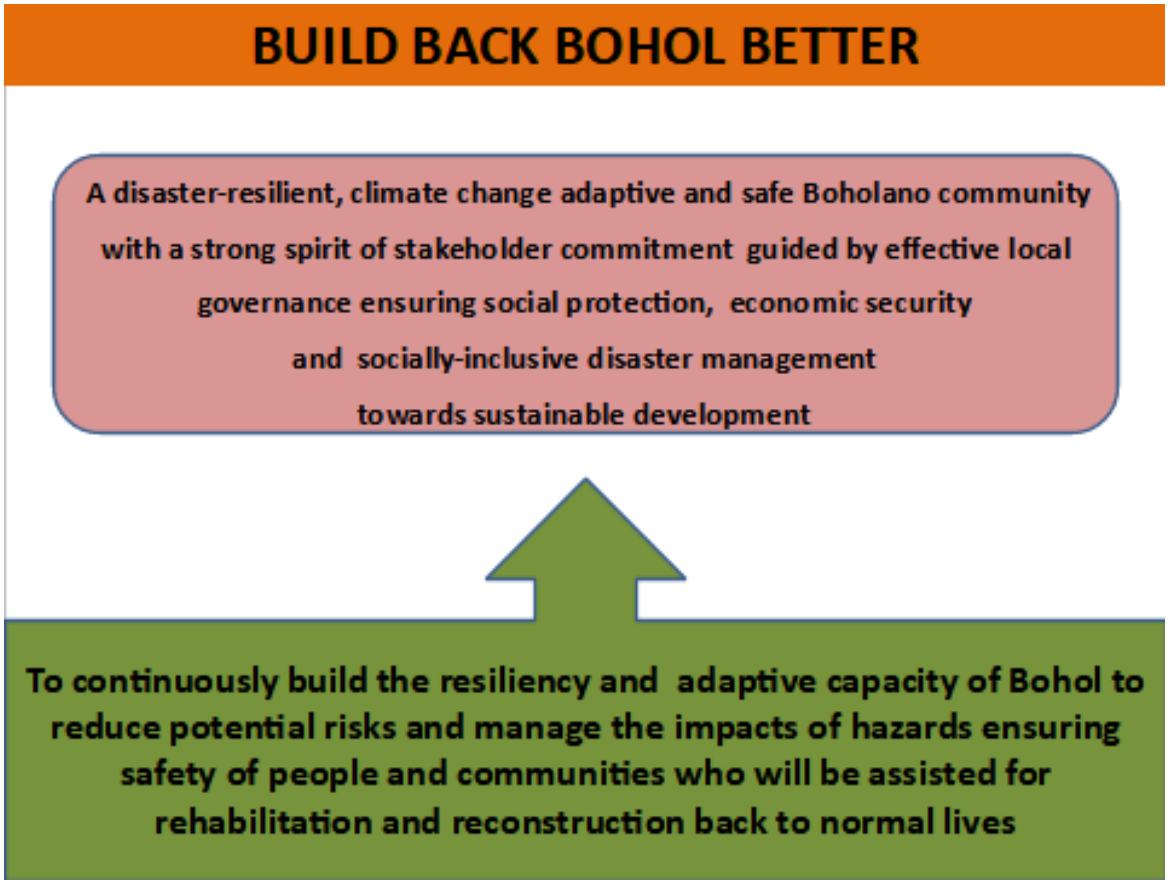


Figure 2 Bohol Disaster Risk Reduction Management Framework

PLGU LDRRMC and LDRRMO Organization Structures

With this Vision and Mission, the Provincial Government of Bohol thru Gov. Arthur C. Yap has issued Executive Order No. 10 series of 2019 on the Reconstitution and Strengthening of the Provincial Disaster Risk Reduction and Management Council (PDRRMC) of the Province of Bohol to ensure the coherent, integrated, proficient and responsible emergency management system in the province and coordinate and implement projects and activities on civil protection, standard humanitarian assistance and disaster management.

The PDRRMC's composition is as follows:

Gov. Arthur C. Yap	-	Chairperson
Vice Gov. Rene L. Relampagos	-	Executive Vice Chairperson
Ms. Vina Antopina DOST	-	Vice Chairperson on Disaster Prevention and Mitigation
Dir. Johnjoan A. Mende DILG	-	Vice Chairperson on Disaster Preparedness

Ms. Carmelita M. Tecson - Vice Chairperson on Disaster Response
OPSWD

Atty. John Titus J. Vistal - Vice Chairperson on Disaster Rehabilitation and Recovery
PPDO

Further, the Heads or Designated Representatives of the following offices and organizations shall compose the different DRRM Pillars:

Disaster Prevention and Mitigation	Disaster Preparedness	Disaster Response	Disaster Rehabilitation and Recovery
PDRRMO GO DOST OCD PPDO PHIVOLCS PAGASA SP DEPED BFP BOHOL TRIMEDIA DENR BISU OPV OPA PCG BEMO DPWH BALDRRMO BANGON Phil Mine Safety and Environment Association - Bohol Phil Institute of Civil Engineers United Architects of the Phils-Bohol Sangguniang Panlalawigan Committees on Social Services; Peace & Order and Public Safety; Environment and Natural Resources	PDRRMO GO OPV OPA DILG OCD PHIVOLCS PAGASA DEPED AFP PNP BFP BOHOL TRI-MEDIA LIGA NG MGA BARANGAY BANGON PRC PCG BALDRRMO MDRRMC BDRRMC TaRSIER 117 TELCOS Phil Institute of Civil Engineers (PICE) United Architects of the Phils-Bohol (UAP) League of Municipalities of the Phils – Bohol Chapter	PDRRMO GO TaRSIER 117 OPSWD PHO/Hospitals OPV OPA PEO PGSO PMO DPWH 1, 2, 3 OCD DSWD NATIONAL DOH NFA PNP AFP BFP BOHOL TRI-MEDIA PRC DEPED PCG BANGON BALDRRMO PHIL MARITIME UN-OCHA BOHOL CONTRACTORS ASSN BCCI IMAP-Bohol MDRRMC BAHRR Bohol Medical Society Bohol Nurses Association Local Power/Water/Communications Utilities (Generation, Transmission (NGCP), Distribution e.g. BLCI, BOHECO, BWUI etc) Local & International Humanitarian Aid partners (UNDP, UNICEF, MERLIN, IOM, ETC) Local & Intl NGOs in Bohol Bohol Goodwill Volunteers, Inc. JCI Chocolate Hills JCI Boholana Kisses Phil Mine Safety and Environment Association – Bohol Phil Institute of Civil Engineers United Architects of the Phils-Bohol TELCOS – Globe, Smart, Sun Bus Operators & Drivers Assn Bohol Bankers Association Tzu Chi Foundation World Vision	PDRRMO GO PPDO DOH PHO/Hospitals OPA OPV PGSO PMO PEO AFP Bohol Bankers Assn DPWH 1, 2, 3 DA-7 BOHOL TRI-MEDIA DSWD NATIONAL PCG BANGON BOHOL CONTRACTORS ASSN BALDRRMO MDRRMC BCCI TELCOS International Humanitarian Aid Partners (UNDP, UNICEF, MERLIN, IOM, etc) Local and International NGOs in Bohol Phil Mine Safety and Environment Association – Bohol Phil Institute of Civil Engineers United Architects of the Phils-Bohol

Moreover, a Local Disaster Risk Reduction and Management Office was created by virtue of Provincial Ordinance NO. 2016-010 to serve as Secretariat and assist the LDRRMC in the implementation of disaster management plans.

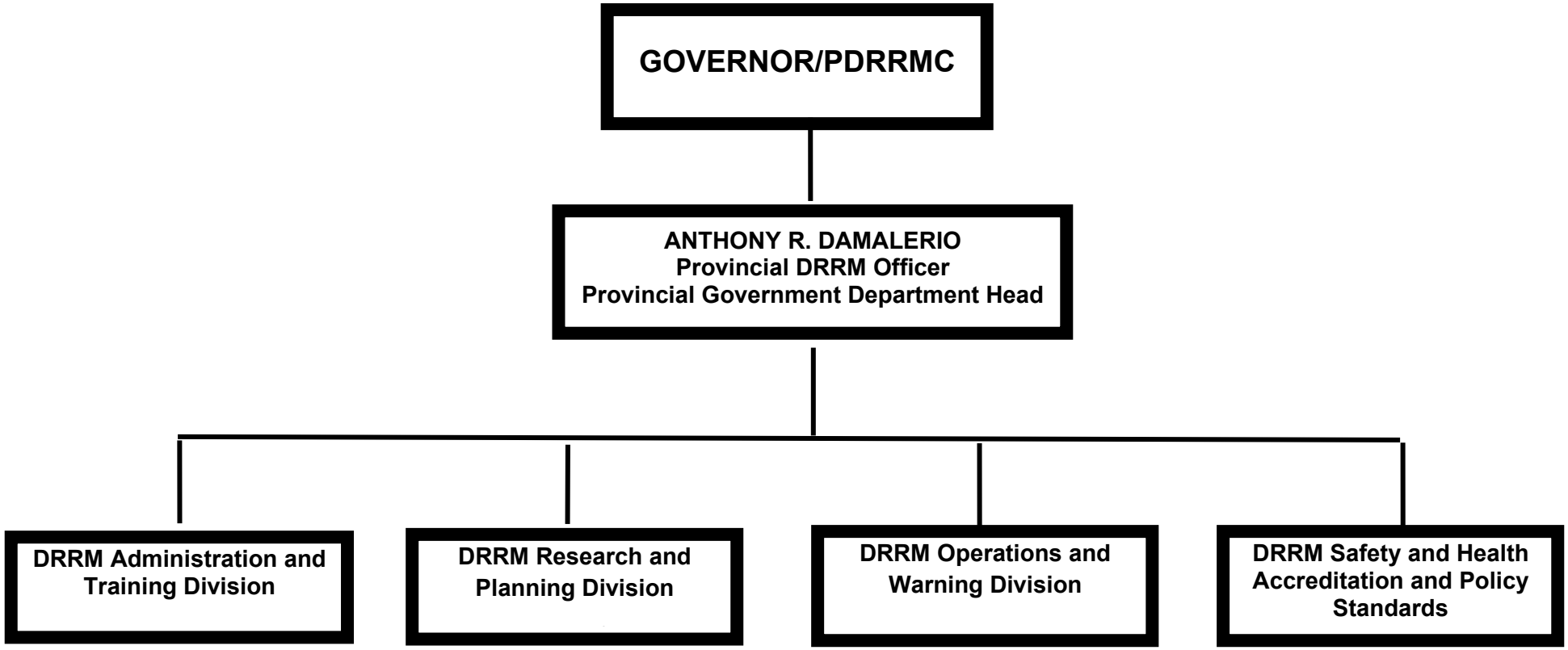


Figure 3: LDRRMO Organizational Structure

FUNCTIONS AND RESPONSIBILITIES OF THE PROVINCIAL DRRM OFFICE

1.1. General Functions of the Office

The PDRRMO within its territorial jurisdiction, shall be responsible for setting the direction, development, implementation, and coordination of disaster risk reduction and management programs, and shall perform the following functions and those that may be authorized by the PDRRMC.

1.2 Functions of the Administration and Training Division

- Organize and conduct training, orientation, and knowledge management activities on DRRM at the local level;
- Identify, assess and manage the hazards, vulnerabilities and risks provincewide that involve the most vulnerable sectors (women, children, senior citizens, and PWD);
- Identify and implement *cost-effective* risk reduction measures and strategies;
- Disseminate information and raise public awareness about those hazards, vulnerabilities, and risks;
- Take all necessary steps on a continuing basis to maintain, provide, or arrange the provision of, or to otherwise make available, suitably-trained and competent personnel for effective civil defense and DRRM in its area;
- Organize, train, equip and supervise the local emergency response teams and the accredited community disaster volunteers (ACDVs), ensuring that humanitarian aid workers are equipped with basic skills to assist mothers to breastfeed;
- Implement policies, approve plans and programs of the LDRRMC consistent with the policies and guidelines laid down in RA 10121
- Promote and raise public awareness of, and compliance with RA 10121 and legislative provisions relevant to the purpose of the latter;
- Implement policies, approve plans and programs of the LDRRMC consistent with the policies and guidelines laid down in RA 10121.
- Train the most vulnerable sectors (women, children, senior citizens, and PWD) in DRRM, especially in disaster preparedness.
- Does other administrative-related functions.

1.3 Functions of the Research and Planning Division

- Design program and coordinate DRRM activities, consistent with the NDRRMC's standards and guidelines;
- Facilitate and support risk assessments and contingency planning activities at the local level;
- Consolidate local disaster risk information which includes natural hazards, vulnerabilities, and climate change risks, and maintain a local risk map;
- Conduct research and development initiatives on DRRM;
- Formulate and implement a comprehensive and interated Local DRRM Plan (LDRRMP) in accordance with the national,regional, and provincial framework, and policies on DRR in close coordination with the Local Development Counil (LDC);
- Prepare and submit to the Local Sanggunian through the Local DRRM Council and the LDC the annual LDRRMO Plan and budget, the proposed programming

of the LDRRMF, other dedicated DRRM resources, and other regular funding source/s and budgetary support of the LDRRMO or BDRRMC;

- Maintain a database of human resource and their capacities, equipment, directories, and location of critical infrastructures such as hospitals and evacuation centers; and
- Conduct research and development initiatives on DRRM-CCA in coordiination with other agencies;
- Serve as the Secretariat and executive arm of the Local DRRM Council (LDRRMC);
- Recommend through the LDRRMC the enactment of Local Ordinances consistent with RA 10121;
- Prepare and submmit, through the LDRRMC and the LDC, the report on the utilization of he LDRRMF and other dedicated DRRM resources to the local COA, copy furnished the Regional Director of the Office of the Civil Defense (OCD) and the local government oper8ations officer of the DILG; and
- Involve the most vulnerable sectors (women,children, senior citizens, and persons with disability (PWD) in risk assessment and planning.

1.4 Functions of the Operations and Warning Division

- Operate a multi-hazard early warning system, linked to DRR to provide accurate and timely advice to national or local emergency response organizations and to the general public, through diverse mass media, particularly radio, landline communications, and technologies for communication within rural communities;
- Conduct continuous disaster monitoring and mobilize instrumentalities and entities of the LGUs, C50s, private groups and organized volunteers, to utilize their facilities and resources for the protection and preservation of life and properties during emergencies in accordance with existing policies and procedures;
- Develop, strengthen, and operationalize mechanisms for partnership or networking with the private sector, C50s, and volunteer groups;
- Respond to and manage the adverse *effects* of emergencies and carry out recovery activities in the affected area, ensuring that there is an efficient mechanism for immediate delivery of food, shelter and medical supplies for women and children, endeavor to create a special place where internally-displaced mothers can find help with breastfeeding, feed and care for their babies and give support to each other;
- Respond to and manage the adverse *effects* of emergency and carry out recovery activities to the most vulnerable areas especially to the vulnerable sectors (women, children, senior citizens, and Persons With Disability (PWD);
- Establish linkage and/or network with other LGUs for DRR and emergency response purposes;
- Establish a provincial, city or municipal, and barangay DRRM Operations Center;
- Coordinate other DRRM activities;
- Give early warning to the most vulnerable sectors (women, children, senior citizens, and PWD) to respond to their needs.

In summary, the PDRRMC participants during the Local Disaster Risk Reduction Management Planning workshop saw that the key recommendations to attain a vision of building back Bohol better include the following key and basic DRRM reforms:

1. Good, accessible and accurate database system from data capture, to data processing and data storage and retrieval;
2. A legislated, well-supported and financed Provincial Disaster Risk Reduction Management Plan at all level that is monitored and assessed periodically;
3. A functional, financially supported, legislated and well-resourced / staffed Provincial Disaster Risk Reduction Management Office at all levels;
4. Pervasive disaster consciousness, awareness, prevention, preparedness and response institutionalized at the community level and supported by the civil society and private / business sector; and
5. A DRRM Governance Training Center that continually builds capacities of local governments and communities to plan, prevent, mitigate, prepare and effectively respond to disasters and undertake post disaster rehabilitation and recovery actions.

3.0 Provincial Disaster Risk Reduction Management (DRRM) Plan

The Provincial Disaster Risk Reduction Management (DRRM) Plan is closely aligned with the National NDRRM Plan. In this regard, the PDRRM Plan just like the NDRRM Plan serves as a road map on how disaster risk reduction and management will contribute to the attainment of sustainable development, build the adaptive capacities of communities, increase the resilience of vulnerable sectors and optimize disaster mitigation opportunities with the end in view of promoting people's welfare and security towards gender-responsive and rights-based sustainable development.[12]

Provincial DRRM Plan Components

There are four (4) thematic areas or components of the Provincial Disaster Risk Reduction Management Plan. Each thematic area or component is briefly below[13] as follows

[12] National Disaster Risk Reduction Management Plan (NDRRMP).
[13] National Disaster Risk Reduction Management Plan, p7

1. ***Disaster Prevention and Mitigation*** This component provides key strategic actions that give importance to activities revolving around hazards evaluation and mitigation, vulnerability analyses, identification of hazard-prone areas and mainstreaming DRRM into development plans. It is based on sound and scientific analysis of the different underlying factors which contribute to the vulnerability of the people and eventually, their risks and exposure to hazards and disasters.

2. ***Disaster Preparedness*** This component pertains to the key strategic actions that give importance to activities revolving around community awareness and understanding; contingency planning; conduct of local drills and the development of a national disaster response plan. Risk-related information coming from the prevention and mitigation aspect is necessary in order for the preparedness activities to be responsive to the needs of the people and situation on the ground. Also, the policies, budget and institutional mechanisms established under the prevention and mitigation priority area will be further enhanced through capacity building activities, development of coordination mechanisms. Through these, coordination, complementation and interoperability of work in DRRM operations and essential services will be ensured. Behavioral change created by the preparedness aspect is eventually measured by how well people responded to the disasters. At the frontlines of preparedness are the local government units, local chief executives and communities.

3. ***Disaster Response*** This component gives importance to activities during the actual disaster response operations from needs assessment to search and rescue to relief operations to early recovery activities are emphasized. The success and realization of this priority area rely heavily on the completion of the activities under both the prevention and mitigation and preparedness aspects, including among others the coordination and communication mechanisms to be developed. On-the-ground partnerships and the vertical and horizontal coordination work between and among key stakeholders will contribute to successful disaster response operations and its smooth transition towards early and long term recovery work.

4. ***Disaster Rehabilitation and Recovery*** This component covers areas like employment and livelihoods, infrastructure and lifeline facilities, housing and resettlement, among others. These are recovery efforts done when people are already outside of the evacuation centers.

These priority areas are not autonomous from the other nor do they have clear start and end points. The 4 priority areas are NOT seen as a mere cycle which starts in

prevention and mitigation and ends in rehabilitation and recovery. The best way to describe the four thematic areas is that they -

a) Mutually reinforce each other and are interoperable.
b) DO NOT, SHOULD NOT and CANNOT stand alone.
c) Have no clear starting nor ending points between each of the aspects and overlaps are to be expected.
d) Are problem-needs and asset-strengths centered.
e) All point to one direction - reduce people's vulnerabilities and increasing their capacities.

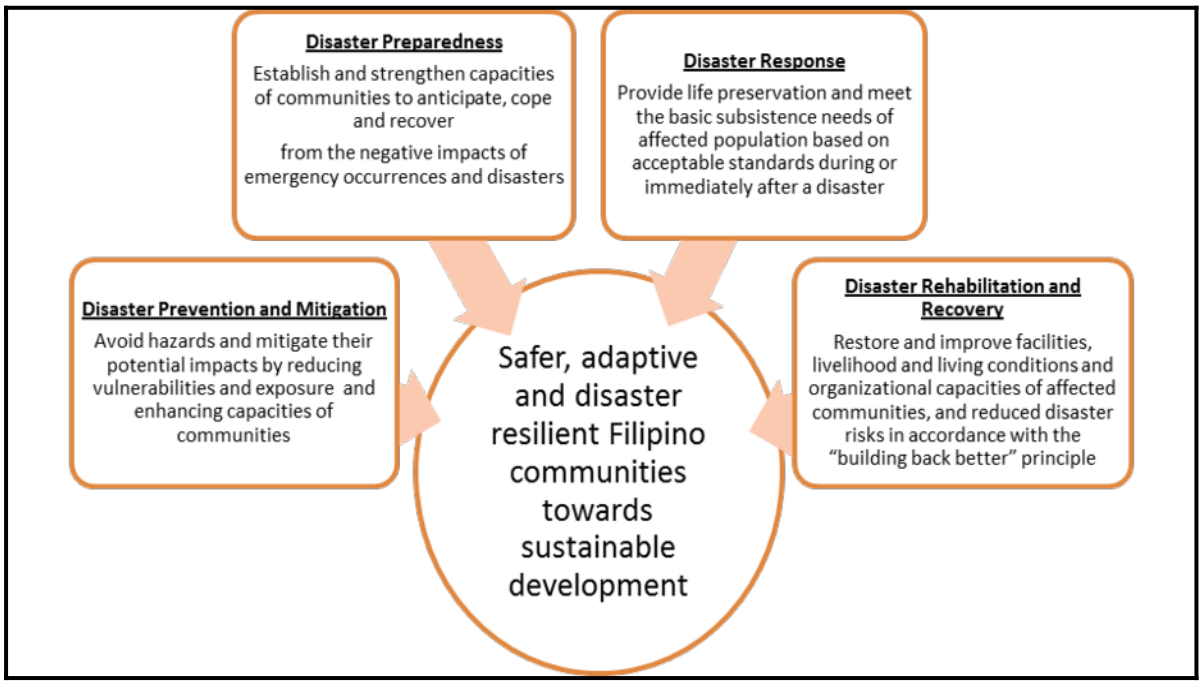


Figure 3 Four Mutually-Reinforcing Thematic Areas of the PDRRRM Plan

Provincial DRRM Goals, Objectives, Outcomes and Outputs

The succeeding tables present the Provincial DRRM objectives, outcomes and outputs. Prior to the presentation of the provincial objectives, outcomes and outputs, the national goals and objectives contained in the National Disaster Risk Reduction Management Plan (NDRRMP) are stated to show that the provincial objectives, outcomes and outputs are aligned with the goals and objectives of the National Risk Reduction Management Plan (NDRRMP).

These outputs results from the LDRRM Workshop held Mary 12- 14, 2014 where participants were grouped into four and worked on each DRRM pillar to include disaster prevention and mitigation, disaster preparedness, disaster response and disaster rehabilitation and recovery.

Table 6 Objectives, Outcomes and Outputs for Disaster Prevention and Mitigation

PILLAR:	**PREVENTION AND MITIGATION**	
GOAL	**Avoid hazards and mitigate their potential impacts by reducing vulnerabilities and exposure and enhancing capacities of communities**	
National Objectives	Reduce vulnerability and exposure of communities to all hazards	Enhance capacities of communities to reduce their own risks and cope with the impacts of all hazards
Provincial Objectives	• Ensure strict implementation of existing laws & ordinance & other related issuances • Reduce vulnerability & exposure of communities to all hazards • Enhance capacities of communities / DRRM councils to reduce their own risks & cope with the impacts of all hazards. • Increase disaster consciousness and responsibilities of communities. • Establish and institutionalize PDRRM- CCA governance center/ office	
Provincial Outcomes	• DRRM compliant and climate change adaptive LGUs and communities • Disaster-resilient roads and infrastructures • Reduced risks and vulnerabilities of people and communities to all hazards • Increased capacities of local communities to reduce and manage risks • Response-ready and capacitated LGUs and DRRM Councils • Green and adaptive agricultural and industrial technologies	
Provincial Outputs	• Compliance reports and findings • Approved local ordinance for quality assurance and quality control in building and construction of infrastructures • Draft ordinance for earthquake Trust Fund • Installation of early warning devices and forecasting systems • Risk Analysis and Vulnerability Assessment Reports as basis for production of hazard maps at all levels • Disaster Response Manual • Implemented and Monitored DRRM Plans and functional Office / Committees at all LGU, including *Purok* level • Evacuation centers and relocation sites well-identified and established	

	• DRRM / CCA Database established and functional • Scaling up use of solar panels, rain water collectors, climate-change resistant seeds, etc.

Table 7 Objectives, Outcomes and Outputs for Disaster Preparedness

PILLAR:	**PREPAREDNESS**				
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrences and disasters**				
National Objectives	Increase the level of awareness of the community to the threats and impacts of all hazards, risks and vulnerabilities	Equip the community with the necessary skills to cope with the negative impacts of a disaster	Increase the capacity of institutions	Develop and implement comprehensive national and local disaster preparedness policies, plans and systems	Strengthen partnership among all key players and stakeholders
Provincial Objectives	• Ensure strict implementation of existing laws & ordinance & other related issuances • Reduce vulnerability & exposure of communities to all hazards • Enhance capacities of communities / DRRM councils to reduce their own risks & cope with the impacts of all hazards. • Increase disaster consciousness and responsibilities of communities. • Establish and institutionalize PDRRM- CCA governance center/ office				
Provincial Outcomes	• DRRM compliant and climate change adaptive LGUs and communities • Disaster-resilient roads and infrastructures • Reduced risks and vulnerabilities of people and communities to all hazards • Increased capacities of local communities to reduce and manage risks • Response-ready and capacitated LGUs and DRRM Councils • Green and adaptive agricultural and industrial technologies				
Provincial Outputs	• Compliance reports and findings • Approved local ordinance for quality assurance and quality control in building and construction of infrastructures				

	• Draft ordinance for earthquake Trust Fund • Installation of early warning devices and forecasting systems • Risk Analysis and Vulnerability Assessment Reports as basis for production of hazard maps at all levels • Disaster Response Manual • Implemented and Monitored DRRM Plans and functional Office / Committees at all LGU, including *Purok* level • Evacuation centers and relocation sites well-identified and established • DRRM / CCA Database established and functional • Scaling up use of solar panels, rain water collectors, climate-change resistant seeds, etc.

Table 8 Objectives, Outcomes and Outputs for Disaster Response

PILLAR:	**RESPONSE**		
GOAL	**Provide life preservation and meet the basic subsistence needs of affected population based on acceptable standards during or immediately after a disaster**		
National Objectives	To decrease the number of preventable deaths and injuries	To provide basic subsistence needs of affected population	To immediately restore basic social services
Provincial Objectives	• Deploy SAR teams and security forces to the scene with 8 hours. To conduct rapid damage and needs assessment (DANA) by the LDRRMC. • Conduct immediate relief operation w/in 24 hours (food & non-food items & deployment of WATSAN team. • Provide immediate medical services to disaster victims including psychological first aid • Conduct pre- emptive/ timely evacuation of vulnerable families/ families at risk.		
Provincial Outcomes	• Zero preventable deaths • Low disabilities secondary to injuries • Crimes prevented • Timely and appropriate responses are provided and immediate relief for the affected families.		
Provincial Outputs	• Rescue teams deployed, affected persons rescued and retrieved • Data validators/volunteers, medical teams deployed • Volunteers mobilized for relief operations and data		

	gathering /validation / assessment • Relief goods delivered timely and appropriately • Amount of donations generated • Data on Damages accessible to all concerned like, casualties (death, injured, & missing), priority needs • Camp management committees organized • LGU ordinance mandating pre-emptive evacuation of vulnerable families

Table 9 Objectives, Outcomes and Outputs for Disaster Rehabilitation and Response

PILLAR:	**REHABILITATION AND RECOVERY**			
GOAL	**Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle**			
National Objectives	To restore people's means of livelihood and continuity of economic activities and business	To restore shelter and other buildings/ installation	To reconstruct infrastructure and other public utilities	To assist in the physical and psychological rehabilitation of persons who suffered from the effects of disaster
Provincial Objectives	• Rehabilitate people, means of livelihood & sustain economic activities and business • Enhance the skills & capacity on livelihood related activities. To restore install shelter and other vertical structures/ buildings • To provide safer location appropriate engineering that can withstand DRR-CCA. To reconstruct infrastructures & other public utilities • To provide adequate road network & other infrastructure facilities • To provide assistance, physical & psychological depressed persons suffered from effects of disaster			
Provincial Outcomes	• Stable and economic activities provided. Damages, losses & needs properly assessed & analyzed • Shelter/ buildings and living condition back to normal. Houses/ buildings rebuilt or repaired to be more resilient to hazards with safer sites for housing			

	• Disaster & climate change resilient infrastructure constructed/ reconstructed & rehabilitated • Psychologically safe & secure populace protected from the effects of disasters is able to restore to normal functioning • Restored to normal, physical and psychological condition of affected people
Provincial Outputs	• Crops, livestock, fisheries livelihood assistance provided. • Number of P.Os member trained/ capacitated. Number of heads of livestock, poultry restocked • totally damaged houses constructed; partially damaged houses repaired & restored; classrooms constructed; temporarily learning spaces and schools provided/ installed • Post- harvest support facilities established • Number of children & adult provided with awareness child protection • Number of social workers provided with psychological care training

DRRM Priority Plans and Projects

From these provincial objectives, outcomes and outputs, the following priority plans and activities were formulated by the planning team for each DRRM pillar:

A. Disaster Prevention and Mitigation

- Review and integration of DRRM/CCA policies in LGU policies, plans, budgets
- Draft ordinance re QA/QC of infrastructure projects
- Draft ordinance for earthquake trust fund
- Seminar – workshops and capacity building
- Conduct training on green agriculture
- Conduct risk analysis and vulnerability assessment
- Updating hazard maps
- Installing warning and forecasting system
- Disaster Response Manual
- Designate resettlement sites and evacuation centers
- Construction of core houses in resettlement sites
- Flood control measures
- Promote establishment of CCA/DDRM offices in municipalities and DRRM committees in barangays
- DRRM/CCA database systems

B. Disaster Preparedness

- IEC
- Guides / Protocols for Emergency Response Team per Hazard/Disaster
- Conduct regular and periodic drills and simulation exercises
- Integration of DRRM/CCA in school curricula
- Capacity Building and DRRM skills training
- Establishment of Emergency Response Teams at all levels
- Installation of early warning systems, disaster command, communication centers
- Inventory of existing resources
- Provision of insurance to community disaster volunteer groups
- Continuous research on CCA/DRRM
- Establishment of CCA/DRRM – Governance Academy
- Purchase of CCTV Cameras
- Purchase of emergency rescue equipment, dive gears, gadgets
- Stockpiling of commodities
- Formulation of guidelines for the preparation and distribution of relief goods
- Mass blood letting
- IEC and training on food storage, food preservation, seedling and planting materials
- Creation of PDRRM Office
- DRRM Planning workshops for the entire province and preparation of contingency plans
- Monitoring compliance of RA 10121 and CCA RA 9729 and DRRM/CCA Plan implementation
- Enactment of ordinance for pre-emptive evacuation
- Enforcement of building codes
- Formulation of green technologies
- MOA with business / private sectors and NGOs

C. Disaster Response

- Activate Incident Command System (ICS)
- Deployment of SAR Teams & Search, Rescue & Retrieval operations
- Deployment of DANA Teams
- Submission of Disaster Report to the PDRRMC
- Repacking of goods
- Deployment of Relief Teams
- Relief goods distribution
- Conduct of coordination meeting

- Conduct of clearing operations
- Deployment of medical teams
- Deployment of psychosocial teams
- Establishment of first aid tents
- Organization of camp management committees
- Establishment of evacuation centers
- Pre-emptive evacuation
- Profiling of displaced families
- Assessment of factors to determine transition to recovery/ rehab phase
- Cloud-seeding

D. Disaster Rehabilitation and Recovery

- Profiling of displaced families
- Conduct DANA
- Livelihood trainings and projects
- Irrigation canals
- Housing projects
- Relocation sites
- Improvement / renovation of school facilities and procurement of equipment for schools
- skills training for early recovery
- construction and repair of major infrastructures
- Construction/ repair/ rehabilitation of roads, bridges & other vital, infrastructure
- Reconstruction of hospitals, health centers, day care centers Reconstruction of irrigation facilities. Rehabilitation of water
- Acquisition of health equipment Rehabilitation of back canals, dike, drainages, box culvert.
- Repair of flood control facilities
- Trainings/ briefing on stress debriefing

SITUATIONAL ANALYSIS
STRENGTH, WEAKNESSES, OPORTUNITIES AND CHALLENGES

Table 10 **Strengths**

STRENGTHS			
Prevention and Mitigation	**Preparedness**	**Response**	**Rehab and Recovery**
• Faults are already identified • Hazard maps are available • Constant DRRM training • High level awareness on DRRM • Early Warning System installation and advisories • Proactive and operational PDRRMC • Strong tie-up/ linkages with NGOs, NGAs, INGOs • Institutionalized PDRRMO with staff and budget	• Established Command Center • World class weather radars • Availability of updated hazard maps • Strong coordination among stakeholders • Strong support from LCEs, local and foreign entities • Constant DRRM trainings (down to the grassroots level) • Communities now have a high level of awareness on DRRM • Existence of BALDRRMO	• Institutionalization of the inter-cluster coordination approach • Issuance of Eos on SOP, ICS and camp management • Highly skilled and competent emergency response teams, tools and equipment • Availability of local funds • Presence of disaster management related plans	• PGBh data team with PPDO experienced in formulating DRR plan, which made fund sourcing easier • DRR pillar organized/functional • Cooperative/supportive members • Disaster resilience is one of the priority development agenda of the current leadership • Modernization of hospitals and salary increase of medical personnel • Political leaders are quick in rehab/recovery efforts • Airport and piers make DRRM efforts faster/easier • PDRRM/PDRRMC in place • Presence of PDRRMC Command Center

Table 11 Weaknesses

WEAKNESSES			
Prevention and Mitigation	**Preparedness**	**Response**	**Rehab and Recovery**
• Some LGUs don't have institutionalized MDRRMO • Lack of resources/fund since majority of LGUs belong to 4th and 5th class • Difficulty in communication/internet access • Lack of capacity to do CDRA and VA	• Unstable cellphone signal and internet connection • Zoning ordinance not strictly followed • Attitude of local citizens during pre-emptive evacuations	• Majority of MLGUs lack resources/funds • Poor capacities of district hospitals to respond to emergencies of bigger magnitude • Lacks inventory and database on resources, barangay profile • Not all MLGUs have emergency response teams	• Non-inclusion of DOLE, DTI and BEPO in the DRR pillars • Selection/prioritization of DRR beneficiaries subject to political favoritism • Lack of cell sites in remote areas • Presence of sink holes cause damage to roads (new, rehab) • Local funds insufficient to repair/reconstruct damaged structures/facilities • Lack of trained personnel to handle mental health program • Lack of livelihood opportunities for disaster survivors • Problem of potable water supply • Expiration of power/energy contract of 3 distribution utilities is in 2023; no bidding done yet

Table 12 Opportunities

OPPORTUNITIES			
Prevention and Mitigation	**Preparedness**	**Response**	**Rehab and Recovery**
• Annual budgetary allocation for DRRM related programs and projects • Available grants for DRRM • Available international training programs for DRRM • Partnership with private sectors (international and local)	• Foreign funded Early Warning System, infrastructures and equipment • Strong external partnerships and linkages • Availability of foreign researches and trainings • Modern technologies and innovations	• Linkages with INGOs and NGOs • Coordination with NGAs	• Political leaders have close ties with national leaders which may facilitate access to funding • Bohol is known worldwide to international funding agencies • Presence of Bohol Panglao International Airport makes it easier for National and International agencies' DRR efforts • Creation of Disaster Resiliency • Green Building Code • Architecture Law • Cebu-Bohol power interconnection • Implementation of many build-build-build projects creates employment • EO on National Land use policy protects vulnerable farmers • Ease of doing business Law • Malasakit Centers and Zero billing

Table 13 Challenges

CHALLENGES			
Prevention and Mitigation	**Preparedness**	**Response**	**Rehab and Recovery**
• High risk areas/flooding area not properly identified • Presence of sinkholes • Dams dependent on rainfalls • Typhoon prone • Rice fields mostly rain fed • High percentage of contaminated water sources • Lack DRRM related database system	• Not all MDRRMOs are appointed, MDRRM Office is only and attached office of the LCEs • Political issues • Dependent on outside power supply • Delayed construction due to unavailable MGB clearance • Some NGAs, offices lack DRRM equipment • Lack of legislative awareness • Absence of relocation sites for some LGUs • Lack of DRRM information drive for tourists	• Bohol is dependent on power supply from outside • Limited funds from NGAs for emergency response	• RA 9184 – Procurement Law • Bureaucratic red tape in fund release • Rice tariffication law disadvantageous to farmers who are disaster survivors • Source of energy is Leyte (no inland source) making Bohol vulnerable when Leyte power is shut off • Presence of fault lines • Bohol is within Pacific Typhoon belt and ring of fire • Too many piers make Bohol vulnerable to lawless elements and entry of illegal drugs/diseases • Introduction by DOH of vaccines/drugs that are proven safe or still under experimental stage like dengvaxia

Province of Bohol

Provincial Disaster Risk Reduction Management Plan

2020 – 2022

Table 14 PDRRM Plan for Disaster Prevention and Mitigation

	PILLAR: DISASTER PREVENTION AND MITIGATION					
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**					
OBJECTIVE	Implement measures to mitigate the impacts of disasters					
OUTCOME	1. Enhanced awareness of climate of hazards 2. Improved compliance of the Building Code standards 3. Improved monitoring of flood hazards					
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**	**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
				2020	**2021**	**2022**	
Conduct of Climate and Disaster Risk Assessment workshops	5 LGUs/District/year	CDRA for the 5 LGUs	DILG - Lead PDRRMO, LGUs - Partners	200K	200K	200K	PDRRMO Funds DILG Funds LGU share
Draft Ordinance for Quality Control & Quality Assurance of Infrastructure Projects (commercial and residential)	1 ordinance drafted	Approved Ordinance requiring all Infrastructure Projects to comply with Quality Control and Quality Assurance as required by the Building Code of the Philippines	PDRRMO- Lead SP, PEO, DPWH – Partners	20K			PDRRMO Funds
Installation of Early Warning Device in watershed areas	5 EWS installed in Loboc, Abatan, Inabanga, Carood and Manaba Watersheds	Number of EWS installed	PDRRMO – Lead DOST, PAGASA, LGUs – Partners	300K	300K	150K	PDRRMO Funds DOST Funds KOICA/JICA
Updating hazard maps	Provincial Hazard	Number of hazard maps	PPDO- Lead	50K	50K		PDRRMO Funds

	PILLAR: DISASTER PREVENTION AND MITIGATION						
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**						
OBJECTIVE	Implement measures to mitigate the impacts of disasters						
OUTCOME	1. Enhanced awareness of climate of hazards 2. Improved compliance of the Building Code standards 3. Improved monitoring of flood hazards						
(flooding, landslide, earthquake, typhoon)	maps on (flooding, landslide, earthquake, typhoon)		PDRRMO, LGUs, MGB - partners				
Identify & assess resettlement sites & evacuation areas providewide	47 towns assessed	Number of towns assessed and evacuation sites identified	OPSWD – Lead PDRRMO, BALDRRMO, DSWD, MSWDO, MDRRMO	100K	100K	100K	DRRMF
Purchase of lots for resettlement sites	Depends on the area required and the number of residents to be relocated	Number of lots purchased	PDRRMO – Lead PASSO, DSWD, OPSWD - Partners	10M	10M	10M	DRRMF
Construct evacuation center	1 Evacuation Center in Carmen	Evacuation Center	PDRRMO – Lead OCD, DPWH, DILG-Partners		30M		DRRMF, DPWH, OCD
Construction of houses in resettlement areas to relocate families residing in “No Build Zones” areas	Core shelter houses	Number of resettlement houses	NHA –Lead for the housing units HLURB – site development LGUs – lots PDRRMO – Project profiling		20M	20M	National and Local Government Funds International Organizations
Construction of Flood Control Measures Construction of sea walls	Seawalls and flood control structures constructed in	# of flood control structures constructed # of sea walls constructed	PEO – Lead DPWH, PDRRMO	20M	20M	20M	DRRMF

	PILLAR: DISASTER PREVENTION AND MITIGATION						
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**						
OBJECTIVE	Implement measures to mitigate the impacts of disasters						
OUTCOME	1. Enhanced awareness of climate of hazards 2. Improved compliance of the Building Code standards 3. Improved monitoring of flood hazards						
	hazard prone areas						
Planting of mangroves, native tree species and fruit trees			BEMO – Lead DENR, PDRRMO, NGAs	100K	100K	100K	DRRMF
Include DRR-CCA into School Curricula			DepEd – lead				
Intensify IEC on DRMM-CCA to the barangay level or purok level thru the Barangay Emergency Management Training				2M	2M	2M	DRRMF
Conduct of Community advocacy on Habitation Prevention in Risk and Danger zones	# of families living in danger zones		OPSWD – Lead DSWD, PDRRMO, MSWDOs, MDRRMOs	500K	500K	500K	PDRRMF/ MDRRMF
Provide orientation on DRR-CCA to newly appointed personnel in the PLGU/MLGUs				50K	50K	50K	DRRMF
DRRM-CCA Database System Development				100K	100K	100K	DRRMF
Conduct of cloud seeding activity	Provincewide	Number of cloud seeding activity	OPA and DA/BSWM– Lead PDRRMO – funds	2.5M	2.5M	2.5M	PDRRMO Funds BSWM Funds

	PILLAR: DISASTER PREVENTION AND MITIGATION						
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**						
OBJECTIVE	1. Prevent vulnerability & exposure of local swine to ASF viral infection 2. Enhance participation of swine stakeholders to reduce the risk in their livelihood & investment 3. Ensure pork-based food security of the Province						
OUTCOME	1. Vulnerability & exposure of local swine against ASF virus prevented 2. Increased capacities of swine stakeholders to reduce & manage risk in their livelihood & investment 3. Pork-based food security of the province ensured						
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**	**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
				2020	**2021**	**2022**	
Border Control							
Strict Veterinary Quarantine Measures Implemented and Manning of seaports & airports	13 ports & sub-ports (Tagbilaran, Loon, Tubigon, Clarin, Inabanga, Buenavista, Getafe, Talibon, Bien Unido, Ubay, Pres. Carlos P. Garcia, Jagna, Garcia Hernandez), 1 International Airport (Panglao)	Foot baths installed Biosecurity inplaced at ports Disinfectants procured	OPV, VQS, MLGU	200K			PDRRMO Funds
Banning of Imported & Local Pork Products from infected areas	IMPORTED: Belgium, Poland, China, Mongolia, Vietman, Cambodia, Hongkong, Laos, Myanmar, South	Issuance of Executive Orders No. 7, 22 &55 LTFRB has banned the transport of fresh, frozen & processed Pork products & by-products					

	PILLAR: DISASTER PREVENTION AND MITIGATION						
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**						
OBJECTIVE	1. Prevent vulnerability & exposure of local swine to ASF viral infection 2. Enhance participation of swine stakeholders to reduce the risk in their livelihood & investment 3. Ensure pork-based food security of the Province						
OUTCOME	1. Vulnerability & exposure of local swine against ASF virus prevented 2. Increased capacities of swine stakeholders to reduce & manage risk in their livelihood & investment 3. Pork-based food security of the province ensured						
	Korea, North Korea, Indonesia *LOCAL: Pangasinan, Bulacan, Nueva Ecija, Rizal, NCR*	like sausages, ham, etc. In Public Utility Vehicles (PUV) unless with necessary permit					
Established inter-agency collaboration to prevent smuggling of banned products	Issuance of Legal basis	Executive Order # 8 "Adopting an African Swine Fever (ASF) Provincial Preparedness and Contingency Plan, Creating an Executive Committee and a Provincial Task Force for its Implementation, Providing for their Functions and for others Related Purposes"					
Intensification of inspection of passenger luggage in airport & seaports	Hiring & orientation of 20 veterinary quarantine inspectors and	VQI hired Orientation conducted Veterinary quarantine		124,400			

	PILLAR: DISASTER PREVENTION AND MITIGATION						
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**						
OBJECTIVE	1. Prevent vulnerability & exposure of local swine to ASF viral infection 2. Enhance participation of swine stakeholders to reduce the risk in their livelihood & investment 3. Ensure pork-based food security of the Province						
OUTCOME	1. Vulnerability & exposure of local swine against ASF virus prevented 2. Increased capacities of swine stakeholders to reduce & manage risk in their livelihood & investment 3. Pork-based food security of the province ensured						
	airport & port staff	forms provided					
Recall of pork & pork products manufactured after disease outbreak (local & imported)	Monitoring of Market outlets	Surveillance & monitoring team created Malls concessioners & meat outlets monitored Banned products Recalled / confiscated					
Information Education Campaign	Travelers, meat establishment operators, HRIs, livestock handlers, food concessioners, bus operators, meat outlets	15 trainings, briefings & orientations conducted					
	Conduct of 2 Orientations/ briefings	Orientations/ briefings conducted		58,500			
Production of IEC	Infographic	13 ports & 1 airport		120K			

	PILLAR: DISASTER PREVENTION AND MITIGATION						
GOAL	**AVOID HAZARDS AND MITIGATE THEIR POTENTIAL IMPACTS BY REDUCING VULNERABILITIES AND EXPOSURE AND ENHANCING CAPACITIES OF COMMUNITIES**						
OBJECTIVE	1. Prevent vulnerability & exposure of local swine to ASF viral infection 2. Enhance participation of swine stakeholders to reduce the risk in their livelihood & investment 3. Ensure pork-based food security of the Province						
OUTCOME	1. Vulnerability & exposure of local swine against ASF virus prevented 2. Increased capacities of swine stakeholders to reduce & manage risk in their livelihood & investment 3. Pork-based food security of the province ensured						
materials	presentation, Leaflets Tarpaulins Travel Advisories	provided with AVP (English/ Visayan version) 120,000 copies of leaflets with Chinese & Korean translation distributed monthly # of tarpaulins Airlines announcement in English & Tagalog					
Campaign on No to Swill Feeding & Proper Disposal of Food Waste	HRIs	# of trainings conducted # of participants					
Orientation on Proper Biosecurity Measures	Backyard Swine Raisers	# of trainings conducted # of participants					
-Media							
Disease Monitoring/ Progression Movement & Spread from Affected Areas	Daily monitoring of disease incidence in affected areas	Updated information on the latest affected areas					

Table 15 PDRRM Plan for Disaster Preparedness

	PILLAR: DISASTER PREPAREDNESS
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**
OBJECTIVE	Increase the level of awareness of the community to the threats and impacts of hazards, risks and vulnerabilities.
OUTCOME	Increased level of awareness and enhanced capacities of communities to the threats and impacts of all hazards.

PROGRAM/PROJECTS/ ACTIVITIES	TARGETS	KEY OUTPUTS	RESPONSIBLE PERSON/AGENCY		TIMEFRAME/BUDGET			SOURCE OF FUNDS
					2020	2021	2022	
			Lead Agency	Partner Agency				
Conduct of DRRM-CCA Summit	Student leaders, DepEd DRRM Focal, SSG Adviser of 54 Districts LDRRMOs	Summit	PDRRMO	DepEd DILG				LDRRMF
Formulation/ Preparation/ reproduction of DRR CCA materials		IEC Materials	PDRRMO	DepEd DILG PAGASA				LDRRMF
Distribution of IEC materials on DRR CCA	1,116 Public Schools, 1109 Barangays , All Government Offices	IEC Materials	PDRRMO					
Conduct regular awareness or IEC campaign on DRR CCA with regular radio plugging in local radio	Medium: All AM/FM stations ICM/Alturas/	Advertisement	PDRRMO					

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	Increase the level of awareness of the community to the threats and impacts of hazards, risks and vulnerabilities.							
OUTCOME	Increased level of awareness and enhanced capacities of communities to the threats and impacts of all hazards.							
stations/ movie houses / seacrafts/ aircrafts: - Standard Manual of Operations - Guide for Emergency Response Team - Family Guide to Action - Distribution of Goods - Building Code Advocacy - Promotion of Green Technology	BQ Movie houses Ocean jet/ Island Water/ Supercat / Lite Ferries / Trans-Asia, etc							
Implementation of Operation Listo- Gabay at Mapa	5 Parent Leaders / City/ Municipality	Evacuation Plan/ Gabay at Mapa Plan	PDRRMO	DILG				

	PILLAR: DISASTER PREPAREDNESS
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**
OBJECTIVE	• Equip the community with the necessary skills to cope with the negative impacts of disasters • Increase the capacity of institutions
OUTCOME	• Communities are equipped with necessary skills and capability to cope with the impacts of disaster • Increased DRRM and CCA capacity of local DRRM Councils and offices at all levels

PROGRAM/PROJECTS/ ACTIVITIES	TARGETS	KEY OUTPUTS	RESPONSIBLE PERSON/AGENCY		TIMEFRAME/BUDGET			SOURCE OF FUNDS
			Lead Agency	Partner Agency	2020	2021	2022	
Conduct of skills re training LDRRMOs Drills and Exercises for specific hazards (eg, Earthquake) Fire Drills	48 LDRRMOs	Skills Training/ Drills	PDRRMO	BFP				LDRRMF
Conduct of Collapsed Structure Search and Rescue (CSSR) for TaRSIER Personnel	20 Personnel	Training	PDRRMO					
Conduct of High Threat Emergency (HTEC) for TaRSIER Personnel and LDRRMOs	20 Personnel	Training	PDRRMO					
Conduct of Management of the Dead and the Missing Training (MDM) for TaRSIER 117	20 TaRSIER 50 DILG Personnel 48 LDRRMOs	Training	PDRRMO	DILG				

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Equip the community with the necessary skills to cope with the negative impacts of disasters • Increase the capacity of institutions							
OUTCOME	• Communities are equipped with necessary skills and capability to cope with the impacts of disaster • Increased DRRM and CCA capacity of local DRRM Councils and offices at all levels							
Personnel, LDRRMOs, DILG Personnel, and NBI	10 PDRRMOs 2 NBI							
Conduct of IV Therapy Training for TaRSIER 117	20 Personnel	Training	PDRRMO					
Conduct of EMT-B Training for TaRSIER 117	20 Personnel	Training	PDRRMO					
Conduct of EOC Training for TaRSIER 117/ PDRRMO/PDRRMC	20 Personnel	Training	PDRRMO					
Conduct of ICS Ladderized Course for PDRRMC Members	30 Members	Training	PDRRMO					
Conduct of ICS Ladderized Course for TaRSIER 117	20 Personnel	Training	PDRRMO					
Conduct of Basic Water Safety and Rescue Training for DepEd DRRM Focal	56 DepEd DRRM Focal	Training	PDRRMO	DepEd				
Conduct training for K9 Units	8 K9 and handlers	Training	PDRRMO					
Benchmarking Activity -DAVAO 911 -Taipei, Taiwan	20 Personnel	Benchmarking Activity	PDRRMO					

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Equip the community with the necessary skills to cope with the negative impacts of disasters • Increase the capacity of institutions							
OUTCOME	• Communities are equipped with necessary skills and capability to cope with the impacts of disaster • Increased DRRM and CCA capacity of local DRRM Councils and offices at all levels							
-Boracay								
Conduct of training to Rain Gauge Observers	96 Observers	Training	PDRRMO	PAGASA				
Conduct of Critical Incident Stress Debriefing Training for PDRRMC Members	30 Members	Training	PDRRMO					
Conduct capacity building for Safety Health Accreditation Policy Standards	15 Personnel	Training	PDRRMO					

	PILLAR: DISASTER PREPAREDNESS
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**
OBJECTIVE	• Equip the community with the necessary skills to cope with the negative impacts of disasters • Increase the capacity of institutions
OUTCOME	• Communities are equipped with necessary skills and capability to cope with the impacts of disaster • Increased DRRM and CCA capacity of local DRRM Councils and offices at all levels

PROGRAM/PROJECTS/ ACTIVITIES	TARGETS	KEY OUTPUTS	RESPONSIBLE PERSON/AGENCY		TIMEFRAME/BUDGET			SOURCE OF FUNDS
			Lead Agency	Partner Agency	2020	2021	2022	
Establishment of a Unified Command Center	1 Unified Command	1 Unified Command	PDRRMO					LDRRMF
Establishment of EWS per LGU -CCTV -Wifi with the enhancement of TaRSIER App	48 LGUs	Enhanced EWS	PDRRMO					
Purchase Emergency Response Vehicles	7 ERV- 2020 2 ERV- 2021 2-ERV 2022 3 Sea Ambulance 3 Rescue Trucks	Emergency Response Vehicles	PDRRMO					
Purchase of Disaster Response Equipment -SRR -WASAR -EMS		Disaster Response Equipment	PDRRMO					

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Equip the community with the necessary skills to cope with the negative impacts of disasters • Increase the capacity of institutions							
OUTCOME	• Communities are equipped with necessary skills and capability to cope with the impacts of disaster • Increased DRRM and CCA capacity of local DRRM Councils and offices at all levels							
Stockpiling of Basic Emergency Supplies / Prepositioning of Goods a. Batteries b. Potable water c. Portable generator, solar-powered generator, flashlights d. Food packs: rice, canned goods, ready to eat meals (min. of 10% population at risk, good for 3 days) e. Tires for emergency vehicle f. Fuel and gasoline (in coordination with BFP) g. Clean delivery kits (emergency birthing kits) h. Dignity kits for women	500 Foodpacks, Emergency Supplies, Dignity Kits	Basic Emergency Supplies/ Good	PDRRMO					
Purchase of Manual Rain Gauges	Purchase of Manual Rain Gauges	Rain Gauge	PDRRMO	PAGASA				

	PILLAR: DISASTER PREPAREDNESS
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**
OBJECTIVE	• Develop and implement comprehensive local disaster preparedness policies, plans and systems • Strengthen partnership among all key players and stakeholders
OUTCOME	• Developed and implemented comprehensive local preparedness and response policies, plans and systems • Strengthened partnership and coordination among all key players and stakeholders

PROGRAM/PROJECTS/ ACTIVITIES	TARGETS	KEY OUTPUTS	RESPONSIBLE PERSON/AGENCY		TIMEFRAME/BUDGET			SOURCE OF FUNDS
			Lead Agency	Partner Agency	2020	2021	2022	
Formulation / Pass an Ordinance providing for hazard pay /allowances to the TaRSIER 117 and PDRRMO	1 ordinance	Ordinance	PDRRMO	PDRRMC Sangguniang Panlalawigan				LDRRMF
Formulation / Updating of Contigency Plan -Typhoon -Flooding -Storm Surge -Earthquake -Rain-Induced Landslide	5 Contingency Plans	Contingency Plans	PDRRMO	OCD				
Updating of Local Climate Change Action Plan	1 LCCAP	LCCAP	PDRRMO	PPDO, BEMO, DILG				
Creation of Camp Coordination and Camp Management Committees	1 CCCM Committee / LGU	CCCM Committee	PDRRMO	OPSWD				
Establish MOA or MOU between and among the	14 MOAs / MOUs	MOAs / MOUs	PDRRMO					

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Develop and implement comprehensive local disaster preparedness policies, plans and systems • Strengthen partnership among all key players and stakeholders							
OUTCOME	• Developed and implemented comprehensive local preparedness and response policies, plans and systems • Strengthened partnership and coordination among all key players and stakeholders							
appropriate agencies or organizations -Bohol Medical Society -AMHOP -PHA Bohol Chapter -Red Cross -PNA -Bantay Bayan -Pharmacy -Supermarket -Funeral Home -Hospital -Gasoline Stations -Telecommunication -Neighboring Province -Transport Groups								
Formulation of Disaster Response Operations Manual	1 Operations Manual	Operations Manual	PDRRMO					
Organization and Training of Community Volunteers on DRRM		# of community volunteers organized	PDRRMO OPSWD	DSWD, MSWDOs, MDRRMO	500K	500K	500K	PDRRMF, MDRRMF

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Develop and implement comprehensive local disaster preparedness policies, plans and systems • Strengthen partnership among all key players and stakeholders							
OUTCOME	• Developed and implemented comprehensive local preparedness and response policies, plans and systems • Strengthened partnership and coordination among all key players and stakeholders							
				s				
Training on Community Volunteers on Camp Management/Camp Coordination		# of community volunteers trained	PDRRMO OPSWD	DSWD, MSWDOs, MDRRMOs	500K	500K	500K	PDRRMF, MDRRMF

	PILLAR: DISASTER PREPAREDNESS
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**
OBJECTIVE	• Strict implementation of related veterinary quarantine policies & local ordinances & related issuances; • Enhance capacities of the LGU to eliminate risk of disease contamination; • Increase disease awareness & responsibilities among swine industry stakeholders & partners agencies.
OUTCOME	• Developed and implemented comprehensive local preparedness and response policies, plans and systems • Strengthened partnership and coordination among all key players and stakeholders

PROGRAM/PROJECTS/ ACTIVITIES	TARGETS	KEY OUTPUTS	RESPONSIBLE PERSON/AGENCY		TIMEFRAME/BUDGET			SOURCE OF FUNDS
			Lead Agency	Partner Agency	2020	2021	2022	
Creation of ASF Council & Task Force	1 Provincial 1 City 47 Municipal	Executive Order No. 8 “ 1 Provincial 1 City 6 Municipalities	LCEs	OPV				
Creation of Quick Response Team - Identification of team members - Provision of PPEs & logistical supplies	3 Teams	QRT identified and mobilized	OPV					
Establishment of Early Warning System at the Provincial, Municipal & Barangay Level & Intensification of surveillance through field personnel	47 municipalities 1 city 1,109 barangays	Developed reporting tools Training of Barangay Livestock Aides, Livestock Technicians on disease recognition & reporting						

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Strict implementation of related veterinary quarantine policies & local ordinances & related issuances; • Enhance capacities of the LGU to eliminate risk of disease contamination; • Increase disease awareness & responsibilities among swine industry stakeholders & partners agencies.							
OUTCOME	• Developed and implemented comprehensive local preparedness and response policies, plans and systems • Strengthened partnership and coordination among all key players and stakeholders							
Training of Veterinarians on proper collection & submission of samples	6 veterinarians Procurement of supplies & PPEs	# of trained veterinarians # and type of supplies & PPEs procured	DA- RADDL OPV		200K			
Technical skills training on livestock emergency guidelines through workshops, seminars & simulation	Veterinarians, Livestock technicians, BALA, farm owners, VQIs	# of seminars conducted # of participants trained	DA, OPV		185,250			
Strengthening ASF control through traceability of meat source & meat inspection	Conduct orientation for Meat inspectors & Meat Handlers	Policy on issuance of Veterinary Health Certificate prior to Slaughter implemented NMIS Memo Issued	NMIS	OPV				
		# of joint consultative meetings/ orientations conducted			192,150			
Awareness & education campaign on Biosecurity	Trainings of Swine Raisers, government & private stakeholders		DA, OPV, MLGU					
Surveillance & Reporting	Farms, Slaughterhouse	# of cases investigated and profiled	NMIS, DTI, DA, OPV,					

	PILLAR: DISASTER PREPAREDNESS							
GOAL	**Establish and strengthen capacities of communities to anticipate, cope and recover from the negative impacts of emergency occurrence and disasters.**							
OBJECTIVE	• Strict implementation of related veterinary quarantine policies & local ordinances & related issuances; • Enhance capacities of the LGU to eliminate risk of disease contamination; • Increase disease awareness & responsibilities among swine industry stakeholders & partners agencies.							
OUTCOME	• Developed and implemented comprehensive local preparedness and response policies, plans and systems • Strengthened partnership and coordination among all key players and stakeholders							
	s, Market place	# of sample collected and submitted # of meat shops/ retailers monitored	C/MLGU					

Table 16 PDRRM Plan for Disaster Response

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	To deploy SAR Teams & Security Forces to the scene within 8 hours							
OUTCOME	Zero preventable deaths. Low disabilities secondary injuries.							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Activate IMT Deployment	2 planned events	# of deployments	PDRRMO, TaRSIER 117	AFP,PNP, BFP, PCG, OCD, DSWD	2M	2M	2M	DRRMF
Deployment of SAR Teams & Search, Rescue & Retrieval operations		Response time of deployment # of SRR Deployment	PDRRMO, TaRSIER 117	AFP,PNP, PCG	1M	1M	1M	DRRMF

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	To conduct immediate relief operation within 24 hours (food & non-food items) & deployment of WATSAN Team							
OUTCOME	Immediate relief provided to affected families. Inventory (list). Masterlist of donors							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Repacking of goods	500 food packs	# of relief goods packed	OPSWD	PDRRMO DSWD, INGOs, NGOs	1.5M	1.5M	1.5M	DRRMF/ DSWD
Deployment of Relief Teams For Relief goods distribution		# of relief distributions	OPSWD	PDRRMO , DSWD, PEO, PMPO	1M	1M	1M	DRRM QRF & DSWD

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	To provide immediate medical services to disaster victims including Psychological first aid							
OUTCOME	Help victims surpass mental & psychological trauma							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Provision of Emergency Medical Services		# of medical teams deployed	PHO	DOH	1M	1M	1M	QRF, DOH
Management of evacuation centers		# of evac centers managed	OPSWD	PDRRMO , DSWD, MLGUs	2M	2M	2M	QRF
Establishment of Child Friendly Spaces & Women Friendly Spaces		# of Child Friendly Spaces # of Women Friendly Spaces	OPSWD	DSWD, MSWDOs . MLGUs				QRF
Enforcement of Pre-emptive evacuation		# of families evacuated	MLGUs, MDRRMOs	PDRRMO	1M	1M	1M	QRF, MLGUs
Deployment of psychosocial teams		# of stress debriefing conducted # of persons debriefed	OPSWD	DSWD, PHO, PDRRMO , CSOs	1M	1M	1M	GF (OPSWD)
Profiling of displaced families & Assessment of factors to determine transition to recovery/ rehab phase		# of families assessed	OPSWD	DSWD, MSWDOs	1M	1M	1M	QRF, DSWD
Conduct assessment on the impact of children			OPSWD	DSWD, MSWDOs				

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	To provide immediate medical services to disaster victims including Psychological first aid							
OUTCOME	Help victims surpass mental & psychological trauma							
affected by disaster								
Provision of financial assistance to affected families		# of recipient families provided with financial assistance	OPSWD	PDRRMO , DSWD	1M	1M	1M	QRF
Conduct of clearing operations		# of clearing operations conducted	PGSO, PEO, PMPO	DPWH	1M	1M	1M	DRRMF

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	To conduct Rapid Damage Assessment and Needs Analysis (RDANA) by the LDRRMC							
OUTCOME	Coordinated, integrated system & timely appropriate responses provided & implemented							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Deployment of DANA Teams		# of deployment	PDRRMO	OCD, AFP, PNP, BFP, PCG, MLGUs	1M	1M	1M	DRRMF

	PILLAR: DISASTER RESPONSE								
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER								
OBJECTIVE	To conduct Rapid Damage Assessment and Needs Analysis (RDANA) by the LDRRMC								
OUTCOME	Coordinated, integrated system & timely appropriate responses provided & implemented								
Conduct of coordination meeting		# of coordination meetings conducted	OPSWD	PDRRMO	1M	1M	1M	DRRMF	
Submission of Disaster Report to the PDRRMC		# of reports submitted	PDRRMO						

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	1. Prevent Further Contamination of Infection or Containment of Infection 2. Minimize Economic Impact							
OUTCOME	Disease Outbreak Controlled & Eradicated							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Establishment of Quick Response Mechanism			OPV, ASF Provincial Committee					DRRMF
Formulate protocols and guidelines when to respond	1	Protocols and guidelines formulated	OPV					DRRMF
Establishment of outbreak zones -Identify and procure necessary materials & supplies	# of disinfectants, electric stunner, gloves, mask, boots, goggles, test tubes, cottons, alcohol, zip lock, pig restrainers, vacutainer with adoptor and needle, syringes, disposable PPEs	Materials and supplies procured	OPV		1M			
Identify machineries and equipment	Backhoe, dumptruck, tractor with	Machineries and equipment identified	OPV	PEO, Motorpool, MLGU				

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	1. Prevent Further Contamination of Infection or Containment of Infection 2. Minimize Economic Impact							
OUTCOME	Disease Outbreak Controlled & Eradicated							
	trailer, wheelbarrow							
Establishment of Incident Command System			PDRRMO	OPV, PLGU, MLGU, BLGU				
Create structure and identify roles and responsibilities of teams and members of team	Incident Command Center	Structure created and roles and responsibilities of teams and members identified						
Prepare materials and Supplies ready for use		Materials and stockpile of supplies readily available for immediate use						
Coordination meetings with line and partner agencies		Coordination meetings with line and partner agencies conducted	OPV		90K			
Management of disease control eradication			OPV	BAI-VQS, PNP,PCG, PPA				
Harmonize issuances regarding animal and products movement and border control		Zones using the 1-7-10 protocol identified and established						
Control of active surveillance		Samples collected and submitted for disease confirmation	OPV	DA-RADDL, MLGU, BLGU				

	PILLAR: DISASTER RESPONSE							
GOAL	PROVIDE LIFE PRESERVATION AND MEET THE BASIC SUBSISTENCE NEEDS OF AFFECTED POPULATION BASED ON ACCEPTABLE STANDARDS DURING OR IMMEDIATELY AFTER A DISASTER							
OBJECTIVE	1. Prevent Further Contamination of Infection or Containment of Infection 2. Minimize Economic Impact							
OUTCOME	Disease Outbreak Controlled & Eradicated							
Conduct of stamping animals in declared affected farms		Stamping out conducted	OPV	PNP, MLGU				
Identify burial sites for safe disposal of affected and potentially affected swine		Burial sites identified	MLGU, BLGU, DENR					
Decontamination and mandatory closure of affected farms		Affected farms disinfected and operation closed	OPV	MLGU, PNP,BLGU				
Provision of indemnity fund to affected farmers			PLGU					
- Formulate guidelines		Guidelines formulated						
- Lobby funds		Funds allocated			10M			DRRM Fund

Table 17 PDRRM Plan for Disaster Rehabilitation and Recovery

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	To rehabilitate people's means of livelihood & sustain economic activities & business							
OUTCOME	Stable and viable economic activities provided							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Conduct of post-disaster damage assessment		Standardized template on data gathering Crops, livestock, fisheries, livelihood assistance provided	PDRRMC/ PDANA Team	DSWD, OCD, PHIVOLCS, MGB, UNDP, ILO, DOLE, DTI, OPV, OPSWD, BFAR, BEMO, POs, DA, WORLD FOOD	0.5M	0.5M	0.5M	PDRRMO Funds/ Municipal Funds

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	To enhance the skills & capacities on livelihood related activities							
OUTCOME	Damages, losses, & needs properly assessed and analyzed							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Conduct disaster needs assessment (DANA) on capacity building for LGUs & partners.		Number of P.O members trained & capacitated			1M	1M	1M	QRF
Seaweeds Production, Mushroom Culture, Bangus Culture in cages, Loom & Basket Weaving		Volume of seaweed seedlings provided			3M	3M	3M	DRRMF
Bagging of assorted vegetables & fruit trees		Number of heads of livestock, poultry, chicken restocked			500K	500K	500K	DRRMF
Cash for work program on coconut planting, bamboo planting, and seaweeds		35 fishpond operators availed of bangus fingerling	PDRRMC/ PDANA Team	BFAR, OPA, ILO, LGUs, DSWD, OPSWD, DEPED, BEMO, OPA, INGOs, NGOs, DA,	22M	17M	17M	PDRRM Funds, BFAR, PGBh, DRR Fund, DSWD, DA, OPSWD
Cash for work program on the Irrigation Canals.								
Cash for work activities (emergency assistance to disaster survivors)		Number of basket & loom weaving assistance restored in 9 municipalities.						
Crops, livestock & other agri-support facilities								
Rehab of markets &								

	PILLAR: DISASTER REHABILITATION AND RECOVERY								
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the “building back better” principle								
OBJECTIVE	To enhance the skills & capacities on livelihood related activities								
OUTCOME	Damages, losses, & needs properly assessed and analyzed								
slaughter houses in 10 municipalities.									

	PILLAR: DISASTER REHABILITATION AND RECOVERY								
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the “building back better” principle								
OBJECTIVE	To restore/ install shelter & other vertical structures/ buildings.								
OUTCOME	Shelter, buildings and living condition back to normal.								
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**	
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**		
Housing project		totally damaged houses constructed. partially damaged houses repaired & restore classrooms constructed. Debris management.	NNA, HUDCC, NHMFC	DPWH, DA, City Government, Municipal Government, PEO, DOLE	100M	100M	100M	NHA, PAG-IBIG, DepEd, DSWD	
Relocation sites for shelter project.									
Reconstruction/ repair of school buildings/ classrooms.									

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	To provide safer location & appropriate engineering design tool that can withstand DRRM- CCA							
OUTCOME	Houses, buildings rebuilt or repaired to be more resilient to hazards with safer sites for housing.							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Procurement of school facilities/ equipment.		Number of ports/ sub-ports repaired & constructed. Number of airport repaired Provincial, Municipal, Barangay, public buildings repaired/ reconstructed.	DEPED, TESDA, DOLE	UN-HABITAT For Humanity, DSWD, WORLD VISION, PRIVATE SECTOR, ILO, TESDA	20M	20M	20M	DepEd, DSWD, DOLE, DPWH
Skills training program for early recovery			DEPED, TESDA, DOLE	UN-HABITAT For Humanity, DSWD, WORLD VISION, PRIVATE SECTOR, ILO, TESDA	20M	20M	20M	DepEd, DSWD, DOLE, DPWH
Repair of Provincial/ City Municipal buildings		Provincial, Municipal, Barangay, public buildings repaired/ reconstructed.						
Construction/ repair of various major ports & sub-ports & airports		Number of ports/ sub-ports repaired & constructed. Number of airport repaired						

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	To reconstruct infrastructures & other public utilities							
OUTCOME	Disaster & climate change resilient infrastructure construct and rehabilitated							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Construction/ repair/ rehabilitation of roads, bridges & other vital, infrastructure.		Number of health facilities repaired & rehabilitated 1 hospital constructed Cultural heritage; i.e. churches reconstructed/ restored Number of kilometers of road rehabilitated Number of Irrigation facilities rehabilitated	PEO, DPWH	DPWH, CAAP, NCCA, PICE, UAP, MEs	90M	90M	90M	DPWH, PPA/ DOTC, PEO

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	To provide adequate road network & other infrastructure facilities							
OUTCOME	Passable & usable public utilities.							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Reconstruction, rehabilitation of dikes, canals, water facilities, flood control systems		Number of canals, dike, drainage rehabilitated Number of water facilities rehabilitated Number of flood control facilities repaired	PEO, DPWH	PICE, UAP, WHO, UNICEF	10M	10M	10M	DPWH, PEO,

	PILLAR: DISASTER REHABILITATION AND RECOVERY								
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle								
OBJECTIVE	To provide to physical & psychological depressed persons suffered from the effects of disaster								
OUTCOME	Psychologically safe & secure populace protected from the effects of disaster is able to restore to normal functioning Restored to normal physical & psychological condition of affected people								
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**	
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**		
Conduct of psychosocial debriefing activities		Number of children & adult provided with awareness & child protection. Number of social workers provided with psychological care training. Psychosocial intervention trainings & care provided	PHO, DOH, OPSWD, DSWD	RHU, WHO, UNICEF, PMO, UNI FPA IOM, DSWD, PNP, CFSI, Save the Children, DepEd, AFP, PAGCOR	5M	5M	5M	DOH, DSWD, OPSWD	

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	1. To rehabilitate people's means of livelihood 2. To enhance the skills and capacitate on livelihood related activities such as strengthening animal health program and biosecurity.							
OUTCOME	Attain disease freedom on areas affected							
PROGRAM/PROJECTS/ ACTIVITIES	**TARGETS**	**KEY OUTPUTS**	**RESPONSIBLE PERSON/AGENCY**		**TIMEFRAME/BUDGET**			**SOURCE OF FUNDS**
			Lead Agency	Partner Agency	**2020**	**2021**	**2022**	
Establishment of containment zone free ASF areas	Active surveillance for verification from ASF disease areas	Negative results	OPV	DA-RADDL, MLGU	30 Days for 3 consecutive intervals			PDRRMO Funds/ Municipal Funds
	Introduce sentinel pig at 10% of stocking rate	100% sentinel pigs free from ASF disease	OPV	DA-RADDL, MLGU	Observe daily for 6 weeks from the time of introduction			
Dispersal program/ restocking	Damage Assessment	List of Affected farmers and numbers of damage animals	MLGU, BLGU		24 Hours after stampi			

	PILLAR: DISASTER REHABILITATION AND RECOVERY							
GOAL	Restore and improve facilities, livelihood and living conditions and organizational capacities of affected communities, and reduced disaster risks in accordance with the "building back better" principle							
OBJECTIVE	1. To rehabilitate people's means of livelihood 2. To enhance the skills and capacitate on livelihood related activities such as strengthening animal health program and biosecurity.							
OUTCOME	Attain disease freedom on areas affected							
					ng out			
	Provide breeding animals to affected farmers	Availability of parent stock	PLGU	MLGU, Nat. Agency (DSWD, DA)	365 Days after ASF free declaration	5M		
Capacity Development	Conduct technical trainings	Improved husbandry practices	OPV	MLGU	6 Months before provision of animals			
Implementation of health program	Procure and distribute biologics/ vaccines	Disease incidence reduced	OPV	MLGU	From stocking date			

4.0 SUMMARY OF INDICATIVE BUDGET

PDRRM PLAN 2020-2022

PILLAR	1ST SEMESTER 2020	2ND SEMESTER 2020	1ST SEMESTER 2021	2ND SEMESTER 2021	1ST SEMESTER 2022	2ND SEMESTER 2022	TOTAL
Disaster Prevention and Mitigation	25.647M	10.776M	60.13M	25.77M	38.99M	16.71M	178.023M
Disaster Preparedness	159.047M	67.83M	84.28M	36.12M	84.98M	36.42M	468.677M
Disaster Response	24.850M	6.3M	14.76M	6.3M	14.76M	6.3M	73.270M
Disaster Recovery and Rehabilitation	250M	72M	191.9M	80.1M	186.9M	80.1M	861M
TOTAL	459.544M	156.906M	351.07M	148.29M	325.63M	139.53M	1,580.97M

5.0 PDRRM Plan Monitoring and Evaluation

Feedback mechanisms are important aspects of gauging performance targets and learning from our experiences on the ground. The NDRRMP, being a long plan which transcends various administrations and leaderships, need to be constantly looked into in terms of its relevance and impact on the changing situations on the ground.[14]
The NDRRM Plan further suggests that -

1. Monitoring and evaluation are essential components of results-based programming in DRRM as these will ensure that the plan's on-time implementation and that learnings from past experiences become input to the plan altogether. Also, through monitoring and evaluation activities, appropriate and needed revisions and/or changes can be identified, from the identified activities to the implementation mechanisms, in case more appropriate ones are realized.

2. These will be led by the Office of Civil Defence, in close coordination with the four vice chairpersons of the NDRRMC by focusing on relevance, effectiveness, efficiency, impact and sustainability. A standard monitoring and evaluation template will be developed by the OCD together with the members of the Technical Management Group.

3. Primarily, monitoring and evaluation will be based on the indicators, targets and activities identified in each of the four priority areas on DRRM. The indicators set in the NDRRMP will be applicable to both the national and local levels. The national level targets will be monitored by the lead and implementing agencies, in close coordination with the regional and local DRRM councils. Each lead agency will in turn submit reports to the respective vice chairperson of the NDRRMC in charge of the specific priority area.

4. The local level targets will be operationalized depending on the needs and situation on the LGU. These will be captured in the respective local DRRM plans which the LGUs need to develop through their respective local DRRM offices and councils. Customization of the targets will depend on the risk assessments and analysis done in their respective local areas. The local DRRM plan will be mainstreamed into the CDP and CLUP and will form part of the LGU mandated plans.

5. Monitoring and evaluation will also include an audit report on the use and status of the National DRRM Fund and how the said fund contributed to the attainment of the NDRRMP.

[14] NDRMM Plan, p35

The Provincial Government of Bohol has an institutionalized Provincial Monitoring and Evaluation System (ProMES) that will be used in the conduct of M&E for the PDRRM Plan.
LDRRM Planning participants agreed to periodically and regularly monitor outputs, tracking accomplishments vis-à-vis targets, and outcomes, which are significant changes in people's knowledge, skills and attitudes as well as transformations at the institutional and community level.

Monitoring and Evaluation Framework

The following table was agreed upon by LDRRM Planning Workshop participants as the M&E Framework of the Bohol PDRRM Plan:

Table 18 PDRRM Plan Monitoring and Evaluation Framework

Areas	Description
What are to be monitored:	• Kinds and types of plans, programs and activities • Targets versus accomplishments • Performance indicators • Fund utilization • Status of implementation whether ongoing, completed or spent / expended / disbursed or paid and not just earmarked • Percentage of accomplishments, both physical and financial • Facilitation factors • Hindering factors • Level of PLGU and stakeholder support and cooperation
Who will monitor?	1. Provincial Monitoring and Evaluation Team (ProMES) led by the Project Development and Monitoring Unit (PDMU) of the Provincial Planning and Development Office (PPDO) 2. Administrative and Training Office of the PDRRMO (per Executive Order by the Governor) 3. Representative from the PDRRMO per Memorandum Order by the Governor 4. Head of the PDRRM Office 5. Civil Society and Private Sector representatives
How often is Monitoring	• Implementing offices conduct monthly progress

Areas	Description
and Evaluation done?	monitoring of activities where their offices are the implementers • Quarterly performance monitoring • Semi-annual monitoring report • Annual assessment and evaluation
How will monitoring data and information be shared?	• Prescribed monitoring templates will be used by implementing offices / departments • ProMES monitoring templates will also be used, especially for quarterly, semi-annual and annual reporting for easy consolidation by the PDMU-PPDO • Hard and soft copies of monitoring and evaluation reports
To whom will monitoring data be reported or shared? Who are the users of the data?	a) Provincial Governor b) Provincial Vice-Governor c) Sangguniang Panlalawigan d) Provincial Disaster Risk Reduction Management Council e) Management Executive Board (MEB) f) Office of Civil Defense (OCD) g) Provincial Development Council (PDC) h) General Public and Stakeholders
How and in what form will monitoring data be reported or shared?	• Printed and hard copies of monthly, quarterly, semi-annual and annual report • Electronic files posted in the PGBh website for web-based and online reporting and feedback • Film shows and video clips through the Effective Development Communication (EDCom) Office • Photo files and photo clips • Activity documentation reports

Monitoring and Evaluation Template

Workshop participants agreed that the following monitoring template will be used for the annual monitoring and evaluation report.

Table 19 PDRRM Plan Monitoring and Evaluation Template

Activity	Targets (Performance Indicators)	Actual Accomplishments (Actual vs Targets) In %	MOVs (Means of Verification)	Facilitating Factors	Hindering Factors

6.0 PDRRM Plan Sustainability and Communication Plan

Sustainability Plan

The planning process is just the preparation of the LDRRM Plan. More needs to be done after the planning workshop to ensure plan sustainability. A Sustainability Plan aims to continue what has been started. Sustainability generally includes

- ✓ Institutionalization by legislation
- ✓ Increasing ownership by funding from own-sourced funds
- ✓ Providing permanent implementation arrangements and administrative support (people, offices, budgets, etc.)

Table 18 below summarizes the Sustainability Plan agreed by stakeholders:

Table 20 Sustainability Plan of the PDRRM Plan

Sustainability Plan	
Policy Support	**Implementation Arrangements**
• An order institutionalizing PDRRM-CCA CTR/ OFFICE	• Adoption of IRRs for measures passed.
• Resolution authorizing the governor to enter into MOA with private sectors for availability of foods/ services in times of calamity/ crisis.	• Appropriate structure within the PDRRMO recommending the 4 pillars with separate in-house monitoring officer. • Network/ collaborate with private, business, civil society, NGA, International donors, humanitarian agency & other key players. • PDRRMC secretariat OPSWD • PDC secretariat- PPDO • Sangguniang Panlalawigan.
• Resolution penalizing the private sector/ establishment for refusal to	

provide goods/ services in the times of calamity.	
• Ordinance creating an earthquake trust fund.	
• Ordinance creating quality control assurance system ensuring compliance with construction standards or building code. • PDRRMC resolution approving the DRRM/ CCA plan. • PDC resolution approving the DRRM/ CCA plan • SP resolution adopting the plan. • Ordinance creating the PDRRMO	• A functional and operational Provincial Disaster Risk Reduction Management Office (PDRRMO) who will provide the steering structure to implement the Plan.

Communication Plan

Plans need to be communicated and shared to stakeholders to ensure their continuance and sustainability. This is to disseminate information to stakeholders about the plan and in the process generate "buy-in" from all sectors. The PDRRM Plan needs to be "owned" by Boholano leaders and communities to ensure its successful implementation. A plan that is known, understood, appreciated / valued will most likely generate more participation in its implementation.

- A plan to disseminate information about the Plan
- Generate "buy-in" from all sectors and stakeholders
- Intended to increase "ownership" of the Plan
- A plan that is known, understood, appreciated / valued will most likely generate more participation in its implementation

Table 21 PDRRM Communication Plan

Key Messages to be Communicated to Stakeholders for "buy-in" on the DRRM Plan	Communicators or Message Senders	Audience and Message Users	Communication Media, Channels and Approaches
• Prevention and mitigation action plan, 2020-2022.	• PDRRMC, MDRRMCs, BDRRMCs	• Communities • Students • General Populace • Tourists • Business Sectors	• Social networks • SMS • Radio • Television
• Policies/ ordinance/	• Teachers • PDRRMO	• PDRRMC, PDC, B-	• Barangay assemblies

Key Messages to be Communicated to Stakeholders for "buy-in" on the DRRM Plan	Communicators or Message Senders	Audience and Message Users	Communication Media, Channels and Approaches
resolutions • Habang may buhay may pag-asa. • Be PREPARED! "LAGING HANDA" • "PANGANDAM KALUWASAN MATAGAMTAM"	to lead in cascading the plan to the local level. • PDRRMC Council	LGU, LFC, SP, Stakeholders, Partners • Communities MLGU/BLGU/ Purok, Schools & other stakeholders.	• Tarps • Posters • Sunday church bulletins • Newspaper • Magazines • Leaflets / brochure dissemination • Download thru Provincial website. • EDCOM to publish in local capitol bulletin. • Radio broadcast (Kita ug ang Gobernador, DYRD, kapihan sa PIA) • Radio plugging, local newspapers, IEC materials, billboards, tarpaulin.

*Source: *Office of Civil Defense (OCD)-Bohol and the rest -Mines and Geosciences Bureau – Region 7*

Annex A

Matrix for Past Rainfall-Induced Landslide Events

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
July 31, 2011 Localized landslide in old limestone quarry	Brgy. Lincod, Maribojoc, Bohol (N9^{0}43'42.0", E123^{0}52'17.8")	1 family and 6 persons affected 2 dead, 4 injured; P600,000.00 damaged private and commercial properties
March 16, 2011 @ 3:30 p.m. Landslide/Slope failure, underlain by porous, cavernous, coralline limestone	Sitio Ilaya, Brgy. Bugang Sur, Bilar, Bohol; 1 partially damaged house	Damaged road but no available data on cost
March 2011 Landslide/Slope failure	Brgy. Can-ipol, Jagna, Bohol	Damaged road but no available data on cost
March 2011 Localized Slope failure underlain by weathered mudstone & limestone	So. Katiwian, Brgy. Calabacita, Jagna, Bohol	Damaged road but no available data on cost
March 2011 Road Slip/Subsidence, tension cracks along 200-m road length	Purok Caimito, Brgy. Cawayanan, Tubigon, Bohol	Damaged road but no available data on cost
March 2011 Landslide/Rockfall/Wedge failure, underlain by highly fractured/heavily jointed volcanic rocks	Tagbilaran North Road Km 102.000 Brgy. Burgos, Talibon, Bohol	Damaged road but no available data on cost
March 2011 Slump/Landslide, underlain by weathered agglomerate	Sitio Mabca, Brgy. Overland, Buenavista, Bohol	Damaged road but no available data on cost
March 2011 Landslide	Brgy. Libertad, Tubigon, Bohol	Damaged road but no available data on cost
March 2011 Landslide/Localized Slope failure, underlain by moderately weathered limestone	Km 82 Brgy. Lataban and So. Danao, Brgy. Magsaysay, Sierra Bullones, Bohol	Damaged road but no available data on cost
June 3, 2008 Minor Landslide	Brgy. Sagasa, Balilihan, Bohol	No available data
March 17, 2008 Landslide	Loboc, Bohol	No available data

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
Early March 2008 Landslide/Road Slip, underlain by shales interbedded with sandstone	Loboc-Carmen Road in Brgy. Gotozon, Loboc, Bohol (N9039'03.50", E124^{0}01'39.70")	Damaged road but no available data on cost
February 18, 2008 Landslide/Road Slip, recurred in early 2011/ steep slope cut in the '70's, underlain by limestone	National Highway in Poblacion Central (Liloan) Cortes, Bohol (N9^{0}43'18.60", E123^{0}52'28.20")	Damaged road but no available data on cost
January 11, 2007 Minor Landslide	Loboc-Sikatuna, Bohol	No available data
September 13, 2006 Landslide	Mayana, Jagna, Bohol	No available data
August 23, 2006 Landslide	Mayana, Jagna, Bohol	No available data
March 20, 2006 Landslide	Mayana, Jagna, Bohol	No available data
March 6, 2006 Landcracks	Sierra Bullones, Bohol	No available data
March 2, 2006 Landcracks	Cortes, Bohol	No available data
February 27, 2006 Landcracks	Alicia, Bohol	No available data
December 16, 2005 Landslide underlain by tuffaceous sediments	Brgy. Imelda, Duero, Bohol (N9^{0}45'19.7", 9^{0}45'31.2", E124^{0}22'46.5", 124^{0}23'51.0") 1 family and 5 persons affected	1 house damaged; No available data on damage cost
October 15, 2005 Landslide/ Rotational Slip after heavy rainfall; underlain by limestone	So. Ilaya, Brgy. Labogon, Duero, Bohol (N9^{0}44'44.4", 9^{0}45'00", E124^{0}23'03.6", E124^{0}25'13")	No available data
July 11, 2005 Landslide	Mayana, Jagna, Bohol	P5M - damaged houses P4.5M – infrastructure P5.3M – agriculture Total damages – P14.8M
1980's/ July 11, 2005 Landslide/Rockfall, underlain by shale, tuffaceous siltstone and tuffaceous sandstone, with possible presence of a fault	Brgy. Mayana, Jagna, Bohol (N9^{0}43'55.5", E124^{0}20'56.1") More or less 255 persons affected	Damaged road and 51 residences but no available data on cost
November 2001	Brgy. Candasog, Loboc,	No available data

DESCRIPTION	POPULATION/AREAS AFFECTED	IMPACTS
Landslide/ Rotational Slip	Bohol ($N9^{0}38'50.0"$, $E124^{0}02'25.1"$) 15 has.	
November 22, 1998 Debris/ Rock fall underlain by highly fractured & brecciated ultramatics, clastics and limestone	Tagbilaran-Guindulman Road, Bohol; 20 hectares; 30 families and more or less 150 persons affected	No available data
1070's/ July 1997 Landslide/rockfall/wedge failure/slope failure	DWRP/Angilan River, Duero, Bohol; 50 hectares	No available data

Annex B

Summary of Rainfall-Induced Landslide Susceptibility in Bohol

Municipality	High		Moderate		Low	
	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)
Alburquerque	1	1,467,095	4	3,396,862	11	18,840,460
Alicia	8	22,514,498	15	27,528,545	13	43,555,285
Anda	15	23,708,747	13	13,054,693	0	0
Antequera	0	0	12	17,019,805	20	33,037,297
Baclayon	0	0	12	18,167,373	11	7,900,230
Balilihan	3	1,054,966	22	39,141,677	31	81,323,007
Batuan	0	0	13	45,546,907	15	31,025,717
Bien Unido	0	0	0	0	7	2,586,672
Bilar	0	0	18	94,812,953	17	23,664,873
Buenavista	8	1,996,176	13	12,774,117	25	72,768,460
Calape	9	8,787,785	9	7,948,401	18	23,284,257
Candijay	13	16,937,247	17	20,621,433	17	15,720,233
Carmen	9	14,846,425	23	57,456,658	29	97,565,508
Catigbian	9	3,709,200	16	30,231,695	20	38,439,362
Clarin	2	928,878	6	3,051,958	22	32,337,400
Corella	0	0	5	16,963,839	8	20,554,599
Cortes	0	0	0	0	14	25,035,051
Dagohoy	2	1,225,878	7	21,205,591	14	42,471,552
Danao	12	24,333,738	15	56,541,908	15	55,392,127
Dauis	0	0	5	635,194	0	0
Dimiao	4	611,318	20	28351083	32	24,038,584
Duero	13	18,564,280	19	28,173,474	6	20,608,387
GHernandez	21	18,028,674	27	61,122,343	20	15,790,368
Getafe	2	340,792	6	14,565,467	14	51,318,364
Guindulman	14	34,880,127	13	31,260,000	13	11,470,434
Inabanga	9	5,183,626	21	26,639,192	30	18,027,733
Jagna	25	25,944,747	31	55,339,371	16	15,991,023
Lila	6	4,127,844	15	19,765,183	7	4,008,565
Loay	2	238,172	7	4,205,817	16	13,472,906
Loboc	8	2,742,857	21	31,446,898	25	18,457,576
Loon	19	15,746,036	27	18,618,690	35	36,720,320

Municipality	High		Moderate		Low	
	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)
Mabini	18	16,580,034	20	14,739,356	16	24,021,579
Maribojoc	8	16,023,736	8	6,376,459	15	18,136,374
Pilar	9	10,937,063	12	20,198,807	20	75,692,497
Pres. Garcia	0	0	0	0	20	17,495,289
Sagbayan	6	1,818,715	11	10,412,270	18	24,592,197
San Isidro	1	60,444	10	15,539,372	12	38,108,871
San Miguel	3	1,944,151	5	6,239,812	17	63,744,345
Sevilla	0	0	7	22,720,038	13	41,925,676
Sierra Bullones	12	6,065,677	17	24,883,581	22	45,029,349
Sikatuna	2	2,825,537	6	5,470,049	9	9,767,845
Tagbilaran City	0	0	2	733,829	12	17,298,159
Talibon	0	0	7	20,606,090	23	67,941,114
Trinidad	0	0	4	13,442,904	13	37,035,058
Tubigon	1	691,063	8	6,022,812	20	32,275,358
Ubay	5	18,466,171	6	8,868,368	30	52,117,300
Valencia	19	9,735,765	31	41,520,233	31	36,076,030
TOTAL	**298**	**333,067,462**	**586**	**1,023,361,107**	**812**	**1,496,663,391**

Annex C

Summary for Storm Surge/Big Waves Susceptibility

Municipality	No. of Barangay	Total Land Area (sq. m.)
Alburquerque	6	291,729
Anda	8	1,374,400
Baclayon	5	1,674,550
Bien Unido	14	4,024,686
Buenavista	4	142,768
Calape	14	1,170,617
Candijay	4	1,753,119
Clarin	6	266,912
Cortes	2	277,492
Dauis	5	26,788
Dimiao	8	99,534
Duero	9	336,343
G-Hernandez	11	383,157
Getafe	19	14,593,415
Guindulman	7	542,374
Inabanga	15	1,132,530
Jagna	13	398,066
Lila	10	393,233
Loay	13	680,983
Loon	26	1,088,480
Mabini	15	3,991,375
Maribojoc	9	883,488
Panglao	8	2,341,532
Pres. Garcia	21	4,092,553
Tagbilaran City	5	138,244
Talibon	17	11,812,330
Tubigon	14	633,596
Ubay	20	4,408,879
Valencia	8	234,231
TOTAL	316	59,187,404

Annex D

Summary for Earthquake Susceptibility

Municipality	Susceptibility Level			
	Intensity 7		Intensity 8	
	Barangay	Land Area (sq.m.)	Barangay	Land Area (sq.m.)
Alburquerque	0	0	11	26,363,037
Alicia	0	0	15	118,335,078
Anda	0	0	16	50,352,615
Antequera	15	24,866,419	15	29,964,269
Baclayon	0	0	17	31,713,811
Balilihan	9	6,157,300	31	119,741,019
Batuan	0	0	15	91,281,433
Bien Unido	13	23,101,895	2	3,508,681
Bilar	0	0	19	134,951,293
Buenavista	15	67,123,687	24	34,016,623
Calape	33	72,457,438	1	25,366
Candijay	0	0	21	93,105,632
Carmen	3	6,583,395	29	213,661,109
Catigbian	18	29,064,007	18	54,567,757
Clarin	18	37,562,022	18	14,856,951
Corella	0	0	8	38,897,600
Cortes	0	0	14	30,071,089
Dagohoy	1	446,576	15	73,252,428
Danao	16	88,452,260	13	55,673,469
Dauis	5	4,154,139	12	41,207,256
Dimiao	0	0	35	55,289,585
Duero	0	0	21	74,896,568
G-Hernandez	0	0	30	99,851,224
Getafe	3	27,517,032	24	68,482,136
Guindulman	0	0	19	101,428,262
Inabanga	20	32,837,220	40	67,876,210
Jagna	0	0	33	105,752,345
Lila	0	0	18	33,350,442
Loay	0	0	24	29,557,344
Loboc	0	0	28	57,331,014
Loon	67	97,036,882	1	452
Mabini	22	86,898,747	22	86,898,747
Maribojoc	12	26,971,346	16	25,889,135
Panglao	2	370,811	10	47,394,290
Pilar	0	0	21	121,179,717
Pres. Garcia	23	43,873,441	5	1,753,528
Sagbayan	19	60,020,017	15	33,410,205

Municipality	Susceptibility Level			
	Intensity 7		Intensity 8	
	Barangay	Land Area (sq.m.)	Barangay	Land Area (sq.m.)
San Isidro	12	53,139,434	3	6,429,688
San Miguel	4	7,231,765	18	107,238,612
Sevilla	0	0	13	66,822,158
Sierra Bullones	0	0	22	85,536,843
Sikatuna	0	0	10	20,895,668
Tagbilaran City	0	0	15	29,336,707
Talibon	21	110,386,546	12	24,218,837
Trinidad	6	36,300,744	20	80,045,239
Tubigon	23	46,385,787	19	14,309,698
Ubay	1	555,425	44	227,923,368
Valencia	0	0	35	94,094,544
TOTAL	381	989,494,335	887	3,022,739,082

Annex E

Summary for Earthquake-Induced Landslide Susceptibility

Municipality	Susceptibility Levels					
	High		Moderate		Low	
	No. of Barangay	Land Area (sq.m.)	No. of Barangay	Land Area (sq.m.)	No. of Barangay	Land Area (sq.m.)
Alburquerque	5	23,334	10	848,886	11	2,429,444
Alicia	7	63,089	15	3,537,428	15	8,279,021
Anda	0	0	15	618,817	15	5,238,640
Antequera	0	0	21	561,776	21	5,016,953
Baclayon	2	808	9	456,091	13	2,643,130
Balilihan	6	53,219	30	5,292,219	31	18,123,129
Batuan	8	67,663	15	7,570,349	15	19,401,609
Bilar	18	1,598,134	18	15,491,435	19	27,047,249
Buenavista	0	0	15	83,281	23	4,204,381
Calape	0	0	15	394,470	18	5,230,686
Candijay	6	28671	20	2,280,024	20	7,574,727
Carmen	4	667,911	26	4,788,782	29	14,853,761
Catigbian	2	2,009	17	1,360,527	21	7,336,280
Clarin	0	0	10	95594	18	1,763,915
Corella	1	1,179	7	816,122	8	3,653,257
Cortes	0	0	9	116,888	14	654588
Dagohoy	1	8,032	10	1,041,130	14	5,067,418
Danao	2	4,914	14	1,565,781	17	12,898,827
Dauis	0	0	2	5,919	4	125,403
Dimiao	19	204,597	30	3,423,317	35	3,230,031
Duero	9	77,402	20	4,605,047	21	9,661,484
G-Hernandez	15	415,368	30	6,197,753	30	12,779,230
Getafe	0	0	4	65,338	11	2,708,909
Guindulman	5	115,586	15	5,189,652	17	12,403,464
Inabanga	0	0	18	126594	28	3,674,513
Jagna	8	146,480	32	5,271,279	33	12,188,800
Lila	13	807,982	18	2,297,851	18	3,636,209
Loay	8	74,312	16	1,119,458	22	1,737,722
Loboc	22	725,685	28	5,068,279	28	8,313,832
Loon	0	0	31	363,684	52	7,359,600
Mabini	0	0	19	763,655	21	4,705,441
Maribojoc	0	0	11	281,738	17	3414704
Panglao	0	0	1	3,997	1	39,406

Municipality	Susceptibility Levels					
	High		Moderate		Low	
	No. of Barang	Land Area (sq.m.)	No. of Barang	Land Area (sq.m.)	No. of Baranga	Land Area (sq.m.)
Pilar	7	177,593	19	2,362,107	21	4,129,137
Pres. Garcia	0	0	3	3,602	17	292,853
Sagbayan	0	0	22	684,339	24	4,021,605
San Isidro	1	393	12	1,150,989	12	7,946,250
San Miguel	0	0	8	115,897	11	1,719,710
Sevilla	6	97,021	13	4,389,039	13	11,885,370
Sierra Bullones	15	428,626	19	2,863,919	22	4,292,093
Sikatuna	3	4,629	10	994,371	10	2,842,434
Tagbilaran City	0	0	6	38,746	8	194,467
Talibon	0	0	4	83,117	10	3,315,254
Trinidad	0	0	3	155,993	7	3,016,726
Tubigon	0	0	16	177,127	19	3,028,484
Ubay	0	0	13	822,881	19	4,699,798
Valencia	22	768,748	34	6,847,956	35	9,747,827
TOTAL	215	6,563,385	733	102,393,244	887	298,527,771

Annex F

Summary Matrix for Hazard Susceptibility

Municipality	Geologic Hazards				Hydro-meteorologic Hazards			
	EQ	Liquefaction	EIL	Tsunami	Floods	RIL	SS	Others
Alburquerque								
Alicia								
Anda								
Antequera								
Baclayon								
Balilihan								
Batuan								
Bien Unido								
Bilar								
Buenavista								
Calape								
Candijay								
Carmen								
Catigbian								
Clarin								
Corella								
Cortes								
Dagohoy								
Danao								
Dauis								
Dimiao								
Duero								
G-Hernandez								
Getafe								
Guindulman								
Inabanga								
Jagna								
Lila								
Loay								
Loboc								
Loon								
Mabini								
Maribojoc								
Panglao								
Pilar								
Pres. Garcia								
Sagbayan								
San Isidro								
San Miguel								
Sevilla								
Sierra Bullones								
Sikatuna								
Tagbilaran								

Municipality	Geologic Hazards				Hydro-meteorologic Hazards			
	EQ	Liquefaction	EIL	Tsunami	Floods	RIL	SS	Others
City								
Talibon								
Trinidad								
Tubigon								
Ubay								
Valencia								

Annex G

Approved Contingency Plan

1. EXECUTIVE SUMMARY

This Provincial Disaster Risk Reduction and Management (PDRRM) - Contingency Plan (CP) includes the 47 municipalities and one city in the Province of Bohol. It covers all types of unforeseen events – natural disasters, anthropogenic climate-change impacts, and man-made incidents.

Formulation of the PDRRM Plan started when R.A. 10121 or the Philippine Disaster Risk Reduction and Management (PDRRM) Act of 2010 was passed. The PDRRM Council's leadership was tested on October 15, 2013, when a 7.2-magnitude earthquake struck Bohol. After establishing the Command Center, the PDRRMC held weekly meetings to fine tune the PDRRM Plan and come up with a Contingency Plan. With support from international organizations and national government agencies, the Provincial Government of Bohol (PGBh), through the PDRRMC, addressed emergency needs of affected populations and started implementation of early recovery interventions.

Through a joint effort of various offices of the Provincial Government, the Post-Great Bohol Earthquake Rehabilitation (PGBER) Plan was prepared, with assistance from national government agencies, the civil society and the business sector. Parts of this PDRRM-CP were lifted from the PGBER Plan, particularly on the Disaster Emergency Response; Early Recovery Efforts; and Full Rehabilitation Plan. Some parts of the Post-Great Bohol Earthquake Transition Plan, the preparation of which was initiated by the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA), were also adopted in this Plan.

This Plan is organized into possible scenarios and planning assumptions; objectives and strategies; management and coordination arrangements; actions on activation; plan for implementation, operational support and preparedness with corresponding budget. The scenarios on natural disasters and anthropogenic climate change impacts of this plan were taken from the Bohol Hazard Profile that was prepared by the Provincial Planning and Development Office (PPDO) Technical Team in 2011, with assistance from the National Economic Development Authority (NEDA). Scenarios on man-made incidents are subject to public consultation for further refinement.

The section on 'Management and Coordination Arrangements' defines in detail the overall management and coordination arrangements in responding to an emergency, including the

responsibilities of each stakeholder. On the other hand, the section on 'Actions on Activation' describes the actions to be taken if the Contingency Plan is activated, including preparedness actions, a timeline of actions, assessment arrangements and a summary of response plans by cluster per sector. Considered as a 'living document', the Contingency Plan will be reviewed for updating by the PDRRMC every quarter, if need be.

2. INTRODUCTION

Bohol is one of the pilot provinces fortunately chosen by the National Economic Development Authority (NEDA) to be a project recipient in mainstreaming Disaster Risk Reduction (DRR) and Climate Change Adaptation (CCA) into the enhanced Provincial Development and Physical Framework Plan (PDPFP). Right after the twin tragedies of the earthquake and super typhoon Yolanda in 2013, the current leadership realized the need to develop a Contingency Plan that will address the humanitarian needs of those adversely affected by crises. Contingency is an event that may possibly occur but is not likely or intended. This Plan aims to prepare Bohol as a disaster-resilient and climate-smart province.

The Provincial Disaster Risk Reduction and Management Council (PDRRMC) of Bohol continuously collaborate with the Philippine Institute of Volcanology and Seismology (PHIVOLCS) and the Office of Civil Defense (OCD) to ensure its readiness to address emergency needs. The Multi-Geo-Hazard Maps of Bohol was the 1st-component implemented in February 2007, which was developed through the Hazard Mapping and Assessment for Effective Community-Based Disaster Risk Management (READY) Project, a collaborative effort of the National Government, the United Nations Development Program (UNDP) and the Australian Agency for International Development (AusAID). As a continuing undertaking, the READY project's 3rd component, which is the Rapid Earthquake Damage Assessment System (REDAS), was conducted in the 47 municipalities and the City of Tagbilaran in Bohol. The REDAS was developed by the PHIVOLCS-DOST for emergency preparedness and, more importantly, for land use planning.

In 2011, the Bohol Hazard Profile was prepared, using the NEDA-recommended disaster risk assessment processes: hazard characterization and frequency analysis, consequence analysis, risk estimation, and risk prioritization. The Hazard Profile was referenced in preparing this PDRRM-Contingency Plan, using currently available data and information sets including hazard maps that identify areas susceptible to a particular hazard. The maps were provided by the PHIVOLCS, Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAG-ASA) and Mines and Geosciences Bureau (MGB).

The 7.2-magnitude earthquake tested the provincial leadership's capacity for emergency response through rescue and relief operations. The Post-Great Bohol Earthquake Rehabilitation Plan, prepared in December 2013, recorded the efforts of the Provincial Government of Bohol (PGBh) from the early recovery phase to the plan for full recovery and rehabilitation to set communities on a better and safer development path and to facilitate resilient recovery. After five months of joint recovery work, the PGBh and partner organizations, with support from the United Nations Office for the Coordination of Humanitarian Affairs (UN-OCHA), came up with the Post-Great Bohol Earthquake Transition Plan in March 2013 to ensure that interventions are continued even after the international organizations have pulled out of the province.

3. SCENARIOS and PLANNING ASSUMPTIONS

3.1 Current Situation

Bohol is the 10th largest island of the archipelago and one of four provinces of Region VII, the Central Visayas Region. Classified First Class province by the Department of Finance, Bohol has 47 municipalities (30 coastal and 17 inland) and one component city that serves as the provincial capital and primary gateway of Bohol. The municipalities are grouped into three congressional districts with a total of 1,109 barangays and a population of 1.255 million Boholanos based on the NSO 2010 census.

Being an island province, Bohol is one of the seismically active areas in the country and is, therefore, vulnerable to natural disasters. It is prone to earthquake and its related hazards like ground shaking, liquefaction, earthquake-induced landslide and tsunami because of the presence of two faults in Bohol as well as faults located in Cebu, Negros and Leyte. The southernmost part of the province experienced frequent ground shaking due to the presence of the East Bohol Fault and another fault within the sea on the southern part. The New Bohol Fault (NBF) was lately discovered in the municipality of Inabanga after an earthquake shook the province in 2013. Instrumental monitoring of earthquakes for the past century has detected many small to moderate-magnitude earthquakes in Bohol Island.

The 7.2-magnitude earthquake, which that struck Bohol and nearby provinces, was described by Dr. Art Daag of PHIVOLCS as “an earthquake with energy equivalent to “32 Hiroshima bombs”. A “ground rupture” pushed up a stretch of ground, creating a wall of rock above the epicenter. The other quake's impacts are ground shaking and liquefaction. Several sinkholes also appeared after the earthquake. The earthquake caused widespread damage to roads, bridges, houses, churches and even icons of Boholano culture and heritage. Historic churches dating from the Spanish colonial period suffered the most. Per NDRRMC Report, there were 209 casualties, 877 injured, 71,767 displaced families (348,234 persons), while lost properties were estimated at a total of P7.862 billion. An integrated multi-sectoral approach was used by the PDRRMC in delivering early recovery interventions, focusing on the specific needs of key affected areas. Problems, needs, resources, capacities and development potentials available at the local level were identified.

Among the areas in the Philippines threatened by drastic effects of global warming, Bohol was ranked as the 9th of the top 20 provinces vulnerable to a one-meter sea level rise (source: Climate Hotspot, Climate Change Impacts in the Philippines conducted by the Greenpeace Southeast Asia, Climate and Energy Campaign in 2007). Due to its topography and presence of eleven major rivers, the province is also prone to hydrometeorological hazards such as floods, rainfall-induced landslides and storm surges. As such, the province has been incurring significant economic and environmental damages from natural and man-made disasters. Notable calamities that hit the province include earthquakes, flashfloods in Clarin, Tubigon, Loon and Calape; landslides in Balilihan, Loboc, Alicia, Cortes, Jagna, Sierra Bullones; severe rains in Getafe and typhoons “Frank” and “Lando” that left significant damage to Bohol’s agricultural assets. Man-made calamities were also recorded during the period ranging from fire incidents, diarrhea outbreak and sea mishaps.

3.2 Scenario A: Natural Disasters (Hydrometeorological and Geological Hazards)

A **scenario** is an account or synopsis of a possible course of events that could occur, which forms the basis for planning assumptions while a **hazard** is a potentially damaging physical event, phenomenon or human activity that may cause the loss of life or injury, property damage, social and economic

disruption or environmental degradation (ISDR). The natural hazards considered in this PDRRM-Contingency Plan pertain to events arising from geologic and hydrometeorologic processes that have the potential of causing deaths, injuries and damage to property. **Hydrometeorological hazards** are natural processes or phenomena of atmospheric, hydrologic or oceanographic nature, which include fluvial hazards and coastal hazards. Fluvial hazards include flooding, scouring of riverbeds, channel/rill/gully erosion, channel migration, and sedimentation. Coastal hazards include flooding, coastal erosion, coastal aggradation, storm surge, coastal subsidence/sea level rise, and submarine landslide. Other hydrometeorological hazards are tropical cyclones, thunder/hailstorms, rain and windstorms, blizzards and other severe storms; drought, desertification, wildland fires, and temperature extremes. Only three of these hazards are covered by the PDRRM-Contingency Plan, i.e., floods, rain-induced landslides and storm surges.

On the other hand, **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.

3.2.1 Scenario A.1: Hydrometeorological Hazards - Flooding

A **flood** is an overflow of an expanse of water that submerges land. It is a temporary covering by water of land not normally covered by water. In the sense of "flowing water", this also applies to the inflow of the tide. Flooding may result from the volume of water within a body of water, such as a river or lake which overflows or breaks levees, with the result that some of the water escapes its usual boundaries. Floods can also occur in rivers, when flow exceeds the capacity of the river channel, particularly at bends or meanders.

The province of Bohol is frequently affected by flashflood during the typhoon and the monsoon season.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, 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 that contributes to the occurrence of this hazard 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 areas.

Based on the data generated by the MGB-7, the municipalities susceptible to high flooding are Jagna, Inabanga, Danao and Dagohoy with flood-prone areas that are more than 300 hectares. Municipalities susceptible to moderate flooding are Antequera, Carmen, Guindulman, Loay and Valencia while other municipalities susceptible to low flooding are Balilihan, Candijay, Cortes, Duero, Loboc, Maribojoc, Pilar, San Isidro and Sierra Bullones. In terms of the number of barangay susceptible to floods and flashfloods, Inabanga has the highest number of barangays (21 barangays). The total area prone to high flooding is 31,628.33 hectares or approximately eight (8) percent of the total area of Bohol (see Table 1 below).

The Flood Control Map (Annex B - Figure 1) shows that the flood path is situated in Inabanga-Danao-Dagohoy area, San Isidro-Antequera area, Maribojoc, Loboc-Loay area, Valencia, Jagna, Duero, Guindulman, and Candijay. There are proposed flood control points in Sierra Bullones, Alicia,

Guindulman, Duero, Jagna, Lila and Loboc. Table 2 in Annex A shows the more detailed matrix of areas susceptible to flooding in Bohol Province.

Table 1. Summary for Flood Susceptibility in Bohol

Municipality	No. of Barangays	Areas (sq.m.)
Antequera	4	1,149,389
Balilihan	6	808,708
Candijay	3	487,708
Carmen	1	1,050,704
Cortes	3	876,376
Dagohoy	11	7,093,107
Danao	11	5,256,015
Duero	2	102,855
Guindulman	3	1,005,277
Inabanga	21	4,157,017
Jagna	13	3,072,594
Loay	7	2,221,561
Loboc	5	627,484
Maribojoc	5	473,064
Pilar	2	128,826
San Isidro	3	907,498
Sierra Bullones	1	575,436
Valencia	11	1,634,712
	112	**31,628,331**

3.2.2 Scenario A.2: Hydrometeorological Hazards - Rainfall-Induced Landslides

A **landslide** or **landslip** is a geological phenomenon which includes a wide range of ground movement, such as rockfalls, deep failure of slopes and shallow debris flows, which can occur in offshore, coastal and onshore environments. Although the action of gravity is the primary driving force for a landslide to occur, there are other contributing factors affecting the original slope stability.

Based from the Rainfall-Induced Landslide (RIL) Hazard Map generated by the MGB-Region 7 (Figure 2 in Annex B), the municipalities susceptible to high rain-induced landslides are: Alicia, Bilar, Buenavista, Cortes, Duero, Jagna, Loboc, Maribojoc, Sierra Bullones, and Tubigon. However, data obtained by the Provincial Planning and Development Office (PPDO) of Bohol shows that Balilihan, Guindulman, Sikatuna and Talibon are also prone to rain-induced landslides.

Of the 47 towns and 1 city, only Panglao is not susceptible to rainfall-induced landslide (RIL) owing to its plain topography and the absence of mountains or hills. Loon has the the most number of barangays (35) with low susceptibility to RIL. While Jagna has the highest number of barangays (25) with high susceptibility to RIL, it shares with Valencia in having the most number of barangays (31) with moderate susceptibility to RIL. All in all, there are 9,735,765 (0.2364%) square meters of Bohol's land area that has a high susceptibility to rainfall-induced landslides while 41,520,233 (1.0084%) sq. m. are moderately susceptible and 559,099,088 (13.5793%) sq. m. have low

susceptibility. With respect to the total land area of Bohol, 0.2364% is highly susceptible, 1.0084% moderately susceptible and 13.5793% is with low RIL susceptibility.

Table 3. Summary for Level of Susceptibility to Rainfall-Induced Landslide in Bohol

Province of Bohol	High		Moderate		Low	
Municipality	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)
Alburquerque	1	1,467,095	4	3,396,862	11	18,840,460
Alicia	8	22,514,498	15	27,528,545	13	43,555,285
Anda	15	23,708,747	13	13,054,693	0	0
Antequera	0	0	12	17,019,805	20	33,037,297
Baclayon	0	0	12	18,167,373	11	7,900,230
Balilihan	3	1,054,966	22	39,141,677	31	81,323,007
Batuan	0	0	13	45,546,907	15	31,025,717
Bien Unido	0	0	0	0	7	2,586,672
Bilar	0	0	18	94,812,953	17	23,664,873
Buenavista	8	1,996,176	13	12,774,117	25	72,768,460
Calape	9	8,787,785	9	7,948,401	18	23,284,257
Candijay	13	16,937,247	17	20,621,433	17	15,720,233
Carmen	9	14,846,425	23	57,456,658	29	97,565,508
Catigbian	9	3,709,200	16	30,231,695	20	38,439,362
Clarin	2	928,878	6	3,051,958	22	32,337,400
Corella	0	0	5	16,963,839	8	20,554,599
Cortes	0	0	0	0	14	25,035,051
Dagohoy	2	1,225,878	7	21,205,591	14	42,471,552
Danao	12	24,333,738	15	56,541,908	15	55,392,127
Dauis	0	0	5	635,194	0	0
Dimiao	4	611,318	20	28351083	32	24,038,584
Duero	13	18,564,280	19	28,173,474	6	20,608,387
GHernandez	21	18,028,674	27	61,122,343	20	15,790,368
Getafe	2	340,792	6	14,565,467	14	51,318,364
Guindulman	14	34,880,127	13	31,260,000	13	11,470,434
Inabanga	9	5,183,626	21	26,639,192	30	18,027,733
Jagna	25	25,944,747	31	55,339,371	16	15,991,023
Lila	6	4,127,844	15	19,765,183	7	4,008,565
Loay	2	238,172	7	4,205,817	16	13,472,906
Loboc	8	2,742,857	21	31,446,898	25	18,457,576
Loon	19	15,746,036	27	18,618,690	35	36,720,320
Mabini	18	16,580,034	20	14,739,356	16	24,021,579
Maribojoc	8	16,023,736	8	6,376,459	15	18,136,374

Province of Bohol	High		Moderate		Low	
Municipality	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)	No. of Barangay	Land Area (m^2.)
Pilar	9	10,937,063	12	20,198,807	20	75,692,497
Pres. Garcia	0	0	0	0	20	17,495,289
Sagbayan	6	1,818,715	11	10,412,270	18	24,592,197
San Isidro	1	60,444	10	15,539,372	12	38,108,871
San Miguel	3	1,944,151	5	6,239,812	17	63,744,345
Sevilla	0	0	7	22,720,038	13	41,925,676
Sierra Bullones	12	6,065,677	17	24,883,581	22	45,029,349
Sikatuna	2	2,825,537	6	5,470,049	9	9,767,845
Tagbilaran City	0	0	2	733,829	12	17,298,159
Talibon	0	0	7	20,606,090	23	67,941,114
Trinidad	0	0	4	13,442,904	13	37,035,058
Tubigon	1	691,063	8	6,022,812	20	32,275,358
Ubay	5	18,466,171	6	8,868,368	30	52,117,300
Valencia	19	9,735,765	31	41,520,233	31	36,076,030
TOTAL	**298**	**333,067,462**	**586**	**1,023,361,107**	**812**	**1,496,663,391**

There is a total of 298 barangays (33,306.7462 has.) in the province that is highly susceptible to rainfall-induced landslide while 586 (102,336.1107 has.) barangays are moderately susceptible and 812 barangays (149,666.3391 has.) have low susceptibility to RIL. In summary, about 8.09% of Bohol's total land area is highly susceptible, 24.86% is moderately susceptible and 36.35% has low susceptibility to RIL. About 30% of the province's area is not susceptible to RIL. Table 4 in Annex A shows a more detailed matrix for level of susceptibility to rainfall-induced landslide in Bohol.

3.2.3 Scenario A.3: Hydrometeorological Hazards – Storm Surges

A **storm surge** is a rise above the usual water level along the shore that is the result of strong onshore winds and/or reduced atmospheric pressure; the actual surge height is the difference of the observed water level minus the predicted tide. Lack of information on the nature and danger of a storm surge may cause untimely death, as what happened to the people in Tacloban City in November 2013 after Super Typhoon Yolanda wrecked Samar and Leyte.

Based on Table 5, Summary Matrix for Storm Surge/Big Waves Susceptibility, there are nineteen municipalities in Bohol that are not susceptible to storm surge, namely: Alicia, Antequera, Balilihan, Batuan, Bilar, Carmen, Catigbian, Corella, Dagohoy, Danao, Loboc, Pilar, Sagbayan, San Isidro, San Miguel, Sevilla, Sierra Bullones, Sikatuna and Trinidad. Getafe has the highest land area (1,459.3415 has.) susceptible to storm surge, followed by Talibon (1,181.2330 has.), Ubay (440.8979 has.), Bien Unido (402.4686 has.), and Mabini (3991.1375 has.). On the other hand, Loon has the most number of barangays (26) susceptible to storm surge, followed by Pres. Garcia (21), Ubay (20), Getafe (19), and Talibon (17). The 28 municipalities and Tagbilaran City covering a total of 316 barangays susceptible to storm surge have a combined land area of 5,918.7404 hectares. This covers around 1.4375% of the total land area of Bohol.

A Storm Surge Hazard Map is found in Annex B (Figure 3) for better visualization of the storm surge-susceptible municipalities while Table 6 (Annex A) shows the detailed matrix for the barangays' level of susceptibility to storm surges/big waves.

Table 5. Summary for Level of Susceptibility to Storm Surge/Big Waves in Bohol

Province of Bohol Municipality	No. of Barangay	Total Land Area (sq. m.)
Alburquerque	6	**291,729**
Anda	8	**1,374,400**
Baclayon	5	**1,674,550**
Bien Unido	14	**4,024,686**
Buenavista	4	**142,768**
Calape	14	**1,170,617**
Candijay	4	**1,753,119**
Clarin	6	**266,912**
Cortes	2	**277,492**
Dauis	5	**26,788**
Dimiao	8	**99,534**
Duero	9	**336,343**
G-Hernandez	11	**383,157**
Getafe	19	**14,593,415**
Guindulman	7	**542,374**
Inabanga	15	**1,132,530**
Jagna	13	**398,066**
Lila	10	**393,233**
Loay	13	**680,983**
Loon	26	**1,088,480**
Mabini	15	**3,991,375**
Maribojoc	9	**883,488**
Panglao	8	**2,341,532**
Pres. Garcia	21	**4,092,553**
Tagbilaran City	5	**138,244**
Talibon	17	**11,812,330**
Tubigon	14	**633,596**
Ubay	20	**4,408,879**
Valencia	8	**234,231**
TOTAL	**316**	**59,187,404**

3.2.4 Scenario A.4: Geological Hazards – Earthquakes

Geological hazards result from geologic processes acting on or beneath the earth's surface. These include movement of plate in the earth's crust or from local concentration of heat and are source of hazards to people and their natural and built-up environment on the earth's surface. These hazards are classified into **earthquakes**, **earthquake-related/ seismic hazards**, **mass movement** (landslides,

creep, subsidence, settlement), and **volcanic hazards** (lava/debris/pyroclastic flow, debris avalanche, lahar, ash fall, tsunami, flooding, volcanic gases and earthquake).

Bohol is prone to geological hazards because of the presence of East Bohol Fault, another fault located in the seas at the southern part of Bohol, and the North Bohol Fault that triggered the 7.2-magnitude earthquake in October 2013. The presence of Negros Trench and PFZ Central Leyte Fault may also contribute to the generation of earthquake in Bohol. PHIVOLCS reported that Bohol experienced an earthquake with a magnitude of 6.9 and depth of 33 km. in February 4, 1941 and a magnitude of 6.5 with a depth of 34 km. in Feb. 8, 1990. Earthquakes have been felt in Bohol but only an average of one perceptible shock is reported each year.

Earthquake is the result of the sudden release of energy in the earth's crust that creates seismic waves. At the earth's surface, earthquakes manifest themselves by shaking and sometimes displacement of the ground. When the epicenter of a large earthquake is located offshore, the seabed may be displaced sufficiently to cause a tsunami. Earthquakes can also trigger landslides, and occasionally volcanic activity.

Figure 4 found in Annex B shows the Ground-Shaking Map while Table 7 shows the summary for level of susceptibility to earthquake of Bohol's municipalities. At one glance on the map, it is quite glaring that about three-fourth of Bohol's total land area is susceptible to Intensity 8 (in red shade) while about one-fourth is prone to Intensity 7 (in pink shade), which runs from Talibon going northwest to Calape, Loon and Maribojoc.

The 381 barangays prone to Intensity 7 have a total land area of 98,949.4335 hectares which is 24.03% of Bohol's total land area. On the other hand, the Intensity 8-prone barangays have a total land area of 302,273.9082 hectares or 73.42% of the total land area of the province.

All of the fifteen barangays of Tagbilaran City are prone to Intensity 8 which may have an adverse effect on the Central Business District should an earthquake with such intensity hit the city.

Table 7. Summary for Level of Susceptibility to Earthquake

Province of Bohol	Earthquake Susceptibility Level			
	Intensity 7		Intensity 8	
Municipality	Barangay	Land Area (m^2)	Barangay	Land Area (m^2)
Alburquerque	0	0	11	26,363,037
Alicia	0	0	15	118,335,078
Anda	0	0	16	50,352,615
Antequera	15	24,866,419	15	29,964,269
Baclayon	0	0	17	31,713,811
Balilihan	9	6,157,300	31	119,741,019
Batuan	0	0	15	91,281,433
Bien Unido	13	23,101,895	2	3,508,681
Bilar	0	0	19	134,951,293
Buenavista	15	67,123,687	24	34,016,623
Calape	33	72,457,438	1	25,366
Candijay	0	0	21	93,105,632
Carmen	3	6,583,395	29	213,661,109
Catigbian	18	29,064,007	18	54,567,757
Clarin	18	37,562,022	18	14,856,951

Province of Bohol	Earthquake Susceptibility Level			
	Intensity 7		Intensity 8	
Municipality	Barangay	Land Area (m^2)	Barangay	Land Area (m^2)
Corella	0	0	8	38,897,600
Cortes	0	0	14	30,071,089
Dagohoy	1	446,576	15	73,252,428
Danao	16	88,452,260	13	55,673,469
Dauis	5	4,154,139	12	41,207,256
Dimiao	0	0	35	55,289,585
Duero	0	0	21	74,896,568
G-Hernandez	0	0	30	99,851,224
Getafe	3	27,517,032	24	68,482,136
Guindulman	0	0	19	101,428,262
Inabanga	20	32,837,220	40	67,876,210
Jagna	0	0	33	105,752,345
Lila	0	0	18	33,350,442
Loay	0	0	24	29,557,344
Loboc	0	0	28	57,331,014
Loon	67	97,036,882	1	452
Mabini	22	86,898,747	22	86,898,747
Maribojoc	12	26,971,346	16	25,889,135
Panglao	2	370,811	10	47,394,290
Pilar	0	0	21	121,179,717
Pres. Garcia	23	43,873,441	5	1,753,528
Sagbayan	19	60,020,017	15	33,410,205
San Isidro	12	53,139,434	3	6,429,688
San Miguel	4	7,231,765	18	107,238,612
Sevilla	0	0	13	66,822,158
Sierra Bullones	0	0	22	85,536,843
Sikatuna	0	0	10	20,895,668
Tagbilaran City	0	0	15	29,336,707
Talibon	21	110,386,546	12	24,218,837
Trinidad	6	36,300,744	20	80,045,239
Tubigon	23	46,385,787	19	14,309,698
Ubay	1	555,425	44	227,923,368
Valencia	0	0	35	94,094,544
TOTAL	**381**	**989,494,335**	**887**	**3,022,739,082**

3.2.5 Scenario A.5: Geological Hazards – Earthquake-Induced/Seismic Hazards

Earthquake-induced or seismic hazards include ground rupture, ground shaking, liquefaction, landslides, and tsunami.

Table 9 shows that Loon municipality has the highest number of barangays (52) with low

susceptibility to earthquake-induced landslide (EIL) and Valencia has the highest number of barangays (34) with moderate susceptibility while both Valencia and Loboc have the highest number of barangays (22) that are highly susceptible to EIL. Figure 5 in Annex B shows the Earthquake-Induced Landslide Hazard Map.

Municipalities with steep slope are susceptible to high exceedance earthquake-induced landslide, namely: Bilar, Carmen, Dimiao, Garcia Hernandez, Jagna, Lila, Loboc, Sierra Bullones and Valencia. The earthquake-induced landslide will be triggered by earthquake generators from East Bohol Fault and Negros Trench.

Table 9. Summary for Level of Susceptibility to Earthquake-Induced Landslide

Province of Bohol Municipality	Earthquake-Induced Landslide Susceptibility Levels					
	High		Moderate		Low	
	No. of Barangay	Land Area (sq.m.)	No. of Barangay	Land Area (sq.m.)	No. of Barangay	Land Area (sq.m.)
Alburquerque	5	23,334	10	848,886	11	2,429,444
Alicia	7	63,089	15	3,537,428	15	8,279,021
Anda	0	0	15	618,817	15	5,238,640
Antequera	0	0	21	561,776	21	5,016,953
Baclayon	2	808	9	456,091	13	2,643,130
Balilihan	6	53,219	30	5,292,219	31	18,123,129
Batuan	8	67,663	15	7,570,349	15	19,401,609
Bilar	18	1,598,134	18	15,491,435	19	27,047,249
Buenavista	0	0	15	83,281	23	4,204,381
Calape	0	0	15	394,470	18	5,230,686
Candijay	6	28671	20	2,280,024	20	7,574,727
Carmen	4	667,911	26	4,788,782	29	14,853,761
Catigbian	2	2,009	17	1,360,527	21	7,336,280
Clarin	0	0	10	95594	18	1,763,915
Corella	1	1,179	7	816,122	8	3,653,257
Cortes	0	0	9	116,888	14	654588
Dagohoy	1	8,032	10	1,041,130	14	5,067,418
Danao	2	4,914	14	1,565,781	17	12,898,827
Dauis	0	0	2	5,919	4	125,403
Dimiao	19	204,597	30	3,423,317	35	3,230,031
Duero	9	77,402	20	4,605,047	21	9,661,484
G-Hernandez	15	415,368	30	6,197,753	30	12,779,230
Getafe	0	0	4	65,338	11	2,708,909
Guindulman	5	115,586	15	5,189,652	17	12,403,464
Inabanga	0	0	18	126594	28	3,674,513
Jagna	8	146,480	32	5,271,279	33	12,188,800
Lila	13	807,982	18	2,297,851	18	3,636,209
Loay	8	74,312	16	1,119,458	22	1,737,722
Loboc	22	725,685	28	5,068,279	28	8,313,832
Loon	0	0	31	363,684	52	7,359,600
Mabini	0	0	19	763,655	21	4,705,441
Maribojoc	0	0	11	281,738	17	3414704
Panglao	0	0	1	3,997	1	39,406

Province of Bohol	Earthquake-Induced Landslide Susceptibility Levels					
	High		Moderate		Low	
Municipality	No. of Barangay	Land Area (sq.m.)	No. of Barangay	Land Area (sq.m.)	No. of Barangay	Land Area (sq.m.)
Pilar	7	177,593	19	2,362,107	21	4,129,137
Pres. Garcia	0	0	3	3,602	17	292,853
Sagbayan	0	0	22	684,339	24	4,021,605
San Isidro	1	393	12	1,150,989	12	7,946,250
San Miguel	0	0	8	115,897	11	1,719,710
Sevilla	6	97,021	13	4,389,039	13	11,885,370
Sierra Bullones	15	428,626	19	2,863,919	22	4,292,093
Sikatuna	3	4,629	10	994,371	10	2,842,434
Tagbilaran City	0	0	6	38,746	8	194,467
Talibon	0	0	4	83,117	10	3,315,254
Trinidad	0	0	3	155,993	7	3,016,726
Tubigon	0	0	16	177,127	19	3,028,484
Ubay	0	0	13	822,881	19	4,699,798
Valencia	22	768,748	34	6,847,956	35	9,747,827
TOTAL	**215**	**6,563,385**	**733**	**102,393,244**	**887**	**298,527,771**

Table 10 in Annex A shows the detailed matrix for level of susceptibility to earthquake-Induced landslide. Meanwhile, the Liquefaction Hazard Map (Figure 6 in Annex B) was based on the geology, presence of active faults, historical accounts of liquefaction, geomorphology and hydrology of the area, and preliminary microtremor survey data used to validate type of underlying materials. This map is semi-detailed and may be used for land use, emergency response and mitigation planning, and should not be used for site-specific evaluation. The liquefaction hazard map does not restrict construction of any structures and development in areas susceptible to liquefaction as long as proper engineering considerations are applied.

Based on the liquefaction map, all coastal municipalities are susceptible to high exceedance liquefaction including all island barangays of Bohol. The moderately susceptible areas are some barangays located in the different municipalities of Ubay, Bien Unido, Getafe, Talibon, Inabanga, Tubigon, Calape, Loon, Tagbilaran City, Dauis, Panglao and Lila. 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, Anda, Alicia, Pilar, Dagohoy, Batuan, Bilar and Lila.

The Tsunami Hazard Map (Figure 7 in Annex B) was generated using available tsunami programs, earthquake and tectonic data, and topographic and bathymetric maps. The map shows that coastal municipalities located in the northeast and northwest portions of Bohol are prone to tsunami

The Tsunami Hazard Map is limited to the following:

1. The extent of tsunami inundation is based on current physical conditions of the study area.
2. The map does not reflect the hazard that could be generated by far-field tsunami.
3. Earthquake-induced submarine landslides that could also generate tsunami are not covered by this map.
4. Significant erosion or deposition along the shore in the future could affect the level of tsunami hazard and may need hazard reassessment.

3.2.6 Scenario A.6: Geological Hazards – Volcanic Hazards

There are no volcanoes in Bohol, hence, there is no existing volcanic hazard in the island province.

3.3 Scenario B: Anthropogenic Climate-Change Impacts

Based on annual rainfall distribution, Bohol's climate, as classified by PAG-ASA, belongs to Corona's 4th Type, characterized by rainfall more or less eve nly 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/yr in the mountainous areas in the province. Based on the climatogical records of Tagbilaran City weather station, the province has an annual average of 161 rainy days. Average rainfall and trend has 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 centigrade. Prevailing wind direction is towards northeast with an average speed of 2 miles per record (per reports from PAG-ASA and BSWM).

3.3.1 Scenario B.1: Drought/Heat Stress

The whole province experienced a long drought in 1983 and the El Niño phenomenon usually occurs during the months of April to June. Planting of root crops have partially solved the problem of food and additional income for the farmers during the dry season. People are advised to drink lots of water and stay in cool areas to prevent suffering from the stress of heat.

3.3.2 Scenario B.2: Erosion

Flooding in the major rivers of Bohol is aggravated by excessive siltation due to erosion. The denudation of mountains and forest lands due to various human activities is the primary cause of erosion. Another cause that aggravates the siltation problem is the cultivation of lands along the riparian zones of the river.

Soil erosion in Bohol frequently occurs in areas that have been farmed or at construction sites. Most of the accelerated removal of soil is man-made. According to the Bureau of Soils and Water Management (BSWM) report Table 11), more than 66% of the soils in the province are affected by erosion at different degrees (slightly, moderate and severe) and less than 31% of the island show no apparent erosion. Eight out of the eleven (11) watersheds 15 in Bohol are experiencing 26 to 38 percent soil erosion rates. These sites are now at a critical stage with an annual soil erosion rate of ten cubic meters per hectare.

Table 11. Status of Soil Erosion and Area Coverage

Level of Soil Erosion	Coverage (%)
No apparent erosion	30.75
Slightly eroded	39.09
Moderate eroded	9.88
Severely eroded	17.69
Unclassified	2.59

Source: BSWM Region 7

3.3.3 Scenario B.3: Pests and Diseases Occurrence

Pests and diseases in farmers' crops do occur seasonally. The Bohol Provincial Agriculture Office, through the Municipal Agricultural Offices, is advocating the adoption of Integrated Pest Management as a means of controlling pest and diseases infestation with the use of non-destructive and most appropriate biological control and natural farming system. Such practice minimizes pest population and diseases without compromising the beneficial insects.

On the other hand, the Regional Crop Protection Center (RCPC) introduced the *Bantay Peste* Volunteer Brigade, a community-based pest monitoring system that aims to minimize or prevent crop damages. Ultimately, economic losses are eliminated and data on the pest profile generated for early decision making, issuance of pest advisory to the public and advanced forecasting purposes.

With reference to pest and disease epidemics, there is a need to establish a mechanism for an early warning system (EWS) on threats to agrobiodiversity in the Province of Bohol. An EWS would have reduced the damaging effects of pest and disease outbreaks, such as the ringspot virus in papaya, mosaic and bunchy top viruses in abaca and banana, and the black bug infestation in rice. In the case of the effects of natural disasters, the system of repatriating or reintroducing traditional/farmers' varieties will be a crucial factor in re-establishing the ecosystem.

Dr. Crisol J. Tabarejo, Regional Research Coordinator of the Center for Health Development VII, reported that communicable diseases still constitute as the leading causes of morbidity in the Central Visayas. Other heart diseases occupies the top leading cause of general mortality in Region 7. After the October 2013 earthquake, the UN-OCHA reported that the top five consultations were for acute respiratory infection (64 %), fever (9 %), hypertension (8 %), open wounds and bruises (6 %) and acute watery diarrhea (6 %).

3.3.4 Scenario B.4: Tropical Storms/Typhoons

Bohol is not included in the so-called typhoon belt of the country, as typhoons rarely pass in the province. Those passing below or above the island contribute to the greater volume of precipitation. The frequency of typhoon passage is 0-10% from the average of 20 typhoons passing over the Philippines per year.

3.4 Scenario D: Worst-Case Scenario

Table 12 shows the summary matrix for hazard susceptibility of the 47 municipalities and one city in the province of Bohol. Except for the municipality of Bien Unido, all the rest of municipalities and Tagbilaran City are susceptible both to earthquake and earthquake-induced landslide (EIL). For liquefaction, only the following 15 municipalities are not susceptible to such hazard, namely: Antequera, Balilihan, Candijay, Carmen, Catigbian, Corella, Danao, Loboc, Sagbayan, San Isidro, San Miguel, Sevilla, Sierra Bullones, Sikatuna, and Trinidad. It could be concluded from this data that most inland municipalities are not prone to liquefaction and that all coastal municipalities are susceptible to this geologic hazard.

The worst-case scenario will possibly happen when an 8-magnitude earthquake strikes and/or when high exceedance liquefaction occurs, which would affect the Central Business District (CBD) and urban barangays of coastal municipalities.

Table 12. Summary for Susceptibility of Municipalities to Natural Hazards

Municipality	Geologic Hazards				Hydrometeorologic Hazards			
	EQ	Liquefaction	EIL	Tsunami	Floods	RIL	SS	Others
Alburquerque								
Alicia								
Anda								
Antequera								
Baclayon								
Balilihan								
Batuan								
Bien Unido								
Bilar								
Buenavista								
Calape								
Candijay								
Carmen								
Catigbian								
Clarin								
Corella								
Cortes								
Dagohoy								
Danao								
Dauis								
Dimiao								
Duero								
G-Hernandez								
Getafe								
Guindulman								
Inabanga								
Jagna								
Lila								
Loay								
Loboc								
Loon								
Mabini								
Maribojoc								
Panglao								
Pilar								
Pres. Garcia								
Sagbayan								
San Isidro								
San Miguel								
Sevilla								
Sierra Bullones								
Sikatuna								
Tagbilaran City								
Talibon								
Trinidad								

Municipality	Geologic Hazards				Hydrometeorologic Hazards			
	EQ	Liquefaction	EIL	Tsunami	Floods	RIL	SS	Others
Tubigon								
Ubay								
Valencia								

EQ – Earthquake
EIL – Earthquake-Induced Landslide
RIL – Rainfall-Induced Landslide
SS – Storm Surge

There are 28 municipalities that are susceptible to tsunami while the rest of the 20 inland municipalities are not tsunami-prone, namely: Alicia, Antequera, Balilihan, Batuan, Bilar, Candijay, Carmen, Catigbian, Corella, Dagohoy, Danao, Loboc, Pilar, Sagbayan, San Isidro, San Miguel, Sevilla, Sierra Bullones, Sikatuna, and Trinidad. Most of the liquefaction-prone municipalities are the same municipalities that are also tsunami-prone.

For floods, there are only 18 municipalities that are susceptible to this hydrometeorological haard, namely: Antequera, Balilihan, Candijay, Carmen, Cortes, Dagohoy, Danao, Duero, Guindulman, Inabanga, Jagna, Loay, Loboc, Maribojoc, Pilar, San Isidro, Sierra Bullones, and Valencia.

All the 47 towns and one city are susceptible to rain-induced landslide (RIL), except the municipality of Panglao. For storm surge susceptibility, there are 29 municipalities that are susceptible to storm surge, namely: Alburquerque, Anda, Baclayon, Bien Unido, Buenavista, Calape, Candijay, Clarin, Cortes, Dauis, Dimiao, Duero, Garcia Hernandez, Getafe, Guindulman, Inabanga, Jagna, Lila, Loay, Loon, Mabini, Maribojoc, Panglao, Pres. Garcia, Tagbilaran City, Talibon, Tubigon, Ubay, and Valencia.

In summary, there are forty-seven (47) municipalities that are susceptible to three hazards, namely: earthquake, earthquake-induced landslide and rain-induced landslide. This is followed by liquefaction where 33 municipalities are prone to it. Next is the storm surge with 29 susceptible municipalities, followed closely by tsunami with 28 prone municipalities. The last but not the least is the flood with only 18 susceptible municipalities.

3.5 Scenario E: Most Likely and Worst-Case Scenarios with Humanitarian Consequences and Planning Assumptions

Natural Disaster Scenario	Humanitarian Consequence	Planning Assumptions
Most Likely: • Incidence of any of the hydrometeorologic hazards - flash floods, rainfall-induced landslides, storm surges, earthquake with less than 7 magnitude or earthquake-related hazards • Spread of fire affecting communities due to faulty wires and/or negligence	• Displacement of families • Presence of diseases • Loss of lives and livelihood • Damage to houses and other properties • Affected people sustain injuries	15 coastal municipalities in the northeast and northwest suffer from storm surges while municipalities adjacent to the East Bohol Fault that traverses Loay to Carmen are affected by an earthquake with less than 7 magnitude
Worst:	• Prolonged displacement of	

• Scaled up incidences in most likely scenario, or a combination of two or more hydro-meteorologic hazards occurring simultaneously or in succession and sea mishap	communities • Total power outage, loss of water, breakdown of communications • Outbreak of diseases • Loss of limbs and lives • Communities have difficulty in coping up with the trauma • Destruction of infrastructure (roads, bridges, ports, irrigation facilities, malls, government structures) • Damage to property and livelihood • Social unrest	All 30 coastal municipalities affected by storm surge while all municipalities and the City of Tagbilaran suffer from an earthquake of magnitude greater than 7 plus a combination of total power outage

Climate-Change Impact Scenario	**Humanitarian Consequence**	**Planning Assumptions**
Most Likely: • Anthropogenic climate-change impacts – short-term drought/heat stress, tropical storms/typhoons, pests and diseases incidence	• Damage to houses and properties • Affected people suffer from diseases, health deterioration, decrease in work productivity, decrease in family income	20 to 25 per cent of the total population
Worst: • Anthropogenic climate-change impacts – prolonged drought/heat stress, heightened scale of tropical storms/ typhoons, widespread and prolonged occurrence of pests and diseases	• Displacement of communities • No access to basic services • Outbreak of pests and diseases resulting to economic loss • Loss of limbs and lives • Destruction of infrastructure • Damage to property and livelihood • Social unrest	60 per cent of people living in coastal barangays

Man-Made Incidents Scenario	**Humanitarian Consequence**	**Planning Assumptions**
Most Likely: Hostage-taking, stampede, transport disaster, cyber attack	• Loss of limb or lives • Affected people suffer from trauma or bodily injuries	10 to 20 per cent of the total population
Worst: Occurrence of war, massacre, terrorism	• Massive displacement of communities • No access to basic services • Loss of lives and properties • Destruction of infrastructure • Social unrest	80 to 90 per cent of people living in the province

4. OBJECTIVES and STRATEGIES

The main objective of this PDRRM Plan and Contingency Plan is to guide the humanitarian agencies, both local and international, in responding to a major crisis that may occur in any part of the province of Bohol, complementary of a response that is led by the Provincial Government of Bohol.

This should enable the response to any such crisis to be more effective, faster, with greater coordination, less duplication of effort and better targeting of resources.

The specific objectives of this plan are:

1. To assist and support the affected communities, families, and individuals with a timely and well-coordinated response;

2. To assist and support government agencies, local government units, and other humanitarian stakeholders in efficiently and effectively responding to emergencies in any part of Bohol;

3. To ensure a common understanding of standard operating procedures ahead of a crisis, of mutual capacities and constraints, and corresponding roles and responsibilities of stakeholders; and

4. To strengthen emergency preparedness for natural and man-made disasters.

5. MANAGEMENT and COORDINATION ARRANGEMENTS

The contingency plan details who would do what if a contingency arose, what would be the coordination arrangement, structures and procedures, including the planned response plans of sectors/clusters for a specific scenario. In the four pillars, it lies in between preparedness and response. This can be part of the scope of the preparedness pillar's activities in support to response pillar. The plan covers actions on early recovery and will include the comprehensive rehabilitation of communities affected by disasters.

5.1 Government Coordination and Management Arrangements

The National DRRM Council (NDRRMC) is chaired by the Secretary of Department of National Defense (DND) supported by four vice-chairs each representing the four pillars of the Council, namely: Department of Science and Technology (DOST) for Mitigation and Prevention, Department of Interior and Local Government (DILG) for Preparedness, Department of Social Welfare and Development (DSWD) for Response, and the National Economic Development Authority (NEDA) for Rehabilitation and Recovery.

5.1.1 Regional/Provincial/Municipal Disaster Risk Reduction and Management Council

At the regional level, the Regional Disaster Risk Reduction Management Council (RDRRMC) serves to coordinate, integrate, supervise and evaluate the activities of Local Disaster Risk Reduction

Management Councils. In the Central Visayas, one of the Governors of the four provinces (Cebu, Bohol, Negros Oriental, Siquijor) chairs the RDRRMC, with the Office of Civil Defense (OCD) providing secretariat support to the council. The RDRRMC has oversight function if emergency is affecting two or more provinces. The Provincial DRRMC takes the lead if emergency is at the province level, or that affecting two or more municipalities. The Municipal DRRMC or City DRRMC is convened when an emergency is affecting two or more barangays.

At the provincial level, there is the Provincial Disaster Risk Reduction and Management Council that prepares the PDRRM Plan (PDRRMP), which serves as a roadmap on how DRRM contributes to the sustainable development in the province. It is based on the 2010 Philippine Disaster Risk Reduction Management Act, otherwise known as Republic Act 10121, which is the basis of disaster management and coordination structure in the country. It outlines the key activities of the four pillars with the goal of improving communities' resilience to disasters and improving institutions capacities in disaster risk reduction, preparedness and response capacities at all levels. The PDRRMP aims to prevent disaster from happening, where possible and/or mitigate its impact, if these could not be prevented. The Plan is comprehensive, as it covers rehabilitation and recovery.

The relationship between the Provincial Government of Bohol, the leader of the overall early recovery efforts after the earthquake, and the humanitarian community to complement those efforts is very positive. Response coordination is now structured around the following clusters: CCCM, Child Protection/Gender-Based Violence (GBV), Early Recovery and Livelihoods, Education, Food Security, Health/Reproductive Health, Nutrition, Shelter and WASH. The government leads each cluster and is supported by an international partner co-lead. Early Recovery and Livelihoods have merged as most actors are working in both sectors. Some clusters, such as WASH and CCCM, have also established coordination mechanisms at the barangay (district) level to ensure full inclusion of all government levels of Bohol in the recovery phase. The CCCM cluster is also working with barangay-level partners to strengthen coordination mechanisms for evacuation camps, housing and resettlement work.

Humanitarian partners have conducted trainings on humanitarian response coordination for local partners and local authorities, to whom the cluster approach is a new concept, in order to work better together. They have also conducted advocacy and training activities on humanitarian principles, equitable and efficient distribution of aid, and the need to consult with and have clear communication with affected communities. Links are being strengthened with development actors, and the coordination structure is evolving in preparation for the end of the humanitarian phase of the response to ensure that activities are connected to longer term plans (UN-OCHA).

5.1.2 PDRRMC Command Center

Upon declaration of an emergency by the Sangguniang Panlalawigan of Bohol, the Governor shall immediately set up the Command Center for the PDRRMC. One or two representatives of key government departments, security organs, UN agencies, and non-government agencies (NGOs), if need be, shall be nominated to any unit of the Center for liaison and information sharing between the key stakeholders. The Center shall be provided with a room and communications and other facilities by the Office of the Governor. During the initial stages of an emergency, the Center shall operate on a 24/7 basis. When the situation has been stabilized and the response mobilized, the Command Center may reduce its hours of operation as appropriate.

The PDRRMC Bohol Command Center shall be composed of the Relief Operations Center (OPSWD/DSWD), RDRRMC Command Post (OCD-7), Search and Rescue/Recovery, Casualty

Validation Center (PNP), and the Medical and Health Team (PHO/DOH). Different units of the PDRRMC are as follows:

a. Communications: filters and responds to incoming emergency calls according to severity (injury) and accessibility of response; was instructed to prepare damage reports.

b. Emergency Response: activates all emergency medical responders; deploys one (1) Team to coastal areas in the city to inform residents of "No Tsunami Alert" raised and designates a possible evacuation area; and deploys two (2) Ambulances to respond to medical/trauma emergencies resulting from the disaster.

c. Search and Rescue (SAR): activates all Search and Rescue Operations; deploys one (1) Team for the Search and Rescue operations within the city.

d. Emergency Response/SAR: organizes the Incident Command System; briefs Search and Rescue teams coming from other provinces and organizations on the current status and information vital for their response; deploys to areas identified where possible trapped victims are reported; deploys to ERU to hospitals to help transfer patients to better-equipped hospitals in the city; deploys two (2) ambulances in response to medical/trauma emergencies resulting from the disaster.The emergency response shall focus on the search and rescue of affected people including retrieval of dead bodies under the rubble.

e. Relief Operations: distribution of basic supplies such as food, water, clothing, shelter, medical care and minimum household utility goods.

Repair and restoration of roads, electricity and communication networks; and salvaging damage to agriculture, distribution of seeds and fertilizer, etc. shall be considered for the next phase: early recovery.

5.1.3 Cluster Coordination

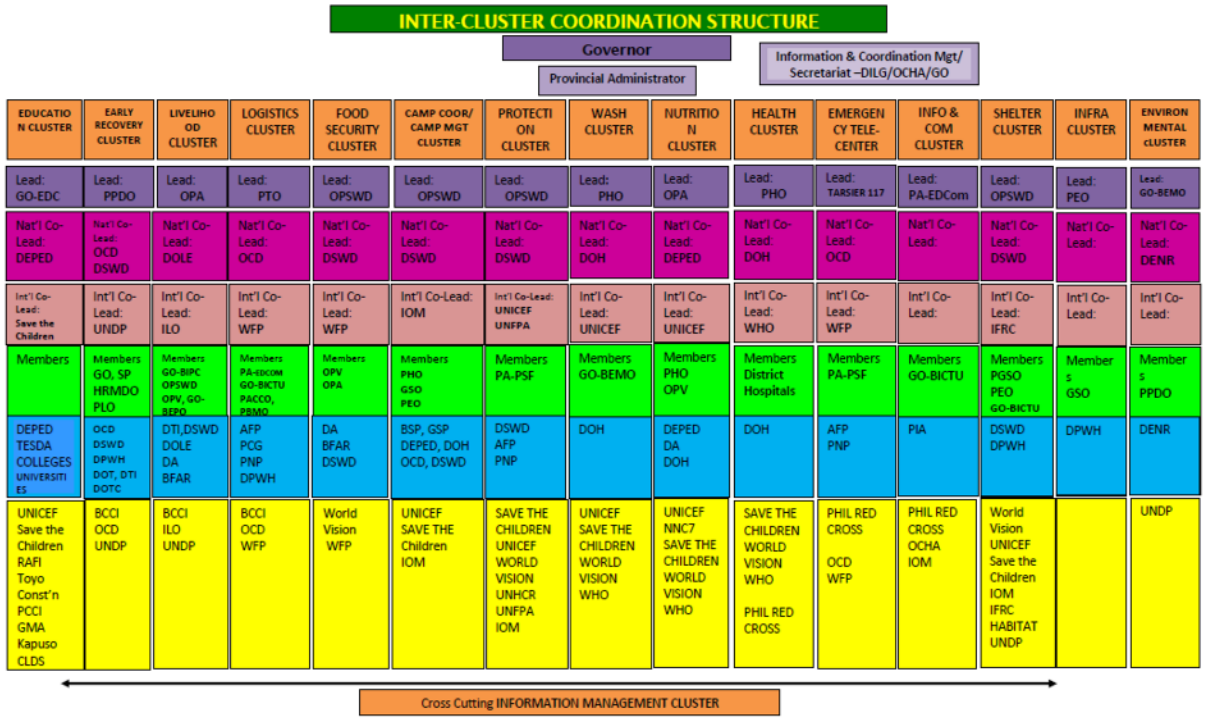
The cluster approach in humanitarian response was adopted by the Philippine Government through a National Disaster Coordination Center Circular in 2007, and continues to be used to date in emergency situation. The Government takes the cluster leadership with UN agencies and IOM co-leading the clusters. Clusters are groupings of agencies, organizations with designated lead working in an area of humanitarian response in which gaps have been identified. The purpose of clustering is to maximize the response and minimize the gaps.

Sector/Cluster	Government Lead Agency	Humanitarian Co-Lead Agency
Social Sector		
CCCM	OPSWD	IOM
Education	DepED	UNICEF
Health	PHO	
Nutrition	OCD	UNDP
Protection	OPSWD	
Shelter	PEO	
WASH	PHO	UNICEF
Economic Sector		
Food Security	DSWD and DA	WFP
Livelihood	BEPO	
Environment	BEMO	

Sector/Cluster	Government Lead Agency	Humanitarian Co-Lead Agency
Infrastructure Sector		
Roads	PEO	
Bridges	PEO	
Ports	PEO	
Energy	PPDO	
Water	PPDO	
Irrigation	PAO	
Development Administration		
Early Recovery	PPDO	UN-OCHA
ICT/CwC	BICTU	
Logistics	PTO	
TaRSIER 117	Provincial Administrator's Office	

Below is the coordination structure showing the inter-cluster coordination in Bohol, which is based on the Post-Great Bohol Earthquake Transition Plan as reported by Mr. Jock Paul, Head of UN-OCHA. These clusters shall be elaborately discussed in the subsequent Section 6.4.

Bohol Provincial Inter-Cluster Coordination



Mental health/psychosocial support – PYDO/Laum
Shelter – PPDO/Roni

5.2 Inter-Agency Coordination and Management Arrangements

Agencies involved in this Contingency Plan are those coming from the government, non-government organizations operating within the area, international organizations, and other private agencies or volunteers.

5.2.1 Government Agencies

Government agencies from the national, regional provincial, municipal or barangay levels shall be coordinating with each other to synchronize movements and optimize the utilization of scarce government resources. The lead government agency in the activation of this Contingency Plan shall be the PDRRMC, led by the Governor. National government agencies with a counterpart office at the provincial level shall directly coordinate for faster decision-making and response, provided that the PDRRMC Chairperson shall be constantly updated on all actions taken on the ground.

5.2.2 Non-Government Organizations

NGOs that are operating within the Province of Bohol are free to participate in any emergency response to disasters or emergencies, provided they submit a proper report to the PDRRMC for any action taken in response to disasters and emergencies.

5.2.3 International Organizations

Various international organizations have already shown their support and commitment to help the earthquake victims of Bohol from October 2013 up to the present. The United Nations – OCHA led all other international organizations in the preparation of the Post-Great Bohol Earthquake Transition Plan in March 2013 to prepare the PGBh clusters smoothly manage the disaster even in the absence of these organizations, which are bound to leave the province for other humanitarian mission somewhere else.

5.2.4 Cluster System

Right after the 2013 earthquake tragedy, the cluster system was adopted by the Provincial Government of Bohol and is currently in place, led by the, supported by international counterparts. Cluster meetings take place on a weekly basis as does the inter-cluster coordination meeting (ICCM). The Provincial Disaster Risk Reduction & Management Council (PDDRMC) chaired by the Governor is also held weekly. Some clusters now hold cluster meetings every other week. The ICCM allows clusters to discuss cross-cluster challenges and approaches, such as WASH facilities in ECs and water monitoring activities, and serves as a platform for clusters to discuss matters to be raised with the Governor at PDRRMC meetings (UN-OCHA Report).

5.3 Arrangements for Resource Mobilization and Funding

Through the conduct of joint assessments, using the Rapid Needs Assessment form (See Annex C), and the collation and analysis of the information collected, the needs arising from a humanitarian crisis shall be clearly determined. During a crisis, reporting from the Provincial Government of Bohol (PGBh) to the National Government shall be frequent.

Having the primary responsibility, the PGBh, through the Governor, shall endeavour, to make available the DRRM funds and ask for additional funding from the National Government, or solicit from the private sector, other local government units, and international organizations.

The Logistics Cluster shall ensure transparency, accountability, and responsibility in handling donations (in cash or in kind) to ensure that those most affected communities, families, or individuals are given immediate assistance, particularly those belonging to the marginalized or vulnerable sector.

6. ACTIONS on ACTIVATION

6.1 Preparedness Actions

6.1.1 Finalization of the PDRRM and Contingency Plan

The Contingency Plan for man-made incidents shall be finalized by the third quarter of the year, after a public consultation with stakeholders. Thereafter, the Plan shall be reviewed every quarter of the year and amended, as necessary. Clusters shall be given the opportunity to revise and refine their plans. If it is necessary to revise the Current Situation or one or all of the scenarios, all cluster plans shall be reviewed and revised accordingly.

6.1.2 Contingency Training

The PDRRMC shall endeavour to organize trainings related to the PDRRM-Contingency Plan with all stakeholders. Such training may involve a simulation exercise and shall include specific training on the use of the Rapid Needs Assessment tool.

6.1.3 Relief Supplies

Clusters have identified the resources that they would require in the event of a disaster as per the three scenarios. Subject to fund availability, agencies, departments, and clusters shall procure relief items and preposition them at the Bohol Cultural Center.

Without requiring the expenditure of funds, agencies shall determine the sources from which they would procure relief items in the event of an emergency. This may include the prequalification of suppliers and possibly, the signing of framework agreements and contracts, thus, reducing procurement lead times.

6.1.4 Early Warning and Monitoring Systems

Collectively, the DRRM Councils at the municipal and barangay levels have easy access to information and have a reasonable first-hand experience on what is happening on the ground with respect to man-made or natural disasters. Besides, the PAG-ASA and PHIVOLCS both issue early warnings on possible forthcoming disasters. However, more training and hard work is required to come up with an effective monitoring and early warning system, pooling the information collected by the various sources, analysing, and attempting to make predictions.

6.2 Timeline of Actions

Within 24 hours

No	Activities	Responsibility
1	• Declare emergency and alert partners • In the event of large scale disaster, the Government requests international support	PDRRMC RDRRMC NDRRMC
2	Establish a PDRRMC Command Center	PDRRMC
3	Meeting of PDRRMC/RDDRMC: • Provide comprehensive briefing as possible • Determine initial strategy for response (based on contingency plan) • Determine arrangements for Joint Rapid Needs Assessment (RNA) • Activate the contingency plan	PDRRMC RDDRMC
4	• Mobilize clusters for emergency response • Activate emergency logistics and emergency telecommunications cluster, if necessary	PDRRMC RDRRMC OCD
5	Assess the safety and security situation in affected areas	PDRRMC/RDDRMC
6	Deploy a joint rapid needs assessment mission to affected areas	PDRRMC RDRRMC
7	Disseminate information collected from joint RNA	PDRRMC

Within 48 hours		
No	Activities	Responsibility
8	Meeting of the PDRRMC/RDDRMC to: • Review RNA • Determine immediate LGU response capacity and gap areas for response by the region/national/ humanitarian community • Identify any aspect of the contingency plan to vary given the specific emergency; reinforce roles and responsibilities	PDRRMC OCD RDRRMC
9	Provide emergency relief based on results of joint RNA, using available funding and emergency stocks	LGUs/PGBh NGAs Clusters
10	Meeting of the PDRRMC/RDDRMC to brief government departments on the emergency situation	PDRRMC/RDDRMC
11	Meeting of the PDDRMC to coordinate response of NGOs and private donors	PDRRMC/RDRRMC
12	Clusters meet to coordinate member response - who, what, where, when, and how to report progress and further needs identified	Cluster leads Co-leads
13	• Suspend non-essential programs and deploy staff and resources to emergency • Deploy required additional staff from regional/national offices	Government Agencies
14	Collect and consolidate data for information bulletin (situation reports, needs analysis)	Clusters/OCD
15	Conduct media briefings and issue press releases	PDRRMC/RDRRMC

Within the first two weeks		
No	Activities	Responsibility
16	Review present funding capacity to respond as scale of	PDRRMC/RDRRMC

	emergency becomes clearer (government funding)	
17	Determine resource mobilization options for unmet needs	PDRRMC/RDDRMC
18	Convene coordination meetings as needed	PDRRMC/RDDRMC
19	Consolidate information (3Ws), analyze gaps and material assistance flow	PDRRMC/RDRRMC
20	Review initial response, identify coordination bottlenecks and build flexibility into response	PDRRMC/RDDRMC
21	Facilitate administrative procedures for the import of humanitarian equipment and goods	PDRRMC/RDRRMC
22	• Identify on-going reception sites for IDPs • Plan intervention for the coming months	PDRRMC/RDDRMC
23	Conduct media briefings and issue press releases	PDRRMC/RDDRMC

6.3 Assessment Arrangements

Assessments shall ideally be led by the Provincial Government, with the participation of national government agencies, local government units, international organizations and NGOs. Upon declaration of an emergency and the activation of the Contingency Plan, a Joint Rapid Needs Assessment (JRNA) of affected areas shall be conducted. This JRNA shall utilize the NDCC-mandated form, which is found in Annex C. Participants of the JRNA may include:

a. Office of the Governor and attached offices' staff
b. Provincial Disaster Risk Reduction and Management Officer (PDRRMO)
c. Provincial Engineer's Office
d. Office of the Provincial Social Welfare and Development (OPSWD)
e. Office of the Provincial Agriculturist (OPA)
f. Office of the Provincial Veterinarian (OPV)
g. Department of Social Welfare and Development (DSWD)
h. Provincial Health Office
i. Department of Health (DOH)
j. Department of Agriculture (DA) and attached agencies
k. Department of Education (DepED)
l. Department of Public Works and Highways (DPWH)
m. Department of Environment and Natural Resources (DENR)
n. Department of Science and Technology (DOST)
o. Other national government agencies
p. Local Government Unit officials
q. Non-Government Organizations operating in the area
r. International organizations

After all threats to life and property have been addressed, assessments shall be organized by the PDRRMC, a task that may be delegated to any Unit Manager of the Command Center. Participants shall meet before the assessment to agree on the objectives, mechanics, and division of labor and to share currently available information. A Damage Assessment and Needs Analysis (DANA) shall be carried out by the Provincial Government through the PDRRMC, in coordination with the national government agencies, local government units, international organizations and NGOs, as a basis for an informed approach to the drafting of the plan for restoration.

Detailed, comprehensive and accurate assessments of the damage, as well as an understanding of the felt needs of the affected community, can help identify critical areas that need to be prioritized for funding and immediate action on the following:

a. Effects on Basic Services: electricity, water supply (potable water and irrigation water), sanitation
b. Infrastructure: buildings, hospital/clinics, homes, road systems
c. Livelihood: crops, livestock, fisheries, sources of food/products
d. Landscape: soil stability, extent of coastline and land erosion
e. Ecological Communities: vegetation, terrestrial and aquatic life, forest cover

After the assessment has been completed, participants shall meet to share results and to discuss key findings. Assessment information shall then be compiled, on the Government side, by the Provincial Planning and Development Office (PPDO). Similarly, the international organizations may collate, compile, and analyse information collected during assessments and disseminate to the PDRRMC Members within 24 hours of the assessment taking place.

Clusters shall arrange their own specific cluster assessments, using methodologies and forms developed by those clusters, as per instruction of the PDRRMC. International organizations shall also provide information management support, including the production of maps, both general and thematic. There may be several assessments going on at each time.

6.4 Summary of Response Plans by Cluster Per Sector

Based on the agreed scenarios and planning assumptions, specific sector objectives and response plans shall be developed in relation to the overall contingency plan objectives and strategies. Across the plans, it is emphasized that responses be properly informed by needs assessments.

To come up with a proper and acceptable program for recovery and rehabilitation, the felt needs of affected communities will be identified through interviews to ensure public acceptance and support of the plan. Bohol's early recovery efforts will be based on the following principles:
1. Focus on the most vulnerable
2. Restore capacities
3. Rebuild people's livelihoods
4. Secure human development gains
5. Reduce disaster risk
6. Engage the private sector
7. Independence and self-sufficiency
8. Transparency and accountability
9. Subsidiarity and decentralization
10. Coordination

Based on the output of the four sector groups (Social, Economic, Infrastructure and Development Administration, there are common challenges and strategies that need to be considered in the Transition Plan of the Province of Bohol, which could be considered in this Contingency Plan. Among them are the following:

- Enhancement of Data management system
- Strengthening of the Monitoring and Evaluation System
- Resource mobilization
- Technology enhancement
- Upgrading of procurement system for communication, social-economic services, infrastructure, and among others
- Advocacy and Capacity Development
- Policy development
- Information Management system

- Partnership with LGUs and institutions (national, academe, NGOs, and donors)
- Rehabilitation of waterworks system
- Selection criteria for beneficiaries specifically on the Post Bohol Earthquake assistance from different sectors/organizations
- Relocation sites for the affected families
- Institutional arrangement B/M/C/Provincial Disaster Risk Reduction Management Council
- Enhance Barangay Council for the Protection of Children (BCPC)/Community-Based Child Protection Network (CBCPN)
- Integration of Gender and Development in B/M/C/Provincial development plans
- Provision of health, education and other social-economic and infrastructure facilities
- Technical Assistance in the preparation of Feasibility Study (FS), Project Design Preparation and Project Detailed Engineering
- Integration of Contingency planning at the Disaster Risk Reduction Management Plan
- Donations (in kind) from different donors shall be properly channelled to local beneficiaries and shall be properly recorded and accounted in the PGBh

6.4.1 Social Sector

6.4.1.1 Camp Coordination and Camp Management (CCCM)

Camp Coordination and Camp Management underscores in its response plan the utilization of the DRRM plan for emergency response and disaster preparedness. In the worst case scenario, there is a need to conduct profiling and registration of Internally Displaced Persons in order to determine the needs of displaced people and families. In this situation, non-food items and emergency shelter assistance are to be augmented.

6.4.1.2 Education

In order to ensure continuous access to education of students, the Education cluster will provide alternative temporary learning facilities, establish counselling and stress management centres. Furthermore, the cluster will involve other organizations and volunteers in order to maximize the impact of assistance.

6.4.1.3 Health

Health cluster will work on responding to the assessed health needs of affected communities with mobile health teams and mobile clinic, and by providing health outposts in evacuation centres under the worst case scenario. The team ensures that emergency health services are provided in these health posts. In the most likely scenario, the cluster will work on rehabilitation of community health facilities and strengthening of early warning system, as well as disease surveillance in the community.

6.4.1.4 Nutrition

To reduce malnutrition level of children under-five, as well as malnutrition of lactating mothers, the Nutrition cluster will conduct therapeutic feeding and supplementary feeding programs in health institutions and schools. It will also establish a nutrition education program in schools.

6.4.1.5 Protection

To respond to the protection issues and concerns, the Protection cluster will identify and establish a monitoring body that will assess, verify, document, and report protection issues. The cluster also emphasized the need to have proper coordination between Government agencies and other stakeholders.

6.4.1.6 Shelter

The Shelter cluster shall immediately identify displaced families/individuals. In coordination with the Infrastructure cluster, the Shelter cluster shall assess damaged houses and properties and prepare a Shelter and Reconstruction plan. It shall distribute tarps and tents to families with damaged houses as well as IEC materials on debris management. It will work for the permanent resettlement or return to homes of the affected and displaced households.

6.4.1.7 Water, Sanitation and Hygiene (WASH)

In Water, Sanitation and Hygiene (WASH), the conduct of WASH survey, and the provision of safe drinking water to target 250,000 affected people by a unified team led by the Government are priority actions in a worst case scenario. For the most likely scenario, WASH team needs to be set up in each province, with stockpiles in place for 50 per cent of the target affected population.

6.4.2 Economic Sector

6.4.2.1 Environment

The Environment cluster ensures the presence of ecological restoration through recovery of ecosystems and habitats after disturbance or damage. It endeavors to promote the preservation of the ecosystem's biodiversity, conservation of endemic and indigenous species, and the sustainable management of the ecosystem. Traditional and local concepts, technology, and practices of the people shall be respected in responding to recovery and restoration of the environment.

6.4.2.2 Food Security

The Food Security cluster ensures that there is a timely and equitable distribution of food assistance to affected population, under the cluster leadership of DSWD. For communities to immediately recover their damaged agricultural assets, the cluster to conduct timely distribution of agricultural inputs like seeds, including livestock support and fishing gears.

6.4.2.3 Livelihood

The Livelihood cluster targets the distribution of fishing gears, assorted vegetable seeds, tilapia fingerlings and livestock to respond to the needs of affected communities. Letters shall be sent to banks and microfinance organizations appealing for the moratorium of interests, amortizations, and penalties of borrowed financial support for farmers. Veterinary mission shall be conducted in areas where farm animals were stressed during the earthquake. Jobs shall be given through the Bohol Emergency Employment Project (BEEP) and Cash-for-Work Programs while the unemployed shall undergo Skills Training and Emergency Employment Towards Recovery (STEER)

6.4.3 Infrastructure Sector (Roads, Bridges, Ports, Energy, Water, Irrigation)

The Infrastructure cluster aims to restore the basic services as soon as possible through immediate inspection and evaluation of damaged infrastructures by local building officials and expert engineers, preparation of detailed damage reports, and in coordination with government and private agencies, conduct immediate repair and restoration of major roads, bridges, water, electricity, communication networks, ports, and irrigation facilities. Debris management is also one aspect of disaster management that the Infrastructure cluster shall take charge of.

6.4.4 Development Administration Sector

6.4.4.1 Early Recovery

Early Recovery (ER) highlights the need for implementing preparedness activities like mapping of areas, and its hazards, as well as the organizations with capacities to respond. Support to assets recovery is also needed such as training and microfinance to start a new business. In the worst case, ER cluster will respond to support the livelihood activities of affected populations, including support on community-led repair of damaged infrastructure.

An integrated multi-sectoral approach was used in delivering early recovery interventions, focusing on the specific needs of key affected areas. Problems, needs, resources, capacities and development potentials available at the local level were identified. Programs and projects were considered for operational interventions over a period of 12 to 18 months after the disaster. Sectors that were particularly relevant during the early recovery phase were categorized into twelve clusters, as follows:

a. Food and Warehouse Cluster
b. Shelter Cluster
c. Protection Cluster
d. Camp Coordination and Camp Management (CCCM) Cluster
e. Health Cluster
f. Water, Sanitation and Hygiene (WASH) Cluster
g. Infrastructure Cluster
h. Government Structures and Facilities
i. Education Cluster
j. Logistics Cluster
k. Livelihood Cluster

6.4.4.2 Emergency Telecenter

The Emergency Telecenter cluster clearly defines the services to be provided for timely, predictable, and effective inter-agency telecommunications to support humanitarian operations and ensure personal security. The ETC ensure immediate dispatch of TaRSIER 117 emergency responders, search and retrieval teams to affected communities. It also assures of fast dissemination of weather advisories to municipal and barangay DRRMC and establishes common links with LGUs on their immediate needs that will be immediately relayed to the PDRRMC for appropriate action.

6.4.4.3 Information Communciation and Technology (ICT)/ Communication with Communities (CwC)

The ICT/CwC cluster makes sure that social order is restored through proper communication. Its planned response is through communication with communities for safety and proper guidance while

immediate dissemination of information, warnings, advices to the people by means of print, broadcast, electronic means is ensured by this cluster.

6.4.4.4 Logistics

The Logistics cluster aims to establish transparency, accountability, and responsibility in handling donations and funds for calamities and the wise use of scarce resources by prioritizing aid to the most affected individuals/families/communities and timely purchase/distribution of relief goods . It shall prepare and publish report on donations (in cash or in kind), secure the list of priority individuals/families/communities from the DSWD, LGUs and other agencies as basis for budgeting and allocating of cash and goods for immediate relief, provide a forum for information sharing, identifying (potential) bottlenecks and operational support, manage shared warehousing facility, prioritize goods based on identified humanitarian priorities, deploy Logistics Response Team, and create logistics hubs.

7. CLUSTER RESPONSE PLANS

7.1 Camp Coordination and Camp Management Cluster

Camp Coordination and Camp Management Cluster	
Cluster Scenario Assumption	*Most likely*: 20,000 affected population *Worst case:* 300,000 affected population
Cluster Response Objectives	1. To ensure support of LGU for implementation of DRRM law (RA 10121) 2. To provide augmentation resources from Non-Government Agencies/ Organizations and international organizations 3. To provide technical assistance for facilitation, coordination and information management in support of Government initiatives. 4. To strengthen coordination mechanisms among stakeholders. 5. To establish social preparation for people's participation.
Response Plan	• Utilize DRRM fund for emergency response and disaster preparedness. • Augmentation of NFIs and emergency shelter assistance provision. • CCCM Training for the Camp Management Team. • Conduct IDP tracking, profiling and registration • Establish a system to continuously track IDP: (1) positions (2) status (3) gaps in assistance provided • Determine specific and immediate needs of IDPs to relevant Government agencies and other service providers. • Organize IDPs to manage the camps. • Mobilize community volunteers to assist in emergency response. • Develop a Comprehensive Resettlement Strategy
Personnel Requirements	• Current personnel capacity for *most likely scenario* • Surge support for *worst case scenario*
Supplies Equipment	• IM system and hardware set-up • Lifesaving NFIs and emergency shelter kits • Trained support staff from NGOs, LGUs and other regions
Partnership Arrangements	• Sustain partnership with cluster lead, DSWD through its offices at different levels (provincial and municipal) • Coordinate and collaborate with Government line agencies. UN agencies, INGOs, national NGOs and partners.
Coordination Arrangements	• Regular CCCM meetings • Regular humanitarian needs assessments and monitoring • Information sharing with relevant agencies • Regular communication and coordination with national cluster and Humanitarian Country Team (HCT) • Conduct of intercluster coordination and referral system • Coordination with security sector (AFP, PNP) for timely delivery of response/assistance
Budget requirements	• To be determined

Camp Coordination and Camp Management Cluster	
Preparedness Activities	• Stockpiling • Creation of data bank set • Establishment of referral system • Capacity building for disaster response • Regular meeting • Hands-on training for information gathering and surveys

7.2 Early Recovery Cluster

Early Recovery Cluster	
Cluster Scenario Assumption	*Most likely* : 20,000 affected population *Worst case:* 100,000 affected population
Cluster Response Objectives	• Augment ongoing emergency assistance operations by building on humanitarian programs to ensure that inputs become assets for recovery and long-term development • Build capacity of CCCM members, local leaders and other stakeholders for effective early recovery response and disaster preparedness • To support/assist the affected communities to restart their lives
Response Plan	• Conduct needs and capacity assessments for local authorities to leade early recovery • Assist communities to formulate ER plans (including risk reduction, feasibility plan for early economic recovery, emergency employment possibilities) • Strengthen LGU capacities to plan and manage ER and longer-term development • Provide for the basic needs of affected populations such as food, water, temporary shelter and livelihood support • Provide psychosocial treatment/counselling to the affected families with Trauma • Introduce climate-resistant crops, e.g., drought/flood-prone type of crops for IDPs and host communities • Institutionalize community-based ER activities • Support spontaneous livelihood recovery initiatives of affected families through institutional partnerships and technical assistance • Train newly elected officials in ER
Personnel Requirements	• ER Adviser for planning and guidance • Focal person with skills on post-crisis livelihood response programs, DRR, institutional capacity development and coordination • Agriculture livelihood or agribusiness specialist
Supplies Equipment	• Livelihood kits for *most likely scenario* • Emergency employment for *worst case scenario* • Training materials on disaster management, ER management
Partnership Arrangements	• Government and NGO, CSO partners for *most likely* • Scale up partnership to include security forces and parties in conflict, as applicable for *worst case scenario*
Coordination	• ER Cluster meetings

Early Recovery Cluster	
Arrangements	• Coordination with other clusters and stakeholders
Budget requirements	• To be determined
Preparedness Activities	• Prepare the area profile, including mapping of areas • Identify safe areas for settlement • Establish information sharing mechanisms within the cluster and inter-cluster through IM tools • Establish contingency plans for continuity of CCCM strategies and actions • Establish security and safety guidelines in the CCCM cluster • Stockpile NFI and emergency shelter packages • Conduct inventory of suppliers and provide accreditation of suppliers • Formulate Early Recovery Plan • Advocate for and mainstream ER perspectives in other cluster plans • Strengthen ER cluster

7.3 Education Cluster

Education Cluster	
Cluster Scenario Assumption	• *Most likely*: destroyed school infrastructures, destroyed school roads, pupils/students and parents traumatized • *Worst case:* all schools and school facilities destroyed, disruption of classes, and early education system not materialized due to hazards or fear
Cluster Response Objectives	• To increase access of students to education • To re-establish the education system of affected areas
Response Plan	*Most likely* • Assess the impact of an event/disaster to education • Provide alternative learning mode/temporary education centers or facilities • Evaluation of impact to children • School feeding • Establish temporary counselling and stress management centers • Apply system on hygiene and sanitation system *Worst case* • Surge/external support is needed when state of calamity is declared, and • cluster approach is activated • Assess education impact • Rebuild education system • Reconstruct school facilities • Reproduce school materials • Mobilize involvement of volunteers and other organizations
Personnel Requirements	• *Most likely:* teaching and construction volunteers, teachers, education coordinator, health specialist • *Worst:* technical people, engineer/builders and humanitarian workers

Education Cluster	
Supplies Equipment	• reading materials, school supplies, learning kits for teachers and students • building materials and equipment • WASH, Food and toys • Tents
Partnership/ Coordination Arrangements	• Department of Education as the cluster lead, with LGU at the local level • Local NGOs support • Local coordination through DRRMC
Budget requirements	• Local/country-based resource, LGU funds, national funds, UN agencies
Preparedness Activities	• Adopt school safety drills • Put in school warden/incident response system • Mapping of school locations • Construction of rescue facilities with basic mode of communications • Training of Trainers for Psycho-Social Support

7.4 Emergency Telecenter Cluster

Emergency Telecenter Cluster	
Cluster Scenario Assumption	• *Most likely*: destroyed telecommunication infrastructures • *Worst case:* all telecommunication infrastructures and facilities destroyed,
Cluster Response Objectives	• Provide clearly defined services to ensure timely, predictable, and effective inter-agency telecommunications to support humanitarian operations and ensure personal security
Response Plan	• Immediate dispatch of TaRSIER 117 emergency responders, search and retrieval teams to affected communities • Fast dissemination of weather advisories to municipal and barangay DRRMC • Establish common links with LGUs on their immediate needs that will be immediately relayed to the PDRRMC for appropriate action
Personnel Requirements	• TaRSIER 117 staff • Effective Development Communication Staff • Bohol Law Enforcement Communications System staff
Supplies Equipment	• Emergency power generator or portable solar power supply
Partnership Arrangements	• Stand-by arrangement with telecommunications service providers • Use of corporate partners (Smart, Globe, Sun operators)
Coordination Arrangements	• Information sharing between cluster members • Regular cluster meetings • Coordination with Logistics cluster to ensure expedient delivery of ICT equipment and to provide updates on ETC infrastructure to support operations
Budget requirements	• One-time costs • Operational expenses specially air-time load

Emergency Telecenter Cluster	
	• Maintenance and training costs
Preparedness Activities	• Conduct assessment of ICT capability at the local level • Institutionalization and strengthening of the Provincial Disaster Preparedness and Emergency Management Office • More trainings for the TaRSIER 117, including LGUs, to enhance the communication efficiency of emergency responders and hospitals. • Organization of more volunteer groups in every LGU • Strengthened links with LGUs • Enhancement of communication processes and systems for better disaster management • Training on Incident Command System (ICS) in responding to and coming up with protocols for the following: Natural Hazards (Geologic, Hydro-Meteorologic), Natural or Anthropogenic Climate-Change Impacts, and Man-Made Incidents • DRRM/CCA Trainings in preparation for Operational Mechanisms/Tools for DRRM at the LGU level • Source out funding support for capability building program

7.5 Environment Cluster

Environment Cluster	
Cluster Scenario Assumption	• *Most likely*: partially eroded land and coastlines, partially destroyed vegetation, forest cover or terrestrial or aquatic life • *Worst case:* totally eroded land and coastlines, totally destroyed vegetation, forest cover or terrestrial or aquatic life
Cluster Response Objectives	• Ecological restoration to assist the recovery of ecosystems and habitats after disturbance or damage • Promote the preservation of the ecosystem's biodiversity, conservation of endemic and indigenous species, and the sustainable management of the ecosystem.
Response Plan	• Damage Assessment and Needs Analysis (DANA) in terms of the landscape (soil stability, extent of coastline and land erosion) and the ecological communities (vegetation, terrestrial and aquatic life, forest cover) • Salvage of damaged environment • Immediate restoration of environment • Proper respect to traditional and local concepts, technology, and practices of the people in responding to recovery and restoration of the environment
Personnel Requirements	• Bohol Environment Management Office personnel • Municipal Agriculture Office personnel • DENR personnel
Supplies Equipment	• IEC/Advocacy materials • Seedlings for indigenous trees, mangroves
Partnership Arrangements	• Department of Environment and Natural Resources • Mines and Geosciences Bureau (MGB)

Environment Cluster	
Coordination Arrangements	• Local Government Units
Budget requirements	• To be determined
Preparedness Activities	• Training on DANA • Preparation of Comprehensive Project Profiles on environmental-related projects • Adopting the best practices for: ➢ Forestry: reforestation, protected areas, indigenous tree planting ➢ Coastal resources: mangrove reforestation, resilient water-based livelihood, early warning system (EWS) • Lobby for the prioritization of the following strategic policies: i. Support initiatives in climate change, resiliency and environmental management. ii. Improve communities' capacity to manage disaster risks and deal with their adverse effects. iii. Encourage "green" infrastructure. iv. Ensure continued implementation of the Bohol Environment Code.

7.6 Food Security Cluster

Food Security Cluster	
Cluster Scenario Assumption	*Most likely*: • natural disasters cause major displacement of 100,000 IDPs • widespread loss of household and productive assets • serious nutrition concerns • emergency interventions may last for a few months *Worst case:* • natural disasters cause major displacement of 250,000 IDPs • Widespread destruction and loss of property • Serious nutrition and health concerns • Emergency could last for several years
Cluster Response Objectives	• Ensure the availability of sufficient quantity and quality of drinking water, rice and other food items • Maintain support to food and nutritional security of affected populations, particularly vulnerable groups • Meet emergency food needs of victims or survivors • Maintain or scale up nutrition programs • Assess and address food and nutrition security of vulnerable groups • Prioritize emergency assistance due to the scale of the emergency • Augment ongoing emergency assistance operations to ensure that inputs become assets for recovery and long-term development in agriculture and rural sector

Food Security Cluster	
	• Support spontaneous agricultural-related recovery intiatives by affected communities
Response Plan	1. Declaration of state of calamity by the Government 2. Cluster coordination initiated , with the OPSWD as the lead office 3. Identify hardest hit municipalities and affected families based on poverty incidence, damage to properties, and displaced families 4. Organize volunteers and support groups for the repacking of relief goods and distribution system 5. Conduct rapid emergency food needs assessments (with inter-cluster assessments) 6. Prepare family ready-to-eat food packs with bottled water and distribute these to affected communities 7. Provide seeds/tools to the displaced for small gardening 8. Activate coordination with Logistics cluster to facilitate immediate food distribution
Personnel Requirements	Coordination with OCD, Local DRRMC, Military, Department of Agrarian Reform (DAR), CMC Responders
Supplies Equipment	• Military transportation • NFA for rice, tents, kitchen utensils and bags etc. • Additional warehouse capacity, office space and accommodation with worst-case scenario • Agricultural production inputs, i.e., seeds, fertilizers, farm tools, fishing gears, fingerlings, livestock/poultry
Partnership Arrangements	DSWD, DA, DENR, DAR, Municipal Agricultural Offices Private partnership development
Coordination Arrangements	More frequent meeting of Food cluster, if more people are involved Involvement in Joint Needs Assessment
Budget requirements	For every 10,000 families displaced, 2,560 MT of mixed commodities (rice, beans, oil) will be required per month (per UN-OCHA recommendation)
Preparedness Activities	• Build capacity of local stakeholders in food production • Undertake a comprehensive analysis of lessons learned from the twin tragedies of the 7.2M earthquake and Super Typhoon Yolanda in 2013 • Identify local suppliers of fortified food • Build inventory and master listing of possible humanitarian partners including government institutions • Develop coordination mechanisms with humanitarian organizations and local authorities, i.e., transportation equipment, warehousing and management of food commodities including stockpiling • Adopting the best practices for climate change adaptation: climate field schools, diversified farming system and organic farming, decision tools for agricultural operations

7.7 Health Cluster

Health Cluster	
Cluster Scenario Assumption	*Worst Case* • 25,000 individuals affected by strong winds; 7,000 individuals affected by flashfloods; 4,000 individuals affected by fire; and, 36,000 individuals affected by tsunami or storm surge; 500,000 affected by a major earthquake, liquefaction, and landslides
Cluster Response Objectives	• Ensure availability and accessibility of quality healthcare services (physical, mental, psychosocial, RH) for those in ECs and IDPs in host Communities • Prevent and control outbreaks of communicable diseases • Prevent maternal and neonatal mortality and morbidity and unplanned pregnancies especially among adolescents • Establish and conduct disease surveillance in ECs and host communities • Ensure provision of acute medical and surgical care in local health facilities • Prevent and manage cases of SGBV • Strengthen the referral system **RH** • Provide RH services to at least 75% of the affected population needing RH services • Prevent/reduce maternal and neonatal mortality and morbidity • Reduce transmission of STIs/HIV-AIDS • Prevent sexual violence and other forms of GBV and assist survivors of sexual violence/GBV • Provide medical services to survivors of sexual violence/GBV
Response Plan	• Conduct joint assessments • Mobile teams and health services • Health outposts in ECs • Augment resources (HR, medicines, supplies, equipment) of local health facilities (BHS, RHU, hospitals) • Intensify and strengthen Information, Education, Campaign (IEC) on health • Organize surveillance team • Establishment of a Health Emergency Management System (HEMS) Operation Center • Installation of Rubb Hall Tents in damaged Hospitals • Installation of advance Medical Post in appropriate hospitals • Provision of 5KVA Generator to hospitals • Provision of medicines, medical supplies and other medical relief items to hardest-hit hospitals • Psychosocial Support in affected municipalities • Distribution of Hygiene kits • Monitoring of patient cases and facility in different hospitals • Conduct of Medical and Relief Missions • Conduct of Disease Surveillance and Mental Health Training • Support to vaccination campaign to priority municipalities

Health Cluster	
	• Conduct of Disease Surveillance and Mental Health Training • Provision of cold chain equipment to RHUs • Provision of Mobile Clinic and Psychosocial support and health promotions and relief to hardest hit municipalities • Supplementary immunization activities in high risk barangays
Personnel Requirements	• Assessment team- 1 per municipality • Health outpost- 1 nurse, 1 midwife, 2 BHWs, 1 sanitary inspector • Mobile team- 2 mobile teams/province; composed of 1 Doctor, 1 Nurse, 2 • Midwives, 1 Driver • Cluster coordination- 1 cluster coordinator/municipality • Information management officer- 1/municipality • Admin/finance/logistics- 1/municipality • Doctors, nurses and midwives will augment local health capacity per municipality • Surge support from mental health specialists an psychosocial support providers
Supplies Equipment	• Emergency kits (2), Trauma (13), Basic IEHK, (2) Surgical, • Health Post kit (10) • Cadaver Bags (5,000) • Rapid Diagnostic Kits- Leptospirosis, Dengue, Typhoid Fever, Cholera Test Kits, Transport medium- 500 kits • Water disinfectant- Aquatabs, Hyposol- 50,000 • Various medicines, supplies, equipment (good for 80%) • SPEED infrastructure • Office supplies/equipment • Speed boat and light sea craft • Life vests **RH** • RH kits • 25,000 hygiene/dignity kits • 25,000 teen kits • Medicines and supplies for the conduct of RH medical missions for 3 months (3 missions/week x 3 months x 3 teams)
Partnership Arrangements	With local/international NGOs, faith based groups, civil society, professional organizations, DOH, LGU **RH** • DOH and DSWD • Referral facilities • Local Government Units (LGUs) • Humanitarian consortium • IDPs and host communities • Private sector • Faith-based groups

Health Cluster	
Coordination Arrangements	PHO as lead agency for the Health Cluster with WHO as co-lead Intra and inter-cluster meetings (Health/MHPSS providers) **RH** • DOH is the cluster lead of RH Sub-cluster, with UNFPA acting as co-lead • Regular RH sub-cluster meetings • Regular Health cluster meetings
Budget requirements	• To be determined
Preparedness Activities	• Conduct training sessions on disaster management, preparedness, and basic life support • Mapping of prospective allied groups • Facility mapping/inventory per province of health facilities including service • capacities (physical and professional) • Hazard mapping per province • Conduct preparatory cluster meetings regularly • Review existing DRRM plan • Identify possible sources of assistance both financial and technical • Conduct orientation on disaster preparedness and response at the local level • Organize community response team (Community Health Team/barangay) • Training on Syndromic Management of Diseases, detection of nutritional problems, MUAC and RH health, Health Education • Training to local health workers on data gathering and reporting through SPEED • Adopting the best practices for Health: surveillance systems for climate-sensitive diseases, IEC on health impacts, and EWS • Strengthening of the provincial and municipal level referral system for mental health • Capacity building for municipal health officers on mental health in primary care settings

7.8 ICT / CwC Cluster

Information Communication and Technology (ICT)/ Communication with Communities (CwC) Cluster	
Cluster Scenario Assumption	*Worst Case* • Total power outage in the whole province • Breakdown of communication networks • Social unrest
Cluster Response Objectives	• Restoration of social order through communication • Communication with communities for safety and proper guidance

Information Communication and Technology (ICT)/ Communication with Communities (CwC) Cluster	
Response Plan	• Immediate dissemination of information, warnings, advices to the people by means of print, broadcast, electronic means
Personnel Requirements	• EDCom staff • Information officers of national government agencies and local government units
Supplies Equipment	• Cellphones, laptop computers, chargers, batteries for charging • Transistor radios with batteries, video/voice recorders • IEC materials
Partnership Arrangements	• Local and national radio and TV stations • Philippine Information Agency
Coordination Arrangements	• Municipal DRRM Councils and Officers, MPDCs, Municipal Information Officers
Budget requirements	• To be determined
Preparedness Activities	• Information, education, and communication (IEC) activities to MDRRMCs on the importance of DRRM/CCA to local development planning process • Training on DRRM/CCA including the preparation of MDRRM Plans • Training on Database Management to LGUs • Intensive IEC campaign on disaster preparedness to be prepared by the PDRRMC for dissemination to all puroks and schools with regular radio plugging in all local radio stations • The PGBh, in coordination with the MGB, PHIVOLCS, and other related agencies s to update and communicate its geohazard maps to include multiple hazards, early warning systems and other support infrastructures to improve the Province's capacity to reduce risks.

7.9 Infrastructure Cluster

Infrastructure Cluster (Roads, Bridges, Water, Energy, Communications, Ports, Irrigation, Government Facilities and Structures)	
Cluster Scenario Assumption	• *Most likely*: partially destroyed roads, bridges, intermittent power outages, lack of water supply for drinking • *Worst case:* all roads and bridges destroyed, disruption of transportation mobility, total power outage, no water supply for drinking and irrigation, government structures and facilities destroyed
Cluster Response	• To immediately repair major roads and bridges in coordination with the

Infrastructure Cluster (Roads, Bridges, Water, Energy, Communications, Ports, Irrigation, Government Facilities and Structures)	
Objectives	Department of Public Works and Highways (DPWH) • To coordinate with water and power companies for the immediate provision of light and water to the affected communities • To coordinate with communication networks in restoring communication lines in the province • To coordinate with the Philippine Ports Authority (PPA) and the National Irrigation Authority in restoring the ports and irrigation facilities
Response Plan	• Conduct immediate inspection and evaluation of damaged infrastructures by local building officials and expert engineers • Preparation of detailed damage reports • In coordination with government and private agencies, conduct immediate repair and restoration of major roads, bridge, water, electricity, communication networks, ports, and irrigation facilities • Debris management
Personnel Requirements	• DANA team composed of structural/ civil engineers and other technical staff • Planning and Programming Team to prepare Program of Works/Cost Estimates for repair/rehabilitation/reconstruction works • Operators of heavy and light equipment • Provincial Engineer's Office field supervisors and personnel • Municipal Engineers and staff or Local Building Official • Cluster coordination- 1 cluster coordinator/municipality • Information management officer- 1/ municipality • Admin/finance/logistics- 1/ municipality
Supplies Equipment	• Light and heavy equipment with drivers • Construction materials
Partnership Arrangements	• DPWH, Municipal Engineers, Local Building Officials
Coordination Arrangements	• Frequent cluster meetings • Inter-cluster meetings
Budget requirements	• To be determined
Preparedness Activities	• Conduct training on Structural Safety Assessment • Installation of independent/stand-alone power sources for pumping units of water providers • Regular monitoring and inspection of roads, bridges, and other infrastructures and facilities for possible retrofitting/ improvement • Preparation of disaster-resilient and climate-smart designs/materials for infrastructure projects • Formulation of a Bohol Energy Development Plan • Formulation of a Bohol Water Development Plan

Infrastructure Cluster (Roads, Bridges, Water, Energy, Communications, Ports, Irrigation, Government Facilities and Structures)	
	• Review and update the Provincial Road Network Development Plan • Review and update the Bohol Information System Strategic Plan • Review and update the Post-Great Bohol Earthquake Rehabilitation Plan • Review and update the Comprehensive Land Use Plan • Review and update the Zoning Ordinance • Review and update the transportation, and mobility plans. • Prepare an Evacuation Plan, which should designate at least one square meter per person of evacuation space in international standards. Tagbilaran City and other large coastal towns should have evacuation sites of at least ten (10) hectares each, and every evacuation area should be fitted with facilities required by the land use policy: emergency clinics, water and food stations, emergency shelters and telecommunication centers, and an emergency helipad including sanitation facilities. • Lobby with the National Government and the National Grid Corporation of the Philippines (NGCP) for the establishment of Bohol-Cebu power interconnection • Passage of a resolution/ordinance by the Sangguniang Panlalawigan specifying the strategic provincial policies on disaster risk reduction and climate change adaptation especially on the design and plan for both vertical and horizontal structures, which shall be in accordance with the hazard risk management policies, to wit: i. Avoid permanent development within and adjacent to areas vulnerable to hazards. ii. Design of buildings and other infrastructure development shall consider the long term effect. iii. Establish protection zone to buffer the works during construction stage. iv. Promote integration of hazard maps with infrastructure development.

7.10 Livelihood Cluster

Livelihood Cluster	
Cluster Scenario Assumption	• *Most likely*: destroyed telecommunication infrastructures • *Worst case:* all telecommunication infrastructures and facilities destroyed,
Cluster Response Objectives	• Damage Assessment and Needs Analysis (DANA) (crops, livestock, fisheries, sources of food/products) • Salvage damages to agriculture • Provide temporary or immediate livelihood or employment to affected families or individuals

Livelihood Cluster	
Response Plan	• Distribute fishing gears, assorted vegetable seeds, tilapia fingerlings and livestock to respond to the needs of affected communities • Send letters to banks and microfinance organizations appealing for the moratorium of interests, amortizations, and penalties of borrowed financial support for farmers • Conduct of veterinary mission in areas where farm animals were stressed during the earthquake • Conduct of Skills Training and Emergency Employment Towards Recovery (STEER) • Giving of jobs through the Bohol Emergency Employment Project (BEEP) • Cash-for-Work Programs
Personnel Requirements	• Bohol Employment and Placement Office staff • Office of the Provincial Agriculturist staff • Office of the Provincial Veterinarian Staff • Department of Labor and Employment
Supplies Equipment	• Fishing gears • Assorted vegetable seeds • Tilapia fingerlings and livestock for dispersal
Partnership Arrangements	• Private companies • Recruitment agencies • National government agencies
Coordination Arrangements	• Frequent cluster meetings • Inter-cluster meetings
Budget requirements	• To be determined
Preparedness Activities	• Preparation of project proposals for disaster-resilient and climate-smart livelihood for individuals/families affected by natural or man-made disasters and climate-change impacts • Preparation of appropriate shelter designs for disaster victims • Continuous raising of tilapia fingerlings, livestock and seedlings for dispersal

7.11 Logistics Cluster

Logistics Cluster	
Cluster Scenario Assumption	• *Most Likely* Donations received from local and international organizations • *Worst Case* No donations received because of a national or regional calamity
Cluster Response Objectives	• Establish transparency, accountability, and responsibility in handling donations and funds for calamities • Wise use of scarce resources by prioritizing aid to the most affected individuals/families/communities and timely purchase/distribution of relief goods
Response Plan	• Prepare and publish report on donations (in cash or in kind)

Logistics Cluster	
	• Secure the list of priority individuals/families/communities from the DSWD, LGUs and other agencies as basis for budgeting and allocating of cash and goods for immediate relief • Provide a forum for information sharing, identifying (potential) bottlenecks and operational support • Managed shared warehousing facility • Prioritize goods based on identified humanitarian priorities • Deploy Logistics Response Team • Create logistics hubs
Personnel Requirements	• Provincial Treasurer's Office, Provincial Budget Management Office, Provincial Accountant's Office, Provincial Internal Audit Office
Supplies Equipment	• Trucks, warehouses, air assets • Computers
Partnership Arrangements	• Logistics officers from other agencies
Coordination Arrangements	• Information sharing across clusters • Regular cluster meetings
Budget requirements	• To be determined
Preparedness Activities	• Update and share Logistics Capacity Assessment in inter-agency format • Identify logistics contacts in other humanitarian agencies • Conduct a general assessment of logistics requirements • Urge the Congress and Senate to pass a bill that sets the criteria in prioritizing disaster–affected provinces, municipalities and barangays in the release of Peoples' Survival Fund (PSF) to make affected communities bounce back faster from the disasters. • Sectoral Plans to be prepared/updated in the future, with corresponding budget: ➢ **Productive Lives**: Livelihoods (crops, livestock, fisheries, employment, sources of food, products), Shelter and Settlements, and Education ➢ **Healthy Lives**: Health and Water, Sanitation and Hygiene (WASH) ➢ **Protected Lives**: Disaster Risk Reduction (DRR), Restoring and Protecting the Environment, and Protection and Vulnerable Groups

7.12 Nutrition Cluster

Nutrition Cluster	
Cluster Scenario Assumption	*Worst Case:* Widespread malnutrition
Cluster Response Objectives	• To reduce malnutrition of children under-five and lactating mothers through the provision of Therapeutic Feeding Program (TFP) and Supplementary Feeding Program (SFP) • Prevent deterioration of nutrition status
Response Plan	• Establish nutrition and education program • Establish school feeding programs, including feeding programs at

Nutrition Cluster	
	health institution • Distribution of assorted vegetable seeds and monitoring if seeds were planted • Nutrition surveillance system • Information dissemination to LGUs in relation to Nutrition cluster • Facilitate the School Milk Feeding Program sponsored by NDA • Assessment of nutritional status of preschool children through taking of height and weight and MUAC • Distribution of iron-folic acid tablets to pregnant and lactating women • Roll out of CMAM Training to hardest municipalities • Nutrition in emergencies • Treatment of acute malnutrition • Campaign for breastfeeding • Distribution of F75 and F100 • Distribution of RUTF to identified Outpatient SAM • Insumix feeding • Field medical mission, prenatal check-up, post-natal check-up
Personnel Requirements	Surge support with Nutrition specialists , preferably graduates of BS Nutrition and Dietetics; health service providers trained in treatment of severe malnutrition at referral hospital
Supplies Equipment	Cooking set and supplementary food for 10,000 children Iron-folic acid tablets and micronutrient supplement for children and adults MUAC Tapes, Weighing scales, Height boards IEC/Advocacy materials
Coordination and Partnership Arrangements	DOH taking the cluster lead, with support from DSWD and other stakeholders Synchronized and/or joint cluster meetings with Health cluster, as required
Budget requirements	Subject to assessed needs of the affected populations
Preparedness Activities	• Identify vulnerable population through nutritional assessment • Baseline data of school children • Training in Nutrition in Emergencies by DOH-Health Emergency Management Staff • Explore appropriate technology for sustainable solutions (e.g. Bio-Intensive Gardening in ECs) for return and relocation areas and for CFS

7.13 Protection Cluster

Protection Cluster	
Cluster Scenario Assumption	• *Most likely*: natural or man-made disasters cause major displacements of up to 100,000 individuals • *Worst case:* natural or man-made disasters cause major displacements

Protection Cluster	
	of up to 500,000 individuals
Cluster Response Objectives	• To identify and establish a monitoring body that will assess, verify, document and report and respond on protection issues and concerns • To ensure proper coordination with other concerned government agencies and other stakeholders in order to respond accordingly.
Response Plan	a. Give protective response in accordance to gender-based violence and child protection sub-cluster b. Establish child-friendly spaces (CFS), temporary learning spaces (TLS) cum temporary classrooms. c. Conduct rapid child protection mission and assessment in the affected areas d. Establish Kids Camp for 3 days in affected areas e. Conduct Family Tracing and Reunification and referral pathways f. Review of Child Protection Rapid Assessment (CPRA) tool g. Set-up women friendly space in strategic municipalities h. Psychosocial support for traumatized women and improved medical management of cases of sexual violence. i. Provision of security through roving police patrols j. Conduct Training on the following: • Child Friendly Spaces for facilitators and service providers • Women-Friendly Space to LCE and MSWDOs • PsychoSocial Support Service (PSS) for caregivers • Preparedness Training on Disaster Risk Reduction & Management • Women and Children Protection Training • Child Rights and Child Protection • Enumerators who will conduct the CPRA in the target areas
Personnel Requirements	• Social workers and protection staff with local language skills
Supplies Equipment	• Training materials, IEC/Advocacy materials on SGBV • Post-rape kits • Protection manuals • Vehicles with drivers
Partnership Arrangements	• Each cluster member reports on protection concerns to the cluster • Each cluster member maintains its own arrangements with implementing partners
Coordination Arrangements	• Regular reporting to and from other clusters and protection sub-working groups • Frequent cluster meetings
Budget requirements	• To be determined
Preparedness Activities	• Emergency preparedness planning for children and families • Information dissemination on prevention and response to child abuse,

Protection Cluster	
	exploitation, violence and child trafficking. • Strengthen Local Councils for the Protection of Children, and Anti-Trafficking Task Forces. • Orientation of social workers, camp managers, service providers, law enforcers, humanitarian workers, volunteers on the code of conduct in humanitarian work. · • WFS for gender-based violence (GBV) counselling and to raise awareness of GBV and women's rights. • Support for day-care centers through sufficient funding and training of personnel. • Agree on SGBV SOP and Referral Pathway • Raise IDPs' awareness about SGBV • Capacity-building on Minimum Initial Service Package (MISP) / Protection for service providers

7.14 Shelter Cluster

Shelter Cluster	
Cluster Scenario Assumption	• *Most likely*: destroyed telecommunication infrastructures • *Worst case:* all telecommunication infrastructures and facilities destroyed
Cluster Response Objectives	• Provide temporary shelter and comfort to the displaced families • Work for a permanent resettlement or relocation site to affected or displaced families
Response Plan	• Identify displaced families/individuals • Assessment of damaged houses and properties • Shelter and reconstruction plan • Permanent resettlement or return to homes of affected and displaced households • Validation of beneficiary data for the construction phase • Distribution of tarps and tents to families with damaged houses • Disseminate Shelter Standards, material kit guidance, beneficiary selection criteria • Distribution of IEC materials on debris management
Personnel Requirements	• Provincial Engineer's Office staff • Office of the Provincial Social Welfare and Development staff
Supplies Equipment	• IEC materials • Vehicle • Load for cellphones • Material kit guidance • Shelter standards brochure

Shelter Cluster	
Partnership Arrangements	• DPWH, DSWD, NHA, • Structural Engineers, Architects
Coordination Arrangements	• Weekly cluster meetings • Inter-cluster coordination meetings • Coordination with Shelter Cluster partners on general shelter issues (building permits, hazard zones, relocation, temporary shelter vs. progressive core house, etc.)
Budget requirements	• To be determined
Preparedness Activities	• Formulation of criteria for beneficiaries of shelter program • Formulation of grievance mechanism • Information management training • Identification of Shelter Focal Point persons per municipality • Training on structural damage assessment • Training on designing climate-smart and disaster-resistant buildings

7.15 WASH Cluster

Water, Sanitation, and Hygiene (WASH) Cluster	
Cluster Scenario Assumption	*Most likely* A 7-magnitude earthquake or Super Typhoon damages 20 municipalities with 100,000 affected individuals *Worst case* An 8-magnitude earthquake with liquefaction or Super Typhoon with landslides wrecks all 47 municipalities and the City of Tagbilaran
Cluster Response Objectives	*Most likely* • To assist at least 50% of the affected population • To provide safe drinking water and to provide sanitation facilities • To ensure stockpiles of WASH supplies for 50% of affected population *Worst* • To conduct WASH survey to 250,000 affected individuals • To provide safe drinking water to 250,000 individuals
Response Plan	*Most likely* • Establish WASH team in the province (PRC, PHO and DOH) *Worst Case* • Organize a unified WASH team (RHU and DOH) • Provision of sanitary facilities to schools and evacuation camps • Sustainable access to safe drinking water • Provision of hygiene kits and portable toilets • Monitoring of water sources

Water, Sanitation, and Hygiene (WASH) Cluster	
Personnel Requirements	• Current personnel capacity for *most likely scenario* – health staff, including • Barangay Health Workers (BHWs), PDRRMCs, MDRRMCs, Red Cross • Surge support, activation of DOH-led WASH team for *worst case scenario*
Supplies Equipment	*Most likely* • Water storage facilities and trucking services • Water treatment unit, water tanks, hand pumps, water pumps • Maintenance tools (water supply system and sanitation facilities) • Diarrheal disease kits (c/o WHO) • Toilet and bathing cubicles • Water testing kits, hygiene kits • Garbage bins distribution • Installation of water pumps, bladder/tank/tap stand • Installation of emergency and temporary communal latrine • Bottled water distribution
Partnership Arrangements	• Most WASH cluster members have existing partners (local NGOs, community-based organizations) • National government agencies • Private sector/civil society organizations
Coordination Arrangements	Schedule meetings and assessment to enhance WASH facilities
Budget requirements	*Most Likely* PHP 37 M (100,000/individual x P25,000) *Worst Case* PHP 1 B (500,000/individual x P2,000)
Preparedness Activities	• Establishment and organization of WASH team • Training and seminar for individuals • Stockpile of hygiene kits, water purifying tables and water kits for household level treatment • Continue to install WASH facilities (hand pumps, dug wells, spring development, deep tube wells, pit latrines, bathing cubicles, wash stands) • Orient and train local health workers, hygiene promoters, sanitary inspectors and other LGU staff in WASH in emergencies • Map capacities of Cluster members • Adopting the best practices for water resources: rainwater collection, rational water management

8. IMPLEMENTING PREPAREDNESS

The level of calamity fund to the cost of damage presents a real enormous financing gap. Moreover, the limited financial resources are channeled to reconstruction and rehabilitation, rather than meeting the backlog in basic services. Therefore, disasters erode the province's development gains. They do not only result to economic losses but also affect development and vice-versa. Inappropriate development also leads to greater disaster risks. The poor siting or location of settlements, economic activities and infrastructures, inappropriate use of resources and rapid urban growth exert pressure resulting to further degradation to the environment and spawn more vulnerable communities.

In the event of calamities due to natural hazards, vulnerable communities may not be able to cope, which will result in a disaster that will eventually lead to risk accumulation and bigger losses. Bohol's preparedness to forthcoming disasters is shown in Table 13 which represents the existing facilities and services in the province through its Provincial, City and Municipal Disaster Risk Reduction and Management Councils.

Table 13 . Disaster Preparedness Services and Facilities

Type of Services/Facilities	Name of Organization	Location
Search and Rescue Unit (SAR)	▪ Bohol Outdoors Explorer Club, Inc. (BOEX) ▪ Tagbilaran City Emergency Response Operating Team (TECEMROT) ▪ Divine Word Outdoors Club (DWOC) ▪ Philippine Red Cross (PRC)	Tagbilaran City
Evacuation Centers	All provincial, city and municipal evacuation centers under its Disaster Risk Reduction and Management Councils (DRRMCs) in Bohol	Province-wide
Relief Unit	▪ All provincial, city and municipal evacuation center under its DRRMCs in Bohol ▪ Office of the Provincial Social Worker and Development	Province-wide
Fire Suppression	All provincial, city and municipal Fire Suppression unit under its DRRMCs in Bohol, Bureau of Fire Protection (BFP)	Province-wide
Emergency Medical Services	▪ TaRSIER 117 ▪ Tagbilaran City Emergency Response Operating Team (TECEMROT) ▪ All government and private-owned hospitals	Tagbilaran City Province-wide
Transportation Services	All Provincial, City and Municipal DCCs in Bohol	Province-wide

Source: Office of the Civil Defense (OCD) 2009

Among all the types of services/facilities throughout the province, only the Search and Rescue and Emergency Medical Services have no counterpart in the municipal level. All municipalities need to develop their own Search and Rescue units in cooperation with the more experienced BOEX, TECEMROT, DWOC and PRC. For the EMS, it would be better if the Rural Health Units of each and every municipality is properly trained for emergency medical services.

Herein below is the minimum set of priority actions for disaster preparedness:

- Gathering baseline disaggregated data
- Training on the cluster approach
- Identifying local implementing partners in the Central Visayas or at the LGU level
- Resource positioning
- Pre-agreed evacuation sites
- Advocacy and actions for use of 5 per cent budget for emergency preparedness and response
- Understanding common standards for assessment
- Developing common understanding of highly vulnerable communities
- Mechanisms to promote sustainable peace and security
- Monitoring early warning indicators based on triggers
- Actions upon activation/timeline of actions
- Process for regular review of the contingency plan
- Simulation or testing of the contingency plan