MDRRM-CCA PLAN 2013-2016

Municipality of JAGNA

MDRRMC

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SB Resolution Adopting the MDRRM-CCA Plan 2013-2016 of LGU Jagna

Republic of the Philippines
Province of Bohol
MUNICIPALITY OF JAGNA
Office of the 8th Sangguniang Bayan

A RESOLUTION ADOPTING THE MUNICIPAL DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION (MDRR-CCA) PLAN FOR 2013-2016 OF LGU-JAGNA.

PRESENT:

Hon. Bonifacio J. Virtudes, Jr.	- Municipal Vice Mayor - Presiding
Hon. Bonifacio Go Virtudes, Sr.	- Municipal Councilor
Hon. Maricris V. Jamora	- Municipal Councilor
Hon. Rodrigo B. Lloren	- Municipal Councilor
Hon. Derrick C. Virtudazo	- Municipal Councilor
Hon. Leonardo A. Ocio, Jr.	- Municipal Councilor
Hon. Alberto A. Cabrestante, Jr.	- Municipal Councilor
Hon. Cesario M. Cagulada	- Municipal Councilor
Hon. Arnoldo D. Pielago	- Municipal Councilor
Hon. Cirilo C. Acedo	- Ex-Officio Member (LnB Pres.)
Hon. Jessyl M. Jalop	- Ex-Officio Member (SKMF Pres.)

Adopted: August 27, 2013

RESOLUTION NO. 16-08-2013

WHEREAS, the Philippines as an archipelago country within the Pacific ring of fire, is in a particular vulnerable situation as manifested by an increasing incidence of calamities in the past years being in the top most vulnerable countries in terms of disasters and calamities;

WHEREAS, Participatory Capacity and Vulnerability Assessment (PCVA) and Mines and Geosciences Bureau (MGB) region-VII conducted a joint geo-hazard assessment in Jagna, and the result of the MGB Rapid Field Assessment, Jagna has the possibility of experiencing multiple hazards such as tsunami, rain induced landslide, storm, and liquefaction, flooding and ground shaking hazards;

WHEREAS, the local government units (LGU's) are mandated through Republic Act. No. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010 to adopt and implement a coherent, comprehensive, integrated, efficient and responsive disaster risk reduction and management program;

WHEREAS, LGU-Jagna has undergone and conducted a Municipal Disaster Risk Reduction and Management planning workshop that formulate a plan for necessary disaster preparation and proper fund utilization;

WHEREAS, the Municipal Disaster Risk Reduction Management Council (MDRRMC) has adopted a resolution for the Sangguniang Bayan to adopt the Municipal Disaster Risk Reduction and Climate Change Adaptation Plan for 2013-2016;

WHEREFORE:
Be it resolved by the 8th Sangguniang Bayan
in session duly assembled...

"TO ADOPT THE MUNICIPAL DISASTER RISK REDUCTION AND CLIMATE CHANGE ADAPTATION (MDRR-CCA) PLAN FOR 2013-2016 OF LGU-JAGNA".

RESOLUTION NO. 16-08-2013
8th Sangguniang Bayan
Jagna, Bohol

August 27, 2013
Regular Session

AFFIRMATIVE:

BONIFACIO GO VIRTUDES, SR.
Municipal Councilor

MARICRIS V. JAMORA
Municipal Councilor

RODRIGO B. LLOREN
Municipal Councilor

DERRICK C. VIRTUDAZO
Municipal Councilor

LEONARDO A. OCIO, JR.
Municipal Councilor

ALBERTO A. CABRESTANTE, JR.
Municipal Councilor

CESARIO M. CAGULADA
Municipal Councilor

ARNOLDO D. PIELAGO
Municipal Councilor

CIRILO C. ACEDO
Ex-Officio Member (LnB Pres.)

JESSYL M. JALOB
Ex-Officio Member (SKMF Pres.)

NEGATIVE None

ABSENT: None

OFFICIAL BUSINESS:

CERTIFIED TO BE DULY ADOPTED:

BONIFACIO J. VIRTUDES, JR.
Municipal Vice Mayor
Presiding

ATTESTED:

RENATO R. ACERA
SB Secretary

NOTED:

ATTY. FORTUNATO R. ABRENILLA
Municipal Mayor

Disaster Risk Reduction and Management and Climate Change Adaptation Plan Municipality of JAGNA

Background and Rationale

Preliminaries

Recognizing the high disaster risk of the municipality of Jagna, the members of the Municipal Disaster Risk Reduction Management Council (MDRRMC) have initiated the development of a Disaster Risk Reduction Management Plan and Climate Change Adaptation (DRRM-CCA) Plan to guide the integration of a risk reduction agenda into on-going governance and ensuring sustainable development and poverty reduction in aligning the vision of the municipality to become a progressive center of development and economic services in South eastern Bohol.

Jagna has a total population of 32,034 is considered as one of the environmentally constrained areas prone to natural hazards like flooding, earthquake, rain-induced landslide, tsunami and liquefaction based on the rapid and community assessment conducted by PHIVOLCs and OCD under the READY project in February 2007, the municipality of Jagna is susceptible to some disaster and hazard risks. Among them are rain-induced landslide, storm surges, tsunami, liquefaction, flooding and ground shaking hazards. This assessment maybe one of the reason that LGU Jagna is one of the chosen pilot area in mainstreaming disaster risk reduction management and climate change adaptation nationwide.

Mines and Geosciences Bureau – Region VII also conducted a field geo-hazard assessment of landslide and flood prone barangays in Jagna and the result of the MGB Rapid Field Assessment is as follows:

1. There are five (5) barangays with high landslide susceptibility (Barangays Mayana, Malbog, Calabacita, Tubod Monte and Boctol).
2. There are seven (7) barangays with moderate landslide susceptibility (Barangays Balili, Buyog, Cantuyoc, Odiong, Alejawan, Canjulao and Kinagbaan).
3. There are twenty-one (21) barangays with low landslide susceptibility (Barangays Bunga Mar, Lonoy, Cambugason, Can-ipol , Cabungaan, Laca, Bunga Ilaya, Naatang, Tubod Mar, Larapan, nausok, Pangdan, Tejero, Poblacion, Looc, Pagina, Can-upao, Cantagay, Ipil, Faraon and Can-uba).
4. There are nine (9) barangays that are susceptible to flooding (Barangays Bunga Mar, Poblacion, Tejero, Looc, Pangdan, Kinagbaan, Cambugason, Lonoy and Alejawan).

Approach and methodologies

The old approach to disaster management was characterized by a focus on giving assistance or intervention during or immediately after disaster. There was heavy reliance on physical and engineering solutions directed at predicting, modelling and modifying natural hazards. Under the new approach there is as much attention given to hazards as to vulnerabilities and capacities

of people and places. There is now greater emphasis on varying exposure levels of population groups living in poorly constructed buildings, incorrectly sited developments, informal settlements and inadequately provided open space.

Stated simply, the national DRRM framework involves s systematic analysis of the risk factors (hazards and exposures),reducing the vulnerabilities and increasing the capacities of the elements at risk, and mainstreaming these efforts in the policy making, planning and implementation process in all levels from national to local, aimed at achieving the vision of " safer, adaptive and disaster-resilient Filipino communities towards sustainable development" (See Figure 1.)

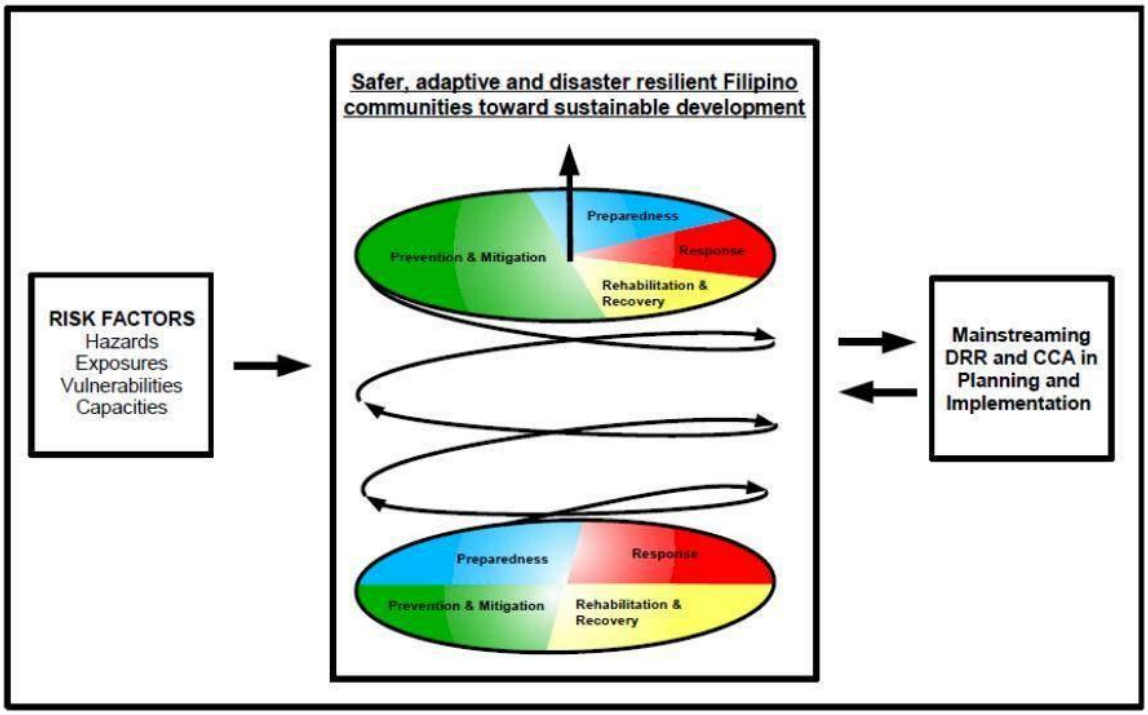


Figure 1. The National DRRM Framework

Useful concepts and terms (RA 10121 and RA 9729)

Adaptation – the adjustment in natural human systems in response to actual or expected climatic stimuli or their effects which moderates harm or exploits beneficial opportunities.

Capacity – a combination of all strengths and resources available within a community, society or organization that can reduce the level of risk or effects of a disaster. Capacity may include infrastructure and physical means, institutions, societal coping abilities, as well as human knowledge, skills and collective attributes such as social relationships, leadership and management. Capacity may also be described as capability.

Civil Defense – disaster preparedness and prevention activities, other than military actions, geared towards the reduction of loss of life and property brought about by natural and human-induced disasters. Civil Defense may also be referred to as Civil Protection.

Civil Society Organizations **(CSOs)** - non-state actors whose aims are neither to generate profits nor to seek governing power, CSO's unite people to advance shared goals and interests. They have a presence in public life, expressing the interests and values of their members or others, and are based on ethical, cultural, scientific, religious or philanthropic considerations. CSO's include non-government organizations NGO's), professional associations, foundations, independent research institutes, community-based organizations (CBO's), faith-based organizations, people's organizations, social movements, and labor unions.

Climate Change – a change in climate that can be identified by changes in the mean and/or variability of its properties and that persists for an extended period typically decades or longer, whether due to natural variability or as a result of human activity.

Community-Based Disaster Risk Reduction and Management **(CDRRM)** - a process of disaster risk reduction and management in which at risk communities are actively engaged in the identification, analysis, treatment, monitoring and evaluation of disaster risks in order to reduce their vulnerabilities and enhance their capabilities, and where the people are at the heart of decision-making and implementation of disaster risk reductions and management activities.

Complex Emergency - a form of human-induced emergency in which the cause of the emergency as well as the assistance to the afflicted is complicated by intense level of political considerations.

Contingency Planning - a management process that analyzes specific potential events or emerging situations that might threaten society or the environment and establishes arrangements in advance to enable timely, effective and appropriate responses to such events and situations.

Disaster - a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. Disasters are often described as a result of the combination of the exposure to a hazard; the condition of vulnerability that are present; and insufficient capacity or measures to reduce or cope with the potential negative consequences. Disaster impacts may include loss of life, injury, disease and other negative effects on human, physical and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation.

Disaster Mitigation - the lessening or limitation of the adverse impacts of hazards and related disasters. Mitigation measures encompass engineering techniques and hazard-resistant construction as well as improved environmental policies and public awareness.

Disaster Preparedness - the knowledge and capacities developed by governments, professional response and recovery organizations, communities and individuals to effectively anticipate, respond to and recover from, the impacts of likely, imminent or current hazard events or conditions. Preparedness action is carried out within the content of disaster risk reduction and management and aims to build the capacities needed to efficiently manage all types of emergencies and achieve orderly transitions from response to sustained recovery. Preparedness is based in a sound analysis

of disaster risk and gook linkages with early warning systems, and includes such activities as contingency planning, stockpiling of equipment and supplies, the development of arrangements for coordination, evacuation and public information, and associated training and field exercises. These must be supported by formal institutional, legal and budgetary capacities.

Disaster Prevention – the outright avoidance of adverse impacts of hazards and related disasters. It expresses the concept and intention to complexly avoid potential adverse impact through action taken in advance such as construction of dams or embankments that eliminate flood risks, land-use regulations that do not permit any settlement in high-risk zones, and seismic engineering designs that ensure the survival and function of a critical building in any likely earthquake.

Disaster Response - the provision of emergency services and public assistance during or immediately after a disaster in order to save lives reduces health impacts, ensure public safety and meet the subsistence needs of the people affected. Disaster response is predominantly focused on immediate and short-term needs and is sometimes called "disaster relief".

Disaster Risk - the potential disaster losses in lives, health status, livelihood, assets and services, which could occur to a particular community or a society over some specified future time period.

Disaster Risk Reduction - the concept and practice reducing disaster risks through systematic efforts to analyze and manage the casual factors of disasters, including reduced exposures to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.

Disaster Risk Reduction and Management - the systematic process of using administrative directives, organizations and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster. Prospective disaster risk reduction and management refers to risk reduction and management activities that address and seek to avoid the development of new or increased disaster risks especially if risk reduction policies are not put in place.

Disaster Risk Reduction and Management Information System - a specialized database which contains among others, information on disaster and their human material, economic and environmental impact, risk assessment and mapping vulnerable groups.

Disaster Victims - persons or group of persons who have been adversely affected by a natural or human-induced hazard who have to leave habitual places of residence due to exiting or impending threats, damaged shelter units, with casualty among immediate family members of those who remained in their habitual places of origin when still habitable but whose main source of income or livelihood had been damaged and are experiencing hopelessness and difficulty in coping to the onslaught of the hazardous events on their own resources.

Early Recovery - multi-dimensional process of recovery that begins in a humanitarian setting. It is guided by development principles that seek to build on humanitarian programs and catalyze sustainable development opportunities. It aims to generate self-sustaining, nationally-owned, resilient process for post-crisis recovery. It encompasses the restoration of basic services, livelihoods, shelter, governance, security and rule of law, environment and social dimensions, including reintegration of displaced populations.

Early Warning System - the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organization threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss. A people-cantered early warning system necessarily comprises four (4) key elements: knowledge of the risks; monitoring, analysis and forecasting of the hazards; communication or dissemination of alerts and warning; and local capabilities to respond to the warning received. The expression "end-to-end warning system" is also used to emphasize that warning systems need to span all steps from hazard detection to community response.

Emergency - unforeseen or sudden occurrence, especially danger, demanding immediate action.

Emergency Management - the organization and management of resources and responsibilities for addressing all aspects of emergencies in particular preparedness, response and initial recovery steps.

Exposure - the degree to which the elements at risk are likely to experience hazard events of different magnitudes.

Geographic Information System - a database which contains among others, geo-hazard assessments, information on climate change, and climate risk reduction and management.

Hazard - a dangerous phenomenon, substance, human activity or condition that may cause loss of life, injury or other health impacts, property damage, los of livelihood and services, social and economic disruption or environmental damage.

Internally Displace Persons (IDPs) or Persons Displaced by the Disaster - are persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of natural or human-induced disasters, and who have not crossed an internationally recognized state border.

Land-Use Planning - the process undertaken by public authorities to identify, evaluate and decide on different options for the use of land, including consideration of long-term economic, social and environmental objections and the implications for different communities and interest groups, and the subsequent formulation and promulgation of plans that describe the permitted or acceptable uses.

Mitigation - structural and non-structural measures undertaken to limit the adverse impact of natural hazards, environmental degradation, and technological hazards and to ensure the ability of at-risk communities to address vulnerabilities aimed at minimizing the impact of disasters. Such measures include, but are not limited to, hazard-resistant construction and engineering works, the formulation and implementation of plans, programs, projects and activities, awareness raising, knowledge management, policies on land use planning, building and safety standards and legislation,

National Disaster Risk Reduction and Management Framework (NDRRMF) - provides for comprehensive, all hazards, multi-sectoral, inter agency and community based approached to disaster risk reduction and management.

National Disaster Risk Reduction and Management Plan (NDRRMP) - the document to be formulated and implemented by the Office of the Civil Defense (OCD) that sets out goals and specific objectives for reducing disaster risks together with related actions to accomplish these objectives. The NDRRMP shall provide for the identification of hazards, vulnerabilities and risks to be managed at the national level; disaster risk reduction and management approaches and strategies to be applied in managing said hazards and risks; agency roles; responsibilities and lines of authority at all government levels; and vertical and horizontal coordination of disaster risk reduction and management in the pre-disaster phases. It shall be in conformity with the NDRRMF.

Post-disaster Recovery - the restoration and improvement where appropriate, of facilities, livelihood and living conditions of disaster-affected communities, including efforts to reduce disaster risk factors, in accordance with the principles of "build back better".

Preparedness - pre-disaster actions and measures being undertaken within the context of disaster risk reduction and management and are based on sound risk analysis as well as pre-disaster activities to avert or minimize loss of life and property such as, but not limited to community organizing, training, planning, equipping, stockpiling, hazard mapping, insuring of assets, and public information and education initiatives. This also includes the development / enhancement of an overall preparedness strategy, policy, institutional structure, warning and forecasting capabilities, and plans that define measures geared to help at risk communities safeguard their lives and assets by being alert to hazard and taking appropriate action in the face of an imminent threat to an actual disaster.

Private Sector - the key factor in the realm of economy where the central social concern and process are the mutually beneficial production and distribution of goods and services to meet the physical needs of human beings. The private sector comprises private corporations, households and non-profit institutions serving households.

Public Sector Employees - all persons in the civil service.

Rehabilitation - measures that ensure the ability of affected communities / areas to restore their normal level of functioning by rebuilding livelihood and damaged infrastructure and increasing the communities' organizational capacity.

Resilience - the ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in timely and efficient manner, including through the preservation and restoration of its essential basic structure and functions.

Response - any concerted effort by two (2) or more agencies, public or private, to provide assistance or intervention during or immediately after a disaster to meet the life preservation and basic subsistence needs of those people affected and in the restoration of essential public activities and facilities.

Risk - the combination of the probability of an event and its negative consequences.

Risk Assessment - a methodology to determine the nature and extend of risk by analyzing potential hazards and evaluating existing conditions of vulnerability that together could potentially harm

exposed people, property, services, livelihood and the environment on which they depend. Risk assessments with associated risk mapping include: a review of the technical characteristics of hazards such as their location, intensity, frequency and probability; the analysis of exposure and vulnerability including the physical, social, health, economic and environmental dimensions and the evaluation of the effectiveness of prevailing and alternative coping capacities in respect to likely risk scenarios.

Risk Management - the systematic approach and practice of managing uncertainty to minimize potential harm and loss. It comprises risk assessment and analysis, and the implementation of strategies and specific actions to control, reduce and transfer risks. It is widely practiced by organizations to minimize risk in investment decisions and to address operations risks such as those of business disruption, production failure, environmental damage,social impacts and damage from fire and natural hazards.

Risk Transfer - the process of formally or informally shifting the financial consequences of particular risks from one party to another whereby a household, community, enterprise or state authority will obtain resources from the other party after a disaster occurs, in exchange for on-going or compensatory social or financial benefits provided to that other party.

Sustainable Development - development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two (2) key concepts: (1) the concept of "needs"' in particular the essential needs of the world's poor, to which overriding priority should be given, and (2) the idea of limitations imposed by the state of technology and social organizations on the government's ability to meet present and future needs. It is the harmonious integration of a sound and viable economy, responsible governance, social cohesion and harmony, and ecological integrity to ensure that human development now and through future generations is a life-enhancing process.

Volunteer - individual / person or group who for reasons arising from their socio-developmental, business and corporate orientation, commitment or conviction, contribute time, service, and resources whether full time or part time based to a just and essential social development cause, mission or endeavor in the belief that their activity is mutually meaningful and beneficial to public interest as well as to themselves.

Vulnerability - the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard. Vulnerability may arise from various physical, social, economic and environmental factors such as poor design and construction of buildings, inadequate protection of assets, lack of public information and awareness, limited official recognition of risks and preparedness measures and disregard for wise environmental management.

Vulnerable and Marginalized Groups - those that face higher exposure to disaster risk and poverty including, but not limited to, women, children, elderly, differently-abled people, and ethnic minorities.

1. Organization of the Plan

The formulation of the Municipal Disaster Risk Reduction Management Plan is conceptualized through better partnership and working relationships among the departments within the local government unit, civil society organization, private sectors and community disaster volunteers with the Technical Assistance Program supported by the Global Facility for Disaster Reduction and Recovery (GFDRR) managed by the WB. Prior to the suggested outline of DRRM Plan given by the WB-GFDRR the municipality has already draft a typical DRRM Plan based of the 5-Core program namely: disaster prevention, disaster mitigation, disaster preparedness and response program. The 33 barangays has also completed its BDRRM Plan in collaboration with our local non-government organization like the Bohol Integrated Development Foundation, (BIDEF) Inc.

The series of capacity building workshops on mainstreaming DRRM/CCA in all local planning systems and processes conducted by the WD-GFDRR and this implies that the DRRA/CCA plan is not intended to be stand-alone, self-executory plan for it is to be implemented it must form an integral part of local governance systems and processes. With the technical assistance of WD0GFDRR we are able to come up a uniform outline of content and from there we are able to revised our MDRRM plan based on the suggested outline.

Chapter 1. A Vision of Disaster Resilient Municipality of Jagna

The Vision Statement

Jagna is the leading center of trade, sustainable agro-processing and eco-tourism in southeastern Bohol, with self-reliant men and women living a better quality of life, preserving their cultural heritage and efficiently managing natural resources through good governance.

Indicators of Resilient Development Sectors

Economic Sector	• sufficiency in food and agricultural products • institutionalized sustainable farming systems • sustainable and viable livelihood and micro-enterprises • enhanced security of farmers as related to land tenure • Vibrant climate for economic opportunities
Social Sector	• Improved quality of life of the people in the municipality • Increased access to health care especially by the marginalized sectors • Improved academic performance and reading comprehension skills of the pupils in the public elementary school • Enhanced access to social welfare services by the disadvantaged groups • Improved public order and safety

Infrastructure	• Improved various infrastructure projects to support economic, environmental , development administration, and social goals
Environment	• Make the community environmentally-sound and responsive to climate change • Sustained, vibrant, and rich coastal and marine resources
Institutional	• GAD-oriented, morally upright, productive, and competent LGU officials and employees • Responsive and effective local legislation • Maximized collection of local revenues • Promotion of transparency and customer satisfaction

Vision-Reality Gap

Jagna is the leading center of trade, sustainable agro-processing and eco-tourism in southeastern Bohol, with self-reliant men and women living a better quality of life, preserving their cultural heritage and efficiently managing natural resources through good governance.				
VISION-REALITY GAP				
Indicators of "Disaster Resilient"	*Current Reality*	*Level of Attainment*	*Vision-Reality Gap*	*What to do to fill the gap*
Economic Sector				
promoting organic farming and ensuring environment friendly agro-processing	majority of the farmers uses inorganic inputs	3	7	continuing demo farming on organic farming, environment friendly, gender responsive technology for agro-processing
Social Sector				
organized and capacitated community-based volunteers in times of disasters and rescue operations	community-based volunteers not yet organized only the LGU initiated medical and rescue unit	3	7	to organize community-based volunteers and rescue teams,
vigilant citizens on possible danger and hazards in the locality	unaware of hazard risks in the area susceptible to landslide, flooding,tsunamis,earth quakes,etc.	4	6	capacitate thru conduct of trainings and drills
Environment Sector				
sustained practices of solid waste segregation policy and expand collection of residual and proper disposal	solid waste management program only covers urbanizing barangays	4	6	continuing development sanitary landfill sites and continuous social marketing on proper solid waste disposal
Ensured proper liquid and solid waste disposals of economic enterprises e.g. funeral parlor, poultries and pigeries, slaughter house, etc.	not compliant to standards and proper waste treatment and disposals	4	6	review of zoning regulations, coordination to concern agencies for monitoring and compliance to standards
Infrastructure				
constructed proper drainage and catchment basin system especially in lowland areas like Poblacion-Tejero	poor drainage system in-placed, no catchment basin, no sewerage and narrow exits of water	4	6	requires master planning on drainage and sewerage system in the low-land areas
Development Administration				
mainstreaming DRRM/CCA in all PPAs initiated by LGU	on-going mainstreaming in PPAs into the local planning systems and processes	5	5	integrating DRRM/CCA in all development plans in the LGUs

Chapter 2. Risk Assessment (Hazards, Vulnerability and Capacity Assessment)

VULNERABILITY AND CAPACITY ANALYSIS:

The table below describes the vulnerability of the community against the hazards that frequently visited the municipality and the capacity of the LGU and Community to resist the possible disasters that may happen. The Vulnerability and Capacity Analysis is examining the three parameter 1) Physical and Material Aspect; 2) The Social and organizational Aspects and lastly 3) the Attitudinal and Motivational Aspects.

Vulnerability and Capacity Analysis

HAZARD ASPECT	VULNERABILITY	CAPACITY
Physical/Material		
Economic Activities:		
Fishermen/Farmers	- Seasonal income; no alternative means of livelihood; easily affected by weather change	- 6 barangays with communal irrigation system (Datag Tejero, Lonoy, Alejawan, Cabungaan, Cambugason and Boctol)
Microenterprises	- Many microenterprises are dependent on lending	- Some women managed microenterprises are LGU assisted
Infrastructure Services	- Some inland barangays are not readily accessible due to poor road condition - 2 upland barangays do not have access to communication facilities - Persistence of infectious diseases and lifestyle related diseases - Low rating of Jagna pupils in national assessments; Lack of training of teachers in disaster preparedness - Water is not potable; open water source prone to contamination, infiltration - Unsealed toilets - More trainings for JEMRU personnel and additional equipment; - Houses especially in upland barangays are made of light materials; Houses located near rivers and waterways	- Provincial roads going to upland barangays are already paved; very accessible - 31 barangays are already connected - Presence of 2 RHUs to cater to health needs of all barangays; All barangay health stations are fully functional - 25 Public schools (elem and high school) and 4 private schools; schools as evacuation centers - Presence of JEMRU
Human Capital	- Drainage system in metro Jagna is lacking; floods - Existence of malnourished kids	- Supplemental feedings conducted; Philos Health's Manna Pack
Environmental Factors	- Barren mountains - Lack of water source - Karst type of soil prone to erosion,	- Identified hazard/risk areas - Very detailed GIS mapping

HAZARD ASPECT	VULNERABILITY	CAPACITY
	liquefaction - Prone to earthquake; presence of fault line - Typhoon, storm surge prone, - Many houses are built within the hazard /danger zones - Landslide prone	
Social/Organizational		
Family Structure/Decision-making Leadership	- Conservative, gender biased in decision making - Imposition of decisions (lacking) - 5% appropriation is lacking to address vulnerabilities	- Strong family ties - Coordination between executive and legislative - Strong LCE support of DRRMC
Motivational/Attitudinal		
	- Passivity (in the communities) - Lack of knowledge/awareness (in the communities)	- LGU and barangay officials are already knowledgeable in DRRM; Organized MDRRM, BDRRMC

Hazards: Characterization, areas, and elements at risk

Monsoon Winds/Storm Surges

A temporary rise of the sea level at the coast above that of the predicted tide. It is caused by strong winds and low atmospheric pressure associated with the passage of a typhoon. The period of a storm surge varies from a few minutes to a few hours depending on the speed of the typhoon. We have southwest monsoon (May-October) or known as the "Habagat" and the dry winds of the northeast monsoon (November-April) as the "Amihan". The Habagat season is characterized by cold and hot humid weather, frequent heavy rainfall and typhoons, and a prevailing wind from the west. The Amihan season is characterized by hot temperatures, little or no rainfall, and a prevailing wind from the east. These monsoon winds produce big waves that affect the livelihood of the fisherflok every year especially to those communities facing the sea like the coastal barangays in Jagna. According to the Community Risk Assessment (CRA) result of the Jagna, there are 13 coastal barangays in the municipality dependent to fishing as their major source of livelihood that severely affected during the occurrences of this hazard every year.

Rainfall Induced Landslide (RIL)

Studies worldwide reveal that about 100mm of rainfall per day can cause rain-induced landslide. The Mines and Geo-sciences Bureau of the DENR has defined areas highly susceptible to landslide as those that shows the presence of active or recent landslides, those with large

tension cracks that would affect the community, areas with drainages that are prone to landslide damming and those with steep slopes of from 21% to 55%.

In Jagna, an estimated area of 11,657 hectares are prone to rain induced landslide(RIL). This RIL are influence of infiltration under various rainfall, ground conditions on slope stability. Ground conditions on slope stability is still poorly understood and is one considered major geotechnical hazard. These are barangays of Mayana, Boctol, Balili, Buyog, Cantuyoc, Malbog, Odiong, Laca, Kinagbaan,T-monte and Bunga-Ilaya. Heavy surface run off is observed immediately after heavy rain occurred due to poor water holding capacity in these areas. Rainfall induced landslide is caused by the saturation of the soil with rainwater thereby causing mass movement. Human activities such as slope farming, land development and conversion, can also increase landslide susceptibility of an area. Land use can be a big factor in rainfall induced landslide. Agricultural land with high water seepage was converted into roads, buildings or houses which dramatically decrease the soils ability to absorb water.

Flooding/Flashfloods

A flood is an overflow of an expanse of water that submerges land as a covering by water of land not normally covered by water. Flooding may result from the volume of water within a body of water, such as a river or lake, which overflows or breaks levees. Mostly occur in rivers, when flow exceeds the capacity of the river channel, particularly at bends or meanders. Floods often cause damage to homes and businesses if they are placed in natural flood plains of rivers.

Most flooding in the municipality of Jagna occurs on floodplains. These are natural water storage areas containing rivers or creeks that flow continuously or intermittently. Historically, the easy access to water and the rich diversity and fertility of the flood plains have always attracted by human settlements. These are barangays of Tejero, Poblacion, Pagina, Looc, Can-upao and Bunga Mar. Hence, with the ever-increasing human intervention in the upstream catchments, the downstream consequences and risks increase. It is observed that the flood prone areas with state height of floods that range from 0.4 meters to 1.2 meters high during heavy rains, more so during high tides, are in the barangays of Looc (0.4m), Tejero (0.5m), Pagina (1m), Pondol, Poblacion (1m), Can-upao (1.2) and Bunga Mar (1.2m. Since flooding is a natural hazard and it is affected annually by intensive tropical weather patterns which resulted to a very significant financial cost and personal hardship within the affected areas in the municipality. It is also often exacerbated by ignorant and negligent human intervention in the environment.

Sea Level Rise

Sea levels around the world are rising. Current sea-level rise potentially impacts human populations (e.g., those living in coastal regions and on islands) and the natural environment

(e.g., marine ecosystems). Global average sea level rose at an average rate of around 1.7 ± 0.3 mm per year from 1950 to 2009 and at a satellite-measured average rate of about 3.3 ± 0.4 mm per year from 1993 to 2009, an increase on earlier estimates.It is unclear whether the increased rate reflects an increase in the underlying long-term trend.

Two main factors contributed to observed sea level rise. The first is thermal expansion: as ocean water warms, it expands. The second is from the contribution of land-based ice due to increased melting. The major store of water on land is found in glaciers and ice sheets.

Sea level rise is one of several lines of evidence that support the view that the climate has recently warmed. It is likely that human-induced (anthropogenic) warming contributed to the sea level rise observed in the latter half of the 20th century.

Sea level has been rising has been observe in coastal barangays in Jagna as a result of human-induced climate change sea level rose approximately about 15-20 centimeters (roughly 1.5 to 2.0 mm/year). Some fisher folks can attest that seashore area comes shorter and volume of water run-off were observe during high tides in barangay Bunga Mar or even in the Poblacion area were water were reaches to the tennis court in barangay Poblacion.

Mass Movement of Soil

Mass movement is the movement downhill of weathered rock material (regolith soil, loose stones and rocks) under the influence of gravity. In mass movement, soil, loose stone and rock material falls, rolls, slides or flows downhill. It is caused by natural processes such as excessive rain, rapid undercutting by rivers or sea waves, or by human activities. Areas susceptible to landslides usually include old landslide deposits along, near or beneath steep slopes and downslopes of streams and creeks. Thick soil or fractured rocks; areas along or on top of cut slopes; and developed steep slopes with no appropriate drainage. Even without the use of maps it is possible to identify active landslide areas by looking at telltale signs like cracks or scars, surface depressions, disturbance of the drainage pattern, hammock-like topography and earlobe-like bulges near the base of slopes.

In Barangay Mayana, the very large (52 ha. as of 13 August 2005) landslide originated as a rock fall along a very steep NW-trending fault scarp in the Sierra Bullones Limestone in Sitio Balikbayan. The rock falls started on 11 July 2005. Earlier, a surface-wave magnitude 4.9 earthquake with epicenter in Sierra Bullones (about 46 km east of Tabilaran City) occurred at 8:25 p.m. on 31 March 2005. The epicenter is roughly only 8 km west of the site of the landslide occurrence and is probably related to the movement along the East Bohol Fault. No typhoon had affected the province more than half a year before the landslide. The earthquake probably triggered the landslide in Barangay Mayana. The debris fell on an area underlain by older limestone landslide debris and thickly weathered soils from the underlying volcaniclastic rocks

of the Late Miocene Carmen Formation. The slope of the landslide is only about 13% (7½º). The landslide is elongate, oriented east-west, and has a total length of 1.4 km as of 13 August, 2005.

In the findings and recommendations of the MGB, DENR R7,there is an indication of a possible presence of a fault of which movement of this inferred fault in the past could have caused the development of fractures and joints in the limestone and underlying rock formation;.Observed fracturing and minor rock falls on the limestone in the past indicate that the site has undergone minor slope or ground movement . The causes of the landslide: presence of cavities within the limestone formation; periodic lowering (caused by shrinkage and compaction) and increase in ground level (buoyant effect on rocks) which affected stability of the formation. The landslide is active and could affect houses along its east directed movement

Recommendations that people should be restricted from venturing into the affected zone. Houses near the periphery of the affected area should be relocated immediately as well as those along the path of the landslide debris. Regular monitoring of the advance of the landslide debris. Residents should be vigilant during the rainy period since this could trigger the debris to move faster and should report the presence of new new cracks/fractures.

Earthquake

An earthquake is a shaking of the ground caused by the sudden breaking and movement of large sections (tectonic plates) of the earth's rocky outermost crust. The edges of the tectonic plates are marked by faults (or fractures). Most earthquakes occur along the fault lines when the plates slide past each other or collide against each other.

On February 8, 1990, a tectonic earthquake with magnitude 6.8, struck the island of Bohol at 3:15 pm, caused panic to general public, damaged several houses and infrastructure and presented several geologic disturbances. Its epicenter was located about 17 kilometers east of Tagbilaran City with a maximum felt intensity of VIII, based on Rossi-Forel Intensity Scale, in the towns of Jagna, Duero and Guindulman all situated on the lower area of the NE quadrant of the island.

Observed geologic phenomena related to this event include ground fissures, landslides, rockfalls, ground subsidence and collapse, sand/mud fountaining and sudden increase on the sea level. Most of the manifestations were particularly observed and experienced by the towns of Jagna, Valencia, Duero, Guindulman and Garcia Hernandez. The force of the incoming waves from the sea caused Alijuan River in Duero to flow inland immediately after the earthquake.

Based on the orientation of the main fracture zones, focal mechanism solution and aftershock distribution, the earthquake may have represented subsurface rupture along segments of the NE-SW Alicia thrust fault. Studies by the Bureau of Mines (1986), however, point to the fact that

in most portion of the fault is being overlained by Miocene to recent limestone which does not reflect any deformation suggesting that the fault has been inactive for quite a long time. This would pose a question as to whether the earthquake represented reactivation of an old fault or indicated new fault movement in the island.

The bridge connecting the towns of Jagna and Duero collapsed. Roads to Anda sustained cracks and fissuring. Landslides and rockfalls blocked some portions of the roads that caused inaccessibility to some areas between Anda and Garcia Hernandez.Six fatalities were reported and more than 200 were injured in the event. About 46,000 people were displaced by the event and at least 7,000 among them were rendered homeless. Estimated damage to properties is amounting to 154 million pesos. (PHIVOLCS)

Earthquake Fault line and Tsunami

Minor and major fault lines are evident on the island as shown by terraced encarpments occurring in its southern and central parts. Earthquakes have been felt in the municipality but only an average of one perceptible shock is reported each year. As expected thirteen (13) barangays located in coastal zone are exposed to tsunami. These are located in Can-uba, Ipil, Cantagay, Bunga Mar, Bunga Ilaya, Can-upao, Looc, Poblacion (Pondol), Tejero, Pangdan, Alejawan and Naatang.

Disease Outbreak

A disease outbreak is the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season. An outbreak may occur in a restricted geographical area, or may extend over across provinces. It may last for a few days or weeks, or for several years.

A single case of a communicable disease long absent from a population, or caused by an agent (e.g. bacterium or virus) not previously recognized in that community or area, or the emergence of a previously unknown disease, may also constitute an outbreak and should be reported and investigated.

The most possible outbreaks that may occur in the municipality are dengue fever, diarrheal and typhoid. Dengue fever is an infectious tropical disease caused by the dengue virus. Symptoms include fever, headache, muscle and joint pains, and a characteristic skin rash that is similar to measles. In a small proportion of cases the disease develops into the life-threatening dengue hemorrhagic fever, resulting in bleeding, low levels of blood platelets and blood plasma leakage,

or into dengue shock syndrome, where dangerously low blood pressure occurs. Dengue is transmitted by several species of mosquito within the genus Aedes, principally A. aegypti. The virus has four different types; infection with one type usually gives lifelong immunity to that type, but only short-term immunity to the others.

Diarrhea is the condition of having three or more loose or liquid bowel movements per day. It is a common cause of death in developing countries and the second most common cause of infant deaths worldwide. The loss of fluids through diarrhea can cause dehydration and electrolyte disturbances such as potassium deficiency or other salt imbalances.

Typhoid is a common worldwide bacterial disease, transmitted by the ingestion of food or water contaminated with the feces of an infected person, which contain the bacterium Salmonella enterica, serovar Typhi. The bacteria then perforate through the intestinal wall and are phagocytosed by macrophages. The organism is a Gram-negative short bacillus that is motile due to its peritrichous flagella. The bacterium grows best at 37°C / 98.6°F – human body temperature.

Agricultural Pest and Disease

The major disease and pests affecting the municipality is in the coconut industry include the Cadang-cadang Disease and the Brontispa Longissima which have caused severe losses to major coconut- producing regions in the country and other coconut –producing countries in the world. Jagna is endangered by these pests and disease because of its proximity and transport accessibility to affected provinces thus posing a serious threat to the coconut industry which is a major means of livelihood in the region.

Grass/ Forest Fire

Grass/Forest Fire become a disaster when combustion of carbon-based materials and oxygen goes out of control and spread fast, threatening human life, homes and other structures. Fires also affect agricultural crops, forest vegetation, and livestock during dry seasons. Forest fire can be ignited by lightning during a sudden storm. It could also be caused by burning agricultural wastes in adjoining farms or grazing areas without fire breaks.

Most of the grass fire occurred in Barangay Tejero and Tubod Monte. Measures to increase resiliency includes continuous conduct of IEC and prohibits burning of farm wastes.

Vulnerabilities of elements at risk

Economic Vulnerabilities

- Dependency on single cash crop

- No easily saleable assets or savings
- Very few job or work opportunities available
- Market closed during disasters
- Lack of means to buy food, medicine and shelter material
- Community members have no richer relatives or remittances
- Local credit from money lenders only available at very high interest rates

Physical Vulnerabilities

- House design and structure not strong enough to resist common hazards
- Roads and bridges not usable by motor vehicles for some month of the year
- No landline telephone communication or poor signal for mobile phones
- No protected wells, broken or non-existent irrigation system
- Water transmission and distribution lines destroyed by flashfloods
- Irrigation dams and canals breached
- Electric posts and distribution lines destroyed by storm
- Shortage of tools needed to maintain livelihoods or lack of protection from hazards

Individual (male/female) vulnerabilities

- Low literacy rates on understanding disaster preparedness
- Little knowledge of hazards and how to cope with them; loss of historic experience
- Lack of educational or skills training opportunities
- Prevalence of illnesses such as malaria, dengue, typhoid, etc.
- Women restricted in mobility or dress by the culture
- Schooling of children hampered
- Lack of able-bodied men or women to farm or do other livelihood activities

Social Vulnerabilities

- Family relationships are weak, possibly because of men or women migrating for work
- Relationships between different ethnic, religious, class or livelihood groups in the barangays are poor; no habit of helping each other
- Adverse psycho-social condition of certain segments of the population especially the elderly, the very young, infirm and persons with disabilities
- Community has few or no other social groups
- Government service do not reach members of the community
- Social stereotyping usually against women; others do not value gifts, skills, abilities and experience
- No one in the barangay gives clear and decisive leadership during times of crisis; disputes not settled quickly and/or fairly

Natural Vulnerabilities

- Absence of trees, due to human activity or climatic factors
- Surface water not consistently available throughout the year
- Fish stocks reduced through over-fishing, siltation or pollution
- Limited amount of grazing land available
- Soil impoverished due to mono-cropping and erosion

Productive Assets Vulnerabilities

- Destruction of productive agricultural areas (crops, livestock) and farm machineries unserviceable
- Destruction of tourism-related establishments (resort, spas, restaurants, and café)
- Loss of vegetation cover and wildlife
- Sources of livelihood affected
- Destruction of agricultural lands
- Siltation of rivers
- Destruction of agricultural, commercial and industrial infrastructures
- Low productivity
- Loss of marketable products

Capacities of Elements at Risk

Population

- People should work better in their own day-to-day affairs and these will include:
    - elements of human resource development (individual training)
    - organizational development (improving the functioning of groups and organizations)
    - institutional development (the formalization of group initiatives into social structures with legal and regulatory authority to allow efficient functioning of groups and individuals)
- Increased environmental awareness to the residents in hazard prone areas
- Implementation of continuing environmental programs such proper solid waste management , tree growing activities, dredging and declogging of rivers and creeks, storm drainage, canals and waterways clean-up etc.
- The general public will make informed decisions regarding disaster preparedness
- Increasingly effective mitigation program ideas will become available.
- The political will to implement risk reduction programs will increase.

Productive Assets

- Promote natural farming system that promotes sustainability and an increase in farm yield.
- More of the economy can be devoted to development instead of disaster recovery.
- Strict implementation of RA 9003 (Ecological Solid Waste Management Act of 2000), PD 856 (Code of Sanitation) and RA 9275 (Philippine Clean Water Act of 2004)
- Industrial and commercial activities shall be properly located considering their potential traffic generation and pollution impact.
- Strict zoning regulation shall be enforced on livestock and piggery houses located in residential areas.
- Contour tillage and similar sustainable practices shall be strictly enforced among sloping land cultivators.
- The effects of agricultural chemical residues shall be monitored and regulated.
- Environmental impact rather than potential revenue shall be the primary consideration in granting permits for small-scale mining and quarrying.
- Tourism projects shall be evaluated equally for their income generation potential as for the environmental degradation, displacement of local residents, and moral corruption that usually accompany these projects.

Infrastructures

- Buildings, especially critical facilities, will be more likely to withstand disasters.
- Strict implementation of BP 220 Building Code, Structural code and land use and zoning policies
- Properly sited and designed so as not to become source of anthropogenic hazards themselves.
- Minimized exposure to geo-hydrological hazards.
- Retrofit old structures for adaptive reuse to preserve their historical or heritage value.
- Establish civil works that assist nature to rehabilitate itself or to maintain its own integrity.

Chapter 3. DRRM AND CCA-SENSITIVE COMPREHENSIVE LAND USE PLAN

Proposed urban form for safe urban settlements

The trend alternative reflects the probable scenario of Jagna if the existing conditions are allowed to continue and the direction of present activities will follow its natural course. Urbanization will essentially follow a *linear pattern of growth* or a ribbon type of development along the areas traversed by the national, provincial and municipal roads. The Barangays Poblacion, Pagina,Looc and Can-upao will be maintained as the central business district and will remain as the core urban

growth in the municipality. However, there is a need to identify and define the direction of development towards the urbanizing barangays, wherein an expansion of built-up areas is applied as a sub-center that would serve as a production and marketing center of agricultural produced in the town. As a major trading center in the southeastern part of the province, the municipality would become the institutional and settlement center in Bohol. Due to urbanization process, a tremendous demand for land will be expected. Since development is highly concentrated in the urban areas, future activities like the basic services and facilities shall be provided to the strategic barangays mentioned and indicated in the land use plan.

Proposed policies for a risk-sensitive zoning ordinance

The whole barangays of Poblacion, Bunga Mar, Can-upao, Looc, Pagina and portion of barangay Canjulao, Tejero and Pangdan are declared as the urban zone or they are officially called now as the Metro Jagna cluster. It is further shown in the official Urban Zoning Map of the municipality.

On Settlements:

- Vulnerable settlements particularly where there is the presence of a significant number belonging to the vulnerable groups that cannot be relocated shall have an operational community-based disaster management plan. Ensure that women and other vulnerable groups are involved in the Hazard Vulnerability and Capacity Assessment (HVCA) mapping and in the formulation of the disaster management planning as well as in the conduct of Damage Assessment & Needs Assessment (DANA) to ensure that their particular situation and specific needs are considered.

- Residential use shall enjoy priority over all other uses in the allocation of hazard-free areas.
- Restrict or discourage development in hazard-prone areas.
- Hazard-exposed settlements, urban and rural shall be located to safe areas.
- Vulnerable settlements that cannot be relocated shall have an operational community-based disaster management plan.
- Multi-storey dwellings shall be sited in safe areas determined by scientific studies, and for evacuation purposes during floods.
- Limit development in environmentally sensitive areas such as steep slopes.
- Regular monitoring and evaluation of structurally quality of dwellings shall be established in the municipality.

On Infrastructures:

- Properly sited and designed so as not to become source of anthropogenic hazards themselves.
- Minimized exposure to geo-hydrological hazards.
- Retrofit old structures for adaptive reuse to preserve their historical or heritage value.

- Establish civil works that assist nature to rehabilitate itself or to maintain its own integrity.

On Production Areas:

- Industrial and commercial activities shall be properly located considering their potential traffic generation and pollution impact.
- Strict zoning regulation shall be enforced on livestock and piggery houses located in residential areas.
- Contour tillage and similar sustainable practices shall be strictly enforced among sloping land cultivators.
- The effects of agricultural chemical residues shall be monitored and regulated.
- Environmental impact rather than potential revenue shall be the primary consideration in granting permits for small-scale mining and quarrying.
- Tourism projects shall be evaluated equally for their income generation potential as for the environmental degradation, displacement of local residents, and moral corruption that usually accompany these projects.

On Protection Areas:

- Liberal allocation of open space in heavily populated areas shall be used as a vulnerability-reduction measure.
- Encourage the maintenance of greenery in public and private lots not only for amenity but for its carbon sequestration function.
- Environmentally critical and hazardous areas shall be properly demarcated and buffered.
- The ecological function shall be paramount over economic and other considerations when allowing the use of protected areas

On Health and Well Being (including Human capital):

Access to minimum standards in disaster response as set forth in the Humanitarian Charter including need for water, sanitation, nutrition, food, shelter, clothing, healthcare and others.

- Physical ability to labor and good health maintained in normal times through adequate food and nutrition, hygiene and health care.
- Food supplies and nutritional status secure (e.g. through reserve stocks of grain and other staple foods managed by communities, with equitable distribution system during food crises).
- Access to sufficient quantity and quality of water for domestic needs during crises.
- Community structures and culture support self confidence and can assist management of psychological consequences of disasters (trauma, PTSD).

- Community health care facilities and health workers, equipped and trained to respond to physical and mental health consequences of disasters and lesser hazard events, and supported by access to emergency health services, medicines, etc.

On Sustainable Livelihoods

- High level of economic activity and employment particularly among the vulnerable groups (ensuring that women have sustainable livelihood and income by providing them with skills training and inputs).
- Equitable distribution of wealth and livelihood assets in community
- Livelihood diversification (household and community level), including on-farm and off-farm activities in rural areas
- Adoption of hazard-resistant agricultural practices (e.g. soil and water conservation methods, cropping patterns geared to low or variable rainfall, hazard-tolerant crops) for food security
- Enterprises have business protection and continuity/recovery plans by including risk register management particularly of micro-enterprises
- Local trade and transport links with markets for products, labor and services protected against hazards and other external shocks

On Physical Protection, Structural and Technical Measures

- Community decisions and planning regarding built environment take potential natural hazard risks into account (including potential for increasing risks through interference with ecological, hydrological, geological systems) and vulnerabilities of different groups.
- Security of land ownership/tenancy rights. Low/minimal level of homelessness and landlessness.
- Safe locations: community members and facilities (homes, workplaces, public and social facilities) not exposed to hazards in high-risk areas and/or relocated away from unsafe sites.
- Structural mitigation measures (embankments, flood diversion channels, water harvesting tanks, etc.) in place to protect against major hazard threats, built using local labor, skills, materials and appropriate technologies as far as possible.
- Knowledge and take-up of building codes/regulations throughout community.
- Adoption of hazard-resilient construction and maintenance practices for homes and community facilities using local labor, skills, materials and appropriate technologies as far as possible
- Community capacities and skills to build, retrofit and maintain structures (technical and organizational).

- Adoption of physical measures to protect items of domestic property (e.g. raised internal platforms and storage as flood mitigation measure, portable stoves) and productive assets (e.g. livestock shelters).
- Adoption of short-term protective measures against impending events (e.g. emergency protection of doors/windows from cyclone winds)
- Infrastructure and public facilities to support emergency management needs (e.g. shelters, secure evacuation and emergency supply routes). In appropriate cases, provide a separate center for women and their children at the maximum, or bath and toilet facilities and needed privacy for women, girl-child are provided for at the minimum. An emergency response for women and vulnerable groups shall be designed to include search and rescue operations, evacuation management and rehabilitation plans.
- Resilient and accessible critical facilities (e.g. health centers, hospitals, police and fire stations - in terms of structural resilience, back-up systems, etc.)
- Resilient transport/service infrastructure and connections (roads, paths, bridges, water supplies, sanitation, power lines, communications, etc.)

Safe Building Regulations

- Local Sanggunian should enact building ordinance responsive to local needs and peculiarities.
- Strictly enforce safe engineering standards.
- Retrofit obsolescent but reusable structures.

Chapter 4. DRRM and CCA-compliant Comprehensive Development Plan

Measures to close the vision-reality gap

Indicators of "Disaster Resilient" Sectors	Current Reality	Level of Attainment	Vision-Reality Gap	What to do to fill the gap
ECONOMIC • sufficiency in food and agricultural products • institutionalized sustainable farming systems • sustainable and viable livelihood and micro-enterprises • enhanced security of farmers as related to land tenure • Vibrant climate for economic opportunities	• Rain-fed dependent rice farmers • Organic demo farms established • LGU assisted micro-enterprises • Agricultural lot land titling on-going	**6**	**4**	• Adaptation to climate change • Venture to new farming technology and innovations • Plan and design economic opportunities to attract investors
SOCIAL • Improved quality of life of the people in the municipality • Increased access to health care especially by the marginalized sectors • Improved academic performance and reading comprehension skills of the pupils in the public elementary school • Enhanced access to social welfare services by the disadvantaged groups • Improved public order and safety	• Forging partnership with PHILOS Health for the whole year round supply of basic medicines • Support national programs like 4Ps, Philhealth ng Masa, etc. • Lack of personnel for protective services	**5**	**5**	• Sustainability of existing partnerships, NGO support and convergence efforts • Support and align national programs on health and social welfare services • Lobby to national government for additional deployment of protective personnel

INFRASTRUCTURE • Improved various infrastructure projects to support economic, environmental , development administration, and social goals	• Infrastructure support started like improvement of FMR, irrigation facilities and farm machineries	**7**	**3**	• Political will to implement the policies, plans and development directions.
ENVIRONMENT • Make the community environmentally-sound and responsive to climate change • Sustained, vibrant, and rich coastal and marine resources	• Mainstream DRRM/CCA in all local planning, systems and processes	**8**	**2**	• Continuing advocacy on disaster resilient community • Climate change adaptation
GOVERNANCE • GAD-oriented, morally upright, productive, and competent LGU officials and employees • Responsive and effective local legislation • Maximized collection of local revenues • Promotion of transparency and customer satisfaction	• Gender-responsive planning and implementation • Sustained advocacy on good governance with active participation of various stakeholders	**9**	**1**	• Implement new revised local revenue code • To take off establishment of Sanitary landfill • Sustain good practices • Seal of good housekeeping practices maintain

Measures to reduce vulnerabilities and/or increase capacities of elements at risk

Societal Measures

Planning for risk reduction should aim to develop a "safety culture" in which people are aware of the hazards they face, assume a responsibility to protect themselves as fully as they can, and continuously support public and institutional efforts made to protect their community. Community involvement in mitigation planning processes can include public meetings and consultations, public inquiries and full discussion of decisions in the normal political forum. Further awareness can develop through regular practice drills, practice emergencies and anniversary remembrances. In hospitals, schools and large buildings, it is necessary to rehearse what the occupants should do in the event of fire, earthquake or other hazard. In schools, children may practice earthquake drills. This reinforces awareness and develops automatic behavioural responses.

Physical Planning Measures

Many hazards are localized with their likely effects confined to specific well defined areas. Floods occur in flood plains, landslides occur on steep, soft slopes, and so on. The effects can be greatly reduced if it is possible to avoid the use of hazardous areas for settlements or as sites for important structures. Physical planning measures are easiest to implement with public sector facilities, since government has direct control over their funding and placement. The careful location of public sector facilities can play an important role in educating the public and reducing the vulnerability of a settlement. To give priority to land development of relocation sites in the investment programs and not to allow mass settlement in coastal areas too close to the sea.

Economic Measures

Equitable economic development is the key to risk reduction. A strong economy in which the benefits are shared throughout the society is the best protection against a future disaster. Economic development is likely to be the main goal regardless of risk reduction objectives. Some aspects of economic planning are directly relevant to reducing disaster risk. Diversification of economic activity is as important an economic principle as reducing concentration is in physical planning. A single industry (or single-crop) economy is always more vulnerable than an economy made up of many different activities. The linkages between different sectors of an economy—the transportation of goods, the flow of information, the labor market—may be more vulnerable to disruption from a disaster than the physical infrastructure. The reliance of industry and the economy on infrastructure—roads, transportation networks, power, telephone services, etc.—means that a high priority should be placed on protecting these facilities since the consequential losses or failures are costly to the whole community.

Engineering and Construction Measures

Actions to make structures more resistant to hazards primarily involve improvements in design, construction and maintenance of buildings, achieved through institutional means such as design standards, building codes and performance specifications for facilities designed by engineers as well as local builders trained in appropriate construction techniques. Building codes based on disaster-resistance are unlikely to result in stronger buildings unless the engineers and builders who implement them accept their importance and endorse their use. In addition, engineers and builders must understand the code and the design criteria required of them. Responsible authorities must fully enforce the code by checking and penalizing designs that do not comply.

Regulatory measures to incorporate in the SB's legislative agenda

Regulatory measures are also a necessary instrument of management in that they seek to prevent or preempt certain socially undesirable actions and behaviours that tend to nullify or neutralize the benefits that may accrue from the positive intervention measures. In the particular case of necessary regulations to implement this DRR/CCA, the municipal zoning ordinance has delineated hazard-prone areas as no-build zones in order to put future settlements permanently out of harm's way. Other specific regulations will be enacted through single-subject ordinances as the need arises.

Strongly suggests to the Sangguniang Bayan to encourage land use application of land use policies and land use planning in disaster management. It needs a strong and responsive political will, commitment and leadership. It is best done through customized adoption.

Activities to be added to functions of existing LGU departments and offices

Build capacities to efficiently manage all types of emergencies and disaster preparedness by designating each department head in the LGU a role how to respond in the event of disaster. A working group should organized to address a functional committees and maximizing their tasks and functions in mainstreaming DRRM/CCA in the LGU systems and processes.

Chapter 5. Implementing the DRRM and CCA Plan

Priority projects for inclusion in the LDIP/AIP

5.1.a Sustainable Jagna Emergency Medical and Rescue Unit (JEMRU) 24/7 Operation
5.1.b Regular dredging and declogging of rivers siltation along Jagna creeks.
5.1.c Construction and rehabilitation of sewerage and drainage in the locality
5.1.d Storm drainage canals and waterways clean-up by its community.
5.1.e Establishment of Jagna ALERT System
5.1.f Continuing Tree Growing Activities in the Lanslide prone areas
5.1.g Developing of early warning device, sea level rise indicator, rain-gauge,etc.

Priority projects for lobbying with the national government

5.1.h Rehabilitation of Flood Control, River Dikes and maintenance works
5.1.i Demolition of riverside area of along Jagna Public Market and develop into promenade or boulevard.
5.1.j Provision of rubber boat for emergency.
5.1.k Pagina-Looc Riverside Development
5.1.l Rehabilitation/Construction Damaged Wooden Bridges

Hazard-specific Disaster Preparedness Plan

5.1.m Contingency Planning on Landslide Prone Areas

5.1.n Contingency Planning in Low-lying Areas or flood plain areas.

Proposals for more detailed studies and planning

5.1.o Sewerage and Drainage Master Plan in urbanizing Barangays
5.1.p Rehabilitating biodiversity and developing eco-tourism municipality.

Chapter 6. Institutional Arrangements for Disaster-Resilient Governance

Municipal Disaster Risk Reduction and Management Council

Sec. 11 of Republic Act 10121 provides for the organization of the local government level of the disaster Risk Reduction and Management Council and accordingly the existing Municipal Disaster Coordinating Council (MDCC) under PD 1566 shall henceforth be known as Municipal Disaster Risk Reduction and Management Council (MDRRMC). The new MDRRMC is composed of the following:

Composition

Atty. Fortunato R. Abrenilla	-	Chairperson
Engr. Gerry V. Araneta	-	MDRRM Officer Designate
	-	Chairperson on Prevention and Mitigation
Mr. Lito O. Dajalos	-	Chairperson on Preparedness
Mrs. Marcionila E. Reyes	-	Chairperson on Response
Engr. Josefina S. Rañoa	-	Chairperson on Rehabilitation and Recovery
Mr. Vicente Ll. Orias	-	MDRRM Action Officer

Members:

1. Dr. Arnold Dasio M. Cagulada - Municipal Health Officer
2. Dr. Emilio Raymond Claudio - RHU 2 Doctor
3. Mr. Camilo A. Rizano - Municipal Agriculture Officer
4. Mrs. Brigida B. Aceron - Municipal Budget Officer
5. Mrs. Delfina A. Ola-a - DepEd District Supervisor
6. Ms. Lovella E. Acebs - Local Civil Registrar
7. PC/Insp. Mercedarious Balabat - PNP Chief
8. Insp. Raul G. Bustaliño - BFP Chief
9. Hon. Cirilo C. Acedo - President, Liga ng mga Barangay
10. Hon. Teofisto C. Pagar Sr. - SB Chairperson Committee on Environment
11. Hon. Rodrigo Lloren - SB Chairperson on Peace and Order
12. SB Committee on Disaster Risk Reduction and Management
13. Representative each of Four Accredited Civil Society Organizations:
    a. Bohol Initiative on Migration and Community Development
    b. Jagna Motorcab Operators and Drivers Association, Inc. (JAMCODA)
    c. Alejawan-Naatang Fishers Association
    d. Jagna Federated Parents Teachers Association (Jagna Federated PTA)
    e. Jagna Parish Pastoral Council (JPPC)

Functions. – The MDRRMC shall have the following functions:

1. Approve, monitor and evaluate the implementation of the LDRRMP and regularly review and test the plan consistent with other national and local planning programs;
2. Ensure the integration of disaster risk reduction and climate change adaptation into local development plans, programs and budgets as a strategy in sustainable development and poverty reduction;
3. Recommend the implementation of forced or preemptive evacuation of local residents, if necessary; and
4. Convene the local council once every three months or as necessary.

Creation of Local Disaster Risk Reduction and Management Office (LDRRMO).

To assist the MDRRMC, there shall be created a Municipal Disaster Risk Reduction and Management Office (MDRRMO) which shall be under the Office of the Mayor.

Initially, it shall be headed by Mr. Vicente Ll. Orias Administrative Aide IV of MPDC Office as MDRRM Action Officer and three (3) staff designate from MPDO responsible for:

a) Administration and Training – Mr. Lindley Galolo
b) Research and Planning – Ms. Amiela S. Balaba
c) Operation and Warning – Mr. Balbino Balaba

Function of LDRRMO. – The LDRRMO shall have the following functions:

a) Design, program, and coordinate disaster risk reduction and management activities consistent with the National Council's standards and guidelines;
b) Facilitate and support risk assessments and contingency planning activities at the local level;
c) Consolidate local disaster risk information which includes natural hazards, vulnerabilities, and climate change risks, and maintain a local risk map;
d) Organize and conduct training, orientation, and knowledge management activities on disaster risk reduction and management at the local level;
e) Operate a multi-hazard early warning system, linked to disaster risk reduction 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.
f) Formulate and implement a comprehensive and integrated LDRRMP in accordance with the national, regional and provincial framework, and policies on disaster risk reduction in close coordination with the local development councils (LDCs);
g) Prepare and submit to the local sanggunian through the LDRRMC and the LDC the annual LDRRMO Plan and budget, the proposed programming of the LDRRMF, other dedicated disaster risk reduction and management resources, and other regular funding source/s and budgetary support of the LDRRMO / BDRRMC;

h) Conduct continuous disaster monitoring and mobilize instrumentalities and entities of the LGUs, CSOs, 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;
i) Identify, assess and manage the hazards, vulnerabilities and risks that may occur in their locality;
j) Disseminate information and raise public awareness about those hazards, vulnerabilities and risks, their nature, effects, early warning signs and countermeasures;
k) Identify and implement cost-effective risk reduction measures/strategies;
l) Maintain a database of human resource, equipment, directories, and location of critical infrastructures and their capacities such as hospitals and evacuation centers;
m) Develop, strengthen and operationalize mechanisms for partnership or networking with private sector, CSOs, and volunteer groups;
n) 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 disaster risk reduction and management in its area;
o) Organize, train, equip and supervise the local emergency response teams and the ACDVs, ensuring that humanitarian aid workers are equipped with basic skills to assist mothers to breastfeed;
p) 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;
q) Within its area, promote and raise public awareness of and compliance with this Act and legislative provisions relevant to the purpose of this Act;
r) Serve as the secretariat and executive arm of the LDRRMC;
s) Coordinate other disaster risk reduction and management activities;
t) Establish linkage/network with other LGUs for disaster risk reduction and emergency response purposes;
u) Recommend through the LDRRMC the enactment of local ordinances consistent with the requirements of this Act;
v) Implement policies, approved plans and programs of the LDRRMC consistent with the policies and guidelines laid down in this Act;
w) Establish a Provincial/ City/Municipal/Barangay Disaster Risk Reduction and Management Operations Center;
x) Prepare and submit, through the LDRRMC and the LDC, the report on the utilization of the LDRRMF and other dedicated disaster risk reduction and management resources to the local COA, copy furnished the regional director of the OCD and the Local Government Operations Officer of the DILG; and
y) Act on other matters that may be authorized by the LDRRMC.

Meetings. – Pursuant to Item No.4 of the LDRRMCs functions, the Council shall hold meetings once every three (3) months or as may be necessary or when called by the Chairperson;

Barangay DRRM Committee

Every Barangay has organized its functional Barangay Disaster Risk Reduction and Management Committee (BDRRMC) that composed of barangay officials and civil society groups in the barangays. The punong barangay had appointed its Barangay Disaster Risk Reduction Action Officer who will coordinate and make reports on disaster preparedness activities to the Municipal DRRM Office.

Linkages, Partnerships, and Networks

In collaboration of national and local line agencies including non-government organizations, partnerships and convergence efforts should adhere especially in times of disaster occurrence and calamities. Linkage to provincial, regional and national department of social welfare and development in the event of post assessment when disaster strikes. Strong partnership with Philippine Red Cross – Bohol Chapter, PDRRMC, Office of the Civil Defense and to the National Disaster Risk Reduction and Management Council.

Monitoring and Evaluation

Monitoring and evaluation is the process of gathering, filing, accessing and analyzing information that will enable the Municipal Mayor as Disaster Risk Reduction and Management Council Head to determine the progress of the implementation of the MDRRM Plan, and make timely decisions to ensure that progress is maintained according to schedules and targets.

The public dissemination of the outputs of monitoring and evaluation activities enhances transparency in management.

The MDRRMO shall be primarily responsible in carrying out monitoring and evaluation activities but whose work shall be reviewed by the Municipal Disaster Risk reduction and Management as the overseeing body of the municipality for disaster risk reduction and management

The MDRRMO shall submit a monthly, quarterly and an annual report to the MDRRMC and to the Municipal Mayor informing them of the state of the implementation of the approved MDRRM program/projects for the period.

Generally, coastal communities are highly vulnerable to all types of hazards as illustrated in hazard risk maps such as rain-induced landslide, storm surge, tsunami, multi-hazard maps, etc.). Most of these communities are situated in the low lying areas along the coast where major rivers are traversing along the plain leading down to the sea. As a rule of thumb, people on the affected communities are advised to move and position themselves on the designated evacuation areas that are practically elevated and very proximate to them whenever a disaster occur.

Incompliance to RA 10121 and Memorandum Circulars on Disaster Risk Reduction issued by the Department of Interior and Local Government (DILG), Municipality of Jagna through its Municipal Disaster Risk Reduction and Management Office (MDRRMO) identified possible evacuation areas in preparation to the worst case scenarios that will happen if typhoon, storm surges, landslide, tsunami and other hazards will occur and affect the municipality.

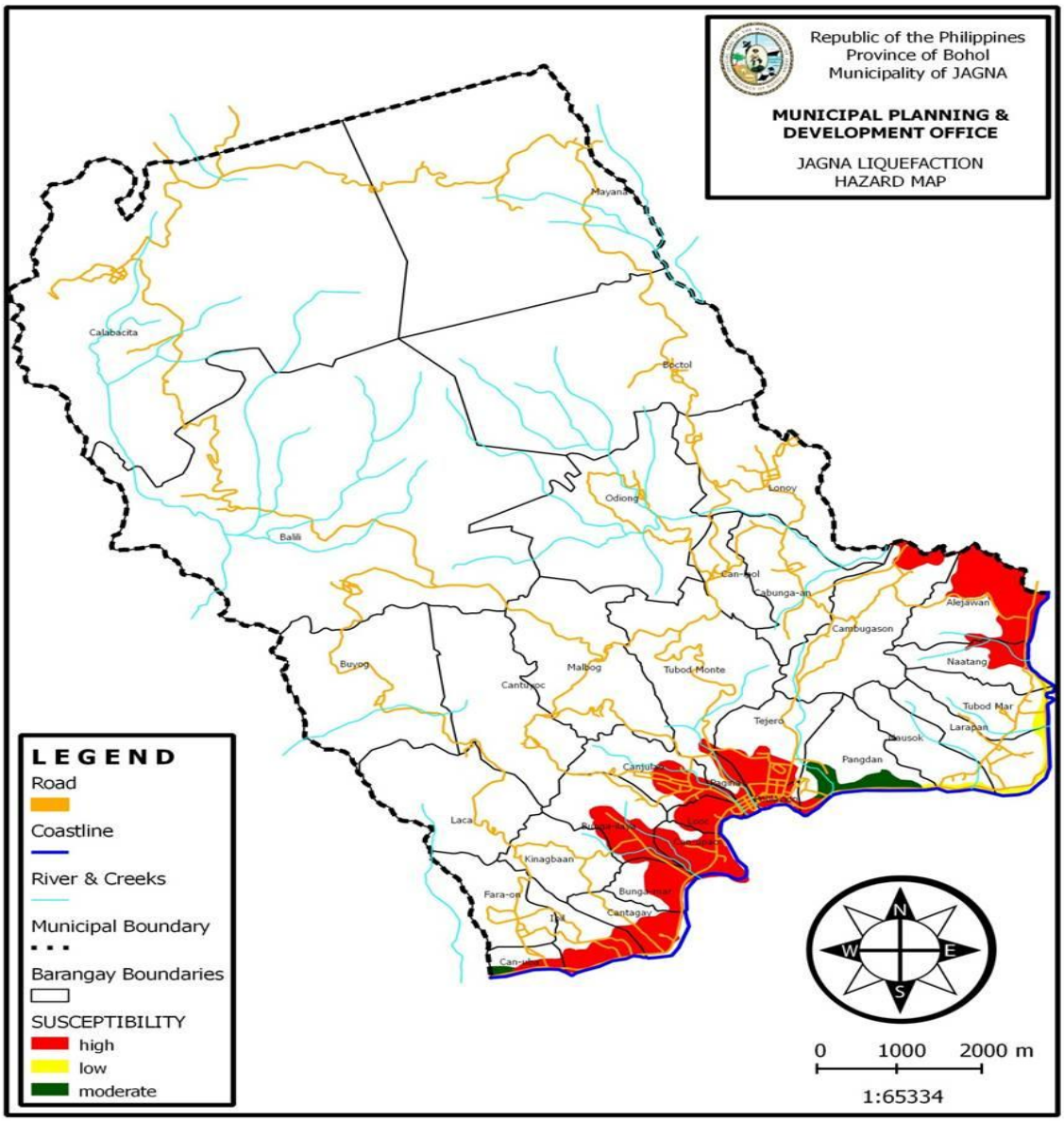
The Evacuation Centers/Areas that have been identified are located in elevated areas in Jagna. These Evacuation Center/Areas are the Schools, Multi-Purpose Hall and upland areas of Jagna. The following are the official and identified areas of Malbog Elementary School, Tubod Monte School, Ilihan Hill Area, Faraon Elementary and High School of Brgy Faraon, Kinagbaan Multi-Purpose Hall, Upper Tubod Mar and other upland barangays.

MDRRMO in coordination to MDRRMC, have already established the necessary arrangement and protocols to the concerns School Supervisors, and Barangay official on the standard operating procedures (SOP's) if evacuation is necessary at all times.

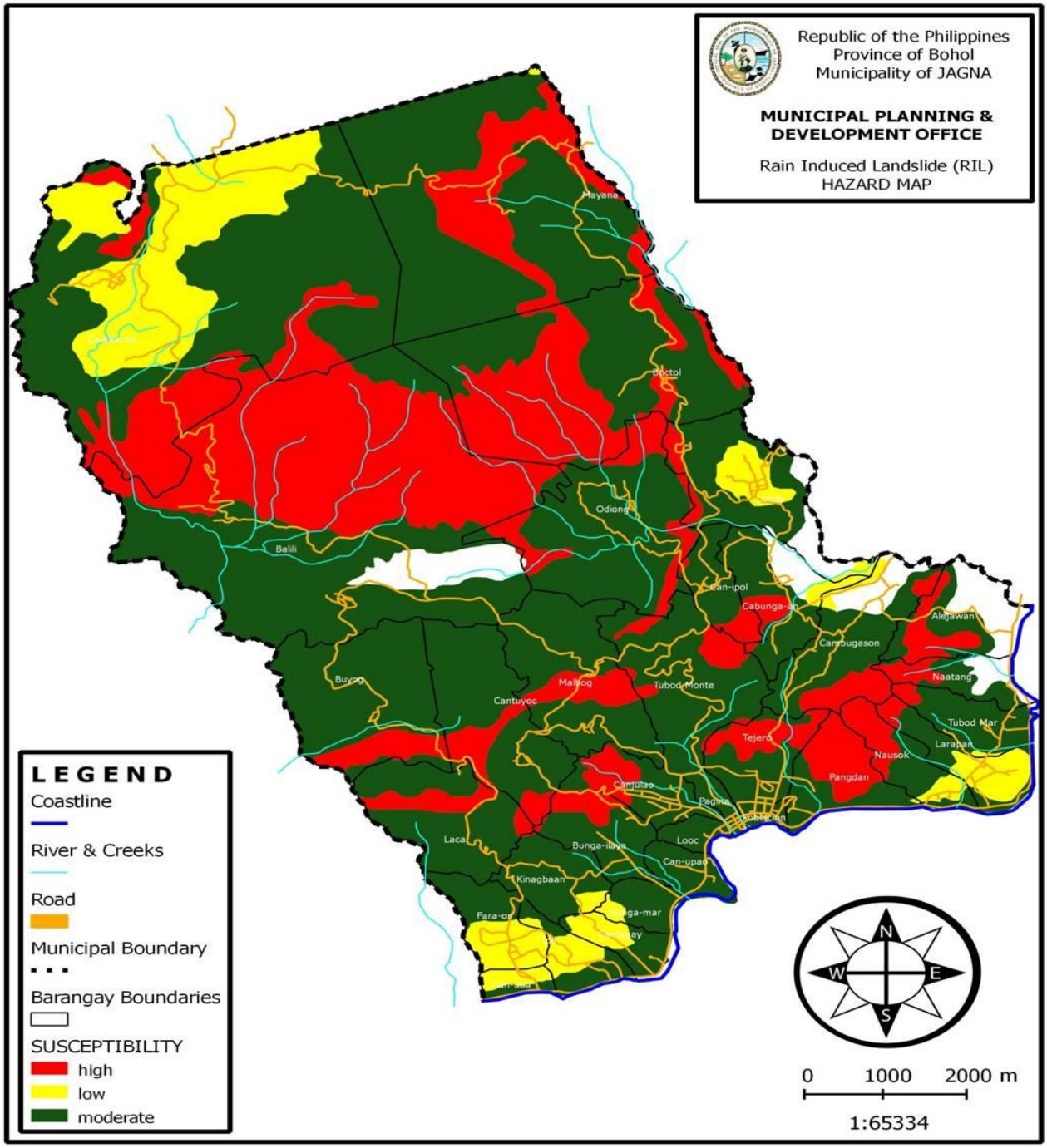
MDRRMO in coordination to MDRRMC have already established necessary arrangements and protocol to the school supervision and Barangay officials of the identified evacuation center. Adequate signage should be properly installed in strategic places to practically guide evacuees with the way leading to the designated evacuation areas. Likewise continuous IEC and community awareness are regularly done as part of our preparedness activities to raise the awareness of the communities and help build their capacities and eventually become resilient community.

Appendices

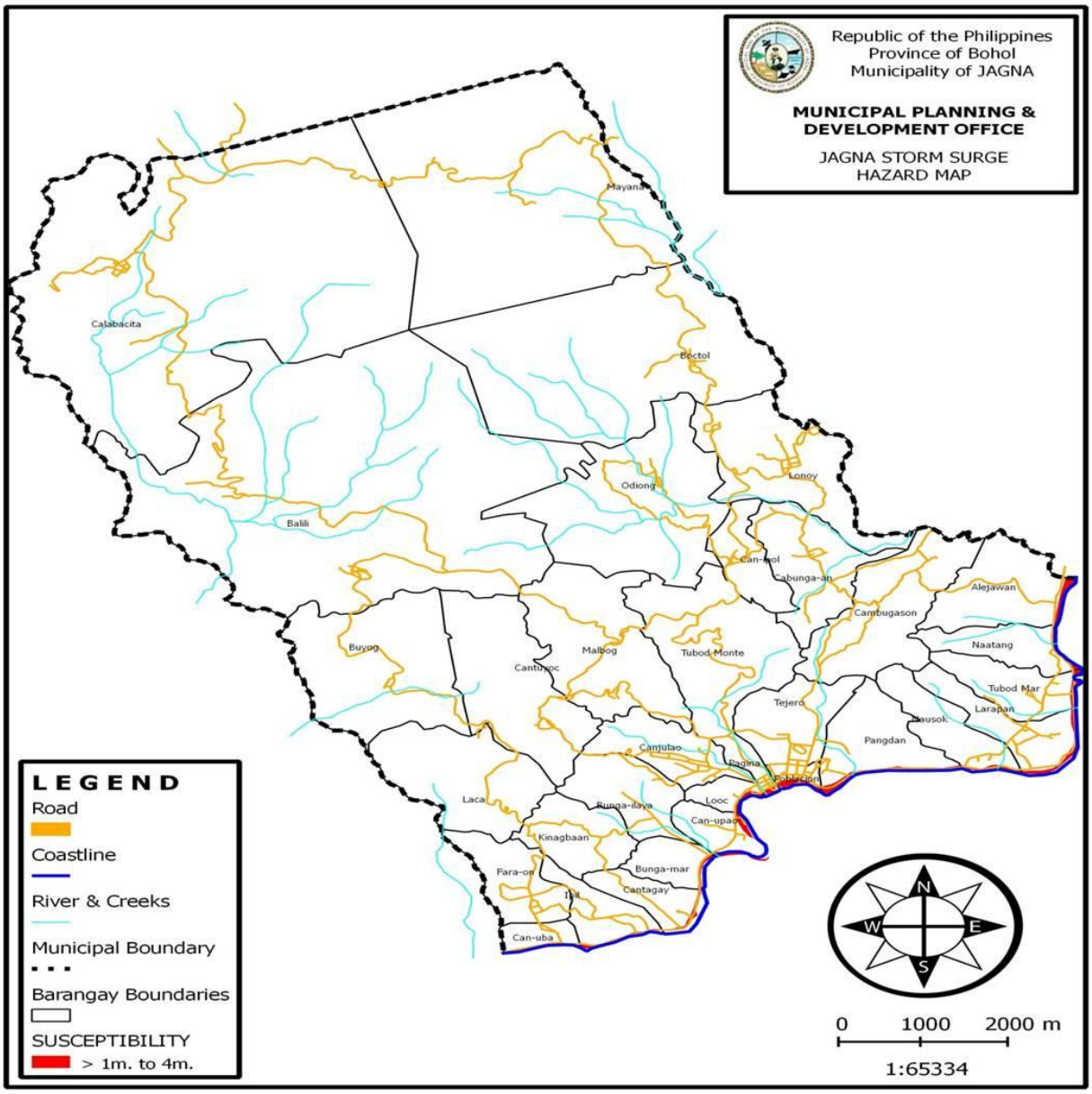
- ***Liquefaction Hazard Map***
- ***Rain-induced Landslide***
- ***Storm Surge Hazard Map***
- ***Multi-Hazard Map***
- **Timeline of Disaster happen in Jagna**
- ***THE FIVE- YEAR MUNICIPAL DISASTER RISK REDUCTION AND MANAGEMENT PLAN MATRIX***
- **MDRRM Organizational Structure**
- **Over-all Summary of Budget**



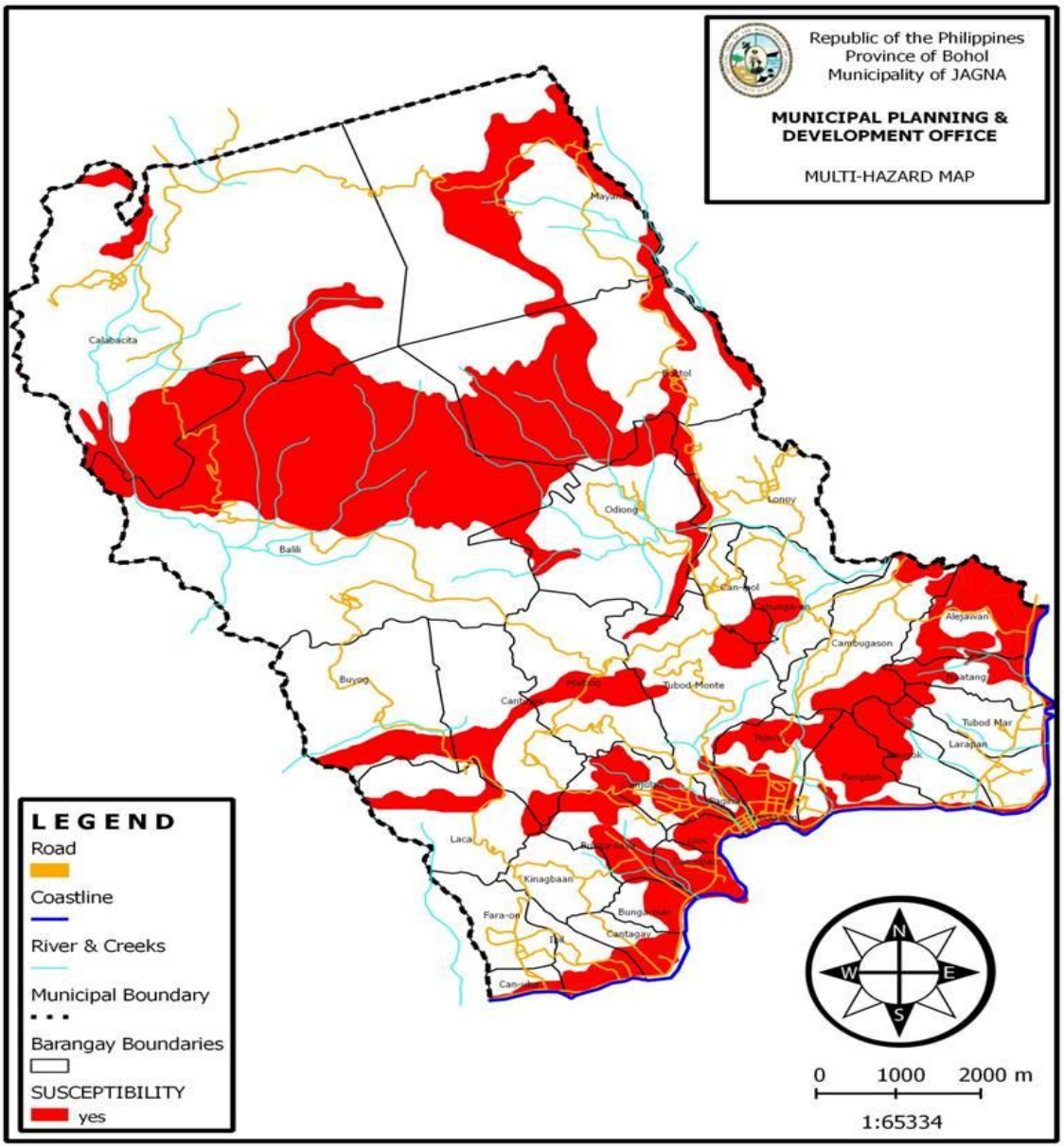
Criteria Maps Overlayed	Decision Zones Identified	Explanations	Implications	Policy Option
Liquefaction Hazard	An estimated area of 701 has. Of Jagna are prone to Liquefaction Hazard in the following barangays of Can-uba, Ipil, Cantagay, Bunga-Mar, Bunga-ilaya, Canupao, Looc, Canjulao, Pagina, Tejero, Poblacion, Pangdan, Nausok, Larapan, Tubod-Mar, Naatang, Alejawan and Cambugason.	Liquefaction may occur when water-saturated sandy soils are subjected to earthquake ground shaking. When soil liquefies, it loses strength and behaves as a viscous liquid (like quicksand) rather than as a solid.	This can cause buildings to sink into the ground or tilt, empty buried tanks to rise to the ground surface, slope failures, nearly level ground to shift laterally tens of feet (lateral spreading), surface subsidence, ground cracking, and sand blows.	The cost of site investigations and/or mitigation measures should be balanced with an acceptable risk. e.g. should be refer to geotechnical experts or from the Mines and Geosciences Bureau if the ground is susceptible to liquefaction.



Criteria Maps Overlayed	Decision Zones Identified	Explanations	Implications	Policy Option
Rain Induced Landslide Hazard	An estimated area of 11,657 has. Of Jagna are prone to Rain Induced Landslide Hazard in all barangays of Jagna.	Rain-induced landslides are influence of infiltration under various rainfall, ground conditions on slope stability	Ground conditions on slope stability is still poorly understood and is one considered as major geotechnical hazard.	Investigate the different rainfall events, rainfall intensity and rainfall duration



Criteria Maps Overlayed	Decision Zones Identified	Explanations	Implications	Policy Option
Storm Surge Hazard	An estimated area of 66 has. Of Jagna are prone to Storm Surge Hazard in 14 coastal barangayss of Jagna.	Storm surge is water that is pushed toward the shore by the force of the winds swirling around the storm. A storm surge can come from a typhoon or an extra-tropical cyclone.	When a tropical cyclone moves across or near the coast, it can cause sea levels to rise higher than the normal tide levels.	At all times, the warnings and instructions issued by the weather forecast/MDRRMC should be heeded.

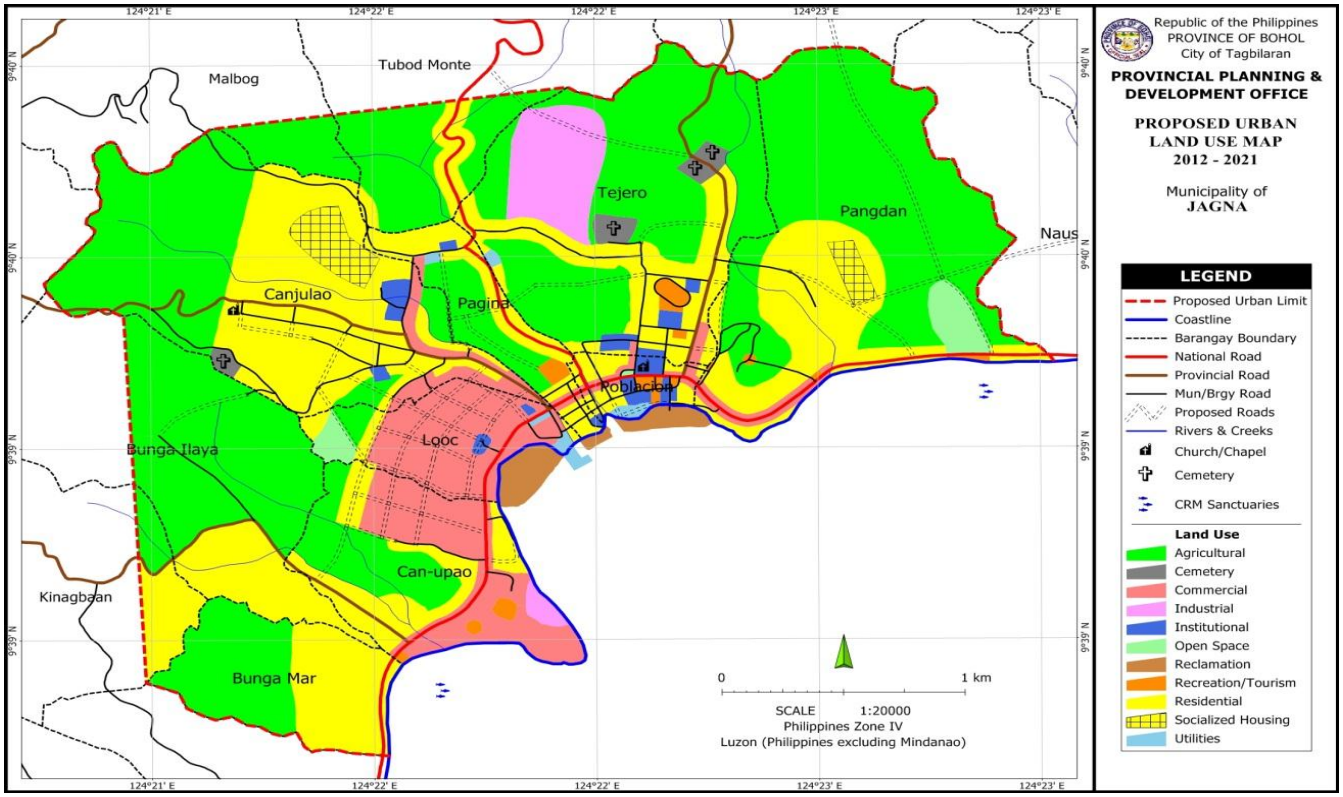


Criteria Maps Overlayed	Decision Zones Identified	Explanations	Implications	Policy Option
Multi-hazard	An estimated area of 3837 has. of Jagna prone to multi-hazard in all 33 barangays of Jagna.	Area that has a highest risk by far throughout all of the analyses.	multi-hazard risks give an indication of the overall risk posed to the community	Creation of planning team for safety and to analyze all of the vulnerability and risk; develop a hazard reduction technique

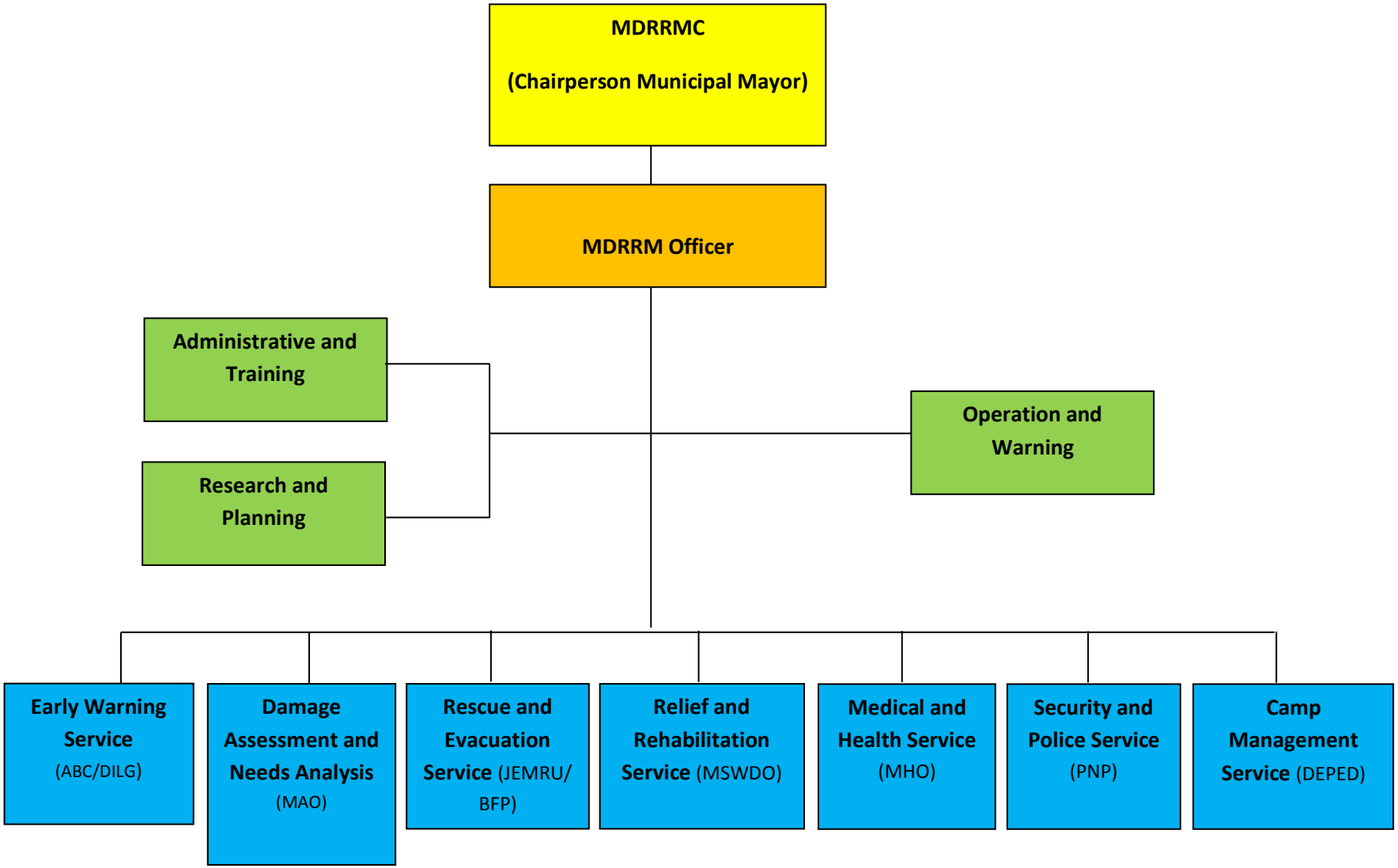
Klase sa Katalagman	**Typhoon "Nitang"**	**Jagna Earthquake**	**Typhoon "Ruping"**	**Storm Surge along coastal Brgys**	**Sunog sa Merkado**	**Mayana Landslide**	**Heavy Rainfall that causes flashfloods**	**Flashfloods in Looc-Pagina (overflow)**	**Flooding in Brgy Can-upao**	**Believe that it is a "buhawe" waterspout in Mayana**
Unsang Tuiga	September 1, 1984	February 8,1990	November 30, 1990	Habagat Seasons (1980-90s)	May 17, 1999	July 11, 2005	March 16, 2011	August 30, 2011	September 2, 2011	October 11, 2011
Gikusgon (Impact and Strength	Signal No. 3 Super tyhpoon	Intensity 7	Signal No.3 Super typhoon	High rise of sea level	General alarm	245 cubic meter per second	Flow speed approximatel y 0.1 to 5 ft per second	Flow speed approxima tely 0.5 to 6 ft per second	Flow speed approximat ely 0.5 to 6 ft per second	Flow speed approximately 0.5 to 20 ft per second
Nakalas nga Kinabuhi o naangol	Est. 7 person injured/3 dead	Est. 13 person injured	Est. 5 person injured	None	wala	none	Wala	wala	wala	1 person missing
Nangaguba o nadaut mga propredad	BOHECO Office (now BFP), transformers, coco trees, fruit trees,	Partial damage Alejawan Bridge and cracks of buildings, pipes	Fishing boats, coco trees, farms	National roads, public building like Sanctuary Outpost, Tanod Outpost	Jagna Public Market, DQ Lodge, DQ Hardware, (12) Residences, dump truck	National road unpassable, 69 households	Irrigation Canal	Brgy Pagina 22 HHs affected home appliances, personal belongings	50 HHs Home appliances damage, backyard garden wash out	Agricultural crops
Naapektuhan nga infrastructura sa gobyerno ug pribado	seawall of Pagina	Collapse of Church Bell Tower/belfray, diversion of water sources	Unpassable roads/electri c posts	Coastal roads	Jagna Public Market, Waterworks pipes,	National roads, bridge, basketball court, BOHECO Post	Irrigation facility/ irrigation canal	Brgy Pagina Bailey type Quezon bridge, sea walls	Partial Damage Flood control at Can-upao-Bunga-Mar Bridge/ripra p	Mini impounding dam, 3 HHs Damaged
Kadaut sa Agrikultura	33 barangays Kahumayan, kasagingan ug kaumahan, kahayupan, kalubihan	50% of Rice paddies, agricultural farms	Kakahoyan, kasagingan, farm lands	Minor damaged	wala	122 Farm owners kabasakan, kasagingan, kaumahan, Kalubihan	Sitio Siling, Balili Kabasakan, vegetable gardens	wala	wala	Agricultural lands near the creeks

Kadaut sa Kalikupan	Pagkatumba-lukat sa mga kahoy	Destruction of heritage buildings, roads & cemetery	Fallen trees	During high tides water reaches to inland	Bush fire, air pollution	Mass earth movement	Diversion of waterways	Damage backyard gardens	Damage to plants and vegetable garden	Destroyed creeks, disturb flora and fauna
Bana-bana nga kantidad sa kadaut (gawas sa nakalas nga kinabuhi)	1,500,000	3,550,000	1,500,000	300,000	15,000,000	70,600,000	1,450,000	250,000	150,000	350,000

Timeline of Disasters happened in the Municipality of Jagna



MDRRM OFFICE ORGANIZATIONAL STRUCTURE:



THE FIVE- YEAR MUNICIPAL DISASTER RISK REDUCTION AND MANAGEMENT PLAN MATRIX:

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
DISASTER PREVENTION and MITIGATION PROGRAM										
Physical Infrastructure and Engineering Supports	Construction of Flood Control near lowland areas at BIT, Tejero	60,000					60,000	MDRRM Fund		MEO
	Inventory of canals and waterways concentrated in the barangays of Tejero, Poblacion, Can-upao	part of 60,000							1st Quarter of 2012 Partial of drainage starting Saksi going to BIT canal towards Pondol river (portion of BIT elementary will be covered); 2) partial construction of drainage system along side Capt. Goyo monument to Quezon St. going to Pagina-Calmayon Bridge	MPDC, MEO, Barangay Officials
	Continuous construction of Flood Control/covered canal near lowland areas at BIT, Tejero, Poblacion-Municipal Bldg. and Pondol area, Can-upao		400,000				400,000			
	Continuous construction of Flood Control/covered canal near lowland areas at Tejero, Poblacion-Municipal Bldg. and Pondol area, Can-upao			600,000			600,000		2014 - Continuation of 2013 projects; replacement of .30 RCCP to .60 portion at Villacastin; diversion of run off water from Villacastin going to Borja road	

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
Physical Infrastructure and Engineering Supports	Continuous dredging, declogging of canals, waterways (annual)		400,000	200,000			600,000	MDRRM FUnd	2013 - Declogging of national highway cross drainage from area of Tocles Abcede and expansion;widening of canal, uprooting of nipa @ Genes Abrea area; uprooting of nipa @ Renato Acera's portion (Can-upao); all canals and waterways	
	Continuous construction of Flood Control/covered canal near lowland areas at Tejero, Poblacion-Municipal Bldg. and Pondol area, Can-upao				200,000		200,000	MDRRM Fund	2015 - construction of canal @ Central School; and other waterways	
Knowledge Management	Conduct Training Needs Assessment (TNA) related to disaster	20,000					20,000	MDRRM Fund	Jul-12	MDRRMO
	Continuing Studies and Research	50,000					50,000	MDRRM Fund	Jul-12	MDRRMO
	Information and Education Campaign to reduce pollution thru schools, barangays							MDRRM Fund		MDRRMO

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
	Dissemination of emergency hotline nos. to all barangays constituents	10,000.00					10,000	MDRRM Fund	May-12	BFP
	Continuous updating of numbers		2,000				2,000			
Knowledge Management	Produce flyers for emergency contact number	30,000.00	2,000				32,000	MDRRM Fund	Sep-12	MDRRMO
	Establish radio program on climate change adaptation	5,000	5,000				10,000	MDRRM Fund	May-12	MDRRMO
GIS Enabled Mapping	- enhance disaster risks maps using manifolds - Installation of REDAS Software - E-copy of hazard maps	45,000.00	20,000				65,000	MDRRM Fund	Apr-12	MDRRMO
	Develop database and information	10,000	5,000				15,000	MDRRM Fund	Jun-12	MDRRMO
Program Planning, Monitoring and Evaluation	Conduct monitoring and evaluation	5,000					5,000	MDRRM Fund		MDRRMO
	Establish filing system of disaster related documentation and data of assessment reports and others	10,000					10,000	MDRRM Fund	Mar-12	MDRRMO

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
Networking, Linkaging and DRR Support System	Installation of INFO BOARD System thru SMS	x						MDRRM Fund		
Policy Advocacy Agenda	Enact Ordinance creating MENRO Office and staff.	x						MDRRM Fund		
	Enact Ordinance to require graduating student to plant trees as early as June as a requirement for graduation									
	Enact ordinance requesting barangays to install fire hydrant terminal chargeable to portion of their 5% LDRRM Fund	5,000								MDRRMC
	Enact Ordinance prohibiting building construction along river creeks and landslide prone areas.	x						MDRRM Fund		MDRRMC
	Integrating DRRM/CCA into Local Planning System * CLUP/CDP/ELA/AIP	x								MDRRMC

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
	Use of GIS thematic maps in the analysis	x								
	Strict implementation of pollution related ordinances.	x								ISWM TWG
	Strict enforcement of Ordinance Re: Illegal extraction of sand and gravel	x							Nov-12	MDRRMO
Planning Regimes	Formulate a Contingency Plan * Landslide Prone (Mayana)* Flood Prone (Tejero)	30,000						MDRRM Fund		MPDC/MDRRMO
	TOTAL	**280,000**	**834,000**	**800,000**	**200,000**	**0**	**2,114,000**			

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
RISK REDUCTION AND CLIMATE CHANGE ADAPTATION PROGRAM										
ICRM Sustainability	MPA maintenance		30,000	30,000	30,000	30,000	**120,000**	MDRRM Fund	Replacement of lost marker buoys	
	Construction of additional Guard House		40,000	40,000	40,000		**120,000**		Additional Guard Houses constructed	
	Monitoring and assessment of MPAs		15,000	15,000	15,000	15,000	**60,000**		Updated CRM assessment database	
Environmental Protection	River and Creeks Clean Up - Laca- Kinagbaan/ Bunga-Ilaya-Can upao-Bunga Mar/ Pangdan-Tejero/ Cantuyoc-Canjulao-Pagina/ Malbog-Tubod Monte-Pagina	12,000	12,000	12,000	12,000	12,000	**60,000**	MDRRM Fund	Rivers, creeks and waterways well maintained.	Barangay Council/ MDRRMC/O MEO
	Dredging and Declogging of Rivers and Estuaries: Bunga Mar/ Alejawan/ Naatang/ Ipil/Kinagbaan/ Pagina/ Canuba/ Calabacita/ Looc	100,000	100,000	100,000	100,000	100,000	**500,000**			
	Coastal and Underwater Clean up		12,000	12,000	12,000	12,000	**48,000**		15 Coastal Barangays and 8 MPAs	
	Expand coverage of waste collection aside from Metro Jagna (Cantagay, Ipil, Can-uba, Nausok, Tubod Mar, Naatang and Alejawan)		3,000	3,000	3,000	3,000	**12,000**	MDRRM Fund	Additional Coastal Barangays covered by waste collection.	ISWM/ TWG
	Established/operationalize Barangay MRF/Transfer								MRF established in each Barangay covered by waste	ISWM/ TWG

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
	Station								collection.	
Environmental Protection	Start 1st Phase of Proposed SLF		1,000,000	1,000,000			**2,000,000**		Sanitary Landfill completed and operational	ME/ISWM/ MO
	Improve water threatment on the water supply									JWS Management
	Conduct of Tree Growing Activities in Tubod Monte, Pangdan, Naatang, Buyog & Can-upao (Land Prep, seedling transport, tree planting, safeguarding, cultivating, monitoring, etc.)	500,000	100,000	100,000	100,000	100,000	**900,000**	MDRRM Fund	More areas planted to forest trees.	MDRRMO
	Partnership with BISU on Forest Assessment & Biodiversity Protection & Awareness	10,000					**10,000**	MDRRM Fund	Aug-12	MDRRMO
	Conduct environmental forum with DENR,BEMO,BFAR personnel	10,000					**10,000**	MDRRM Fund	Oct-12	MDDRMO
Public Health	Medical mission		150,000	150,000	150,000	150,000	**600,000**	MDRRM Fund	Patients at the Barangays availed of medical services	
	Supplemental feeding		30,000	30,000	30,000	30,000	**120,000**			
	Parents' class		10,000	10,000	10,000	10,000	**40,000**			
Agriculture Resiliency	Community Seed Banking (prime commodities)		50,000	50,000	50,000	50,000	**200,000**	MDRRM Fund		

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
	Livestock Protection and Maintenance (Vaccin & Biologics)		30,000	30,000	30,000	30,000	**120,000**	MDRRM Fund		
TOTAL		**632,000**	**1,582,000**	**1,582,000**	**582,000**	**542,000**	**4,920,000**			

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME/BUDGET NEEDED					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
DISASTER PREPAREDNESS AND RESPONSE PROGRAM										
Accreditation of Community Disaster Volunteers	Organize volunteers in times of Disaster Occurrences and Relief of Goods	30,000					30,000	MDRRM Fund	Apr-12	MDRRMO
	Expansion of volunteers to remaining 17 brgys.		50,000				50,000			
Capability Building	Capacity Building of First Aid Team(JEMRU), Response Team, Rehabilitation and Recovery & Relief Operation Team	150,000					150,000	MDRRM Fund		JEMRU/ MDRRMO
	Training for MDRRMC Team Task Force, Brgys Disaster Task Force, Volunteers	40,000	40,000	20,000			100,000	MDRRM Fund	Nov-12	MDRRMO/ JEMRU
	Enhancement of training for first aid and response team (JEMRU)		40,000	40,000			80,000			
Community Emergency Drill	Conduct of Earthquake Drill (LGU/School/Public Market)	20,000	20,000	20,000			60,000	MDRRM Fund	Earthquake Drill Conduct in July 2012	MDRRMO/ JEMRU

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME/BUDGET NEEDED					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
	Conduct Fire Drill and Tsunami Drill (Municipal Building/ Public Market	15,000	15,000	15,000			45,000	MDRRM Fund	Fire Drill Conduct in July 2012	MDRRMO/ JEMRU
Relief (Food and Non-food) Stockpiling and Financial aid to Disaster Victims	Financial Aid to Disaster Victims	150,000	70,000	70,000			290,000	MDRRM Fund		MDRRMO/MDRRMC
	Purchase of truck (elf)			500,000			500,000			
	Construction of Food Storage				200,000		200,000			
Purchases of Disaster Emergency equipment, Supplies and logistics	Ready and functional heavy equipments for landslide emergency clearing and safety of the people	50,000	50,000	50,000	50,000	50,000	250,000	MDRRM Fund	for rental	Municipal Engineering
	purchase of equipment van (Mini-van)		250,000				250,000			
	Purchase of waterpump		30,000				30,000			
	Purchase of two-way handheld radio	60,000	40,000				100,000	MDRRM Fund	Jul-12	MDRRMO
	Purchase of portable generator for emergency lights use	45,000					45,000	MDRRM Fund	Aug-12	MDRRMO
	purchase of Search light		35,000	25,000	10,000	10,000	80,000			
	Activation of 3-digit HOTLINE No.s	20,000					20,000	MDRRM Fund	May-12	MDRRMO
	Purchase of base and additional base radio	72,000					72,000	MDRRM Fund	Apr-12	MDRRMO

PROGRAM/ PROJECT	ACTIVITIES	TIME FRAME/BUDGET NEEDED					TOTAL BUDGET REQUIRED	BUDGET SOURCES	EXPECTED OUTPUT	RESPONSIBLE AGENCY
		2012	2013	2014	2015	2016				
	Medical Supplies and Rescue Equipments, Tools and Paraphernalia's	80,000	80,000	80,000			240,000	MDRRM Fund	May-12	MDRRMO
	Purchase of Jack Hammer			90,000			90,000			
	Purchase of Chain Block (2 tons)				40,000		40,000			
Early Warning System	Installation of Early Warning System * motor siren in metro Jagna * rain gauge stations * high sea level indicator * flood marker for monitoring	120,000	100,000				220,000	MDRRM Fund	Jun-12	MDRRMO
	Dialogue with Telecommunication Provider to augment cellular signals of Brgy Faraon, Canuba, Ipil, Can-ipol, Odiong, etc.		5,000				5,000	MDRRM Fund	Feb-12	MDRRMC/ Barangay Officials
	Prepare and install proper warning signages, caution signs, traffic signs	50,000					50,000	MDRRM Fund	Jul-12	MDRRMO
Maintenance of emergency equipments	Ambulance & MDRRMC motorcycle		75,000	20,000			95,000	MDRRM Fund		
	Gasoline & Poll Products		50,000	50,000			100,000			
	Rapair and maintenance of Fire trucks		50,000	20,000			70,000			
TOTAL		**902,000**	**1,000,000**	**1,000,000**	**300,000**	**60,000**	**3,262,000**			

OVER ALL SUMMARY OF BUDGET

Table 12: Five Year Summary of Financial Resources Needed by MDRRM Plan Per Program Basis

	PROGRAMS	BUDGETARY REQUIREMENTS		TOTAL BUDGET REQUIRED
		Internal Sources	External Sources	
1. Disaster Prevention and Mitigation Program				
	Physical Infrastructure and Engineering Supports	1,860,000		1,860,000
	Knowledge Management	124,000		124,000
	GIS Enabled Mapping	80,000		80,000
	Program Planning, Monitoring and Evaluation	15,000		15,000
	Networking, Linkaging and DRR Support System	0		0
	Policy Advocacy Agenda	5,000		5,000
	Planning Regimes	30,000		30,000
	SUB-TOTAL	**2,114,000**		
2. Risk Reduction and Climate Change Adaptation Program				
	ICRM Sustainability	300,000		300,000
	Environmental Protection	3,540,000		3,540,000
	Social Protection	0		0
	Public Health	760,000		760,000
	Agriculture Resiliency	320,000		320,000
	SUB-TOTAL	**4,920,000**		
3. Disaster Preparedness and Response Program				
	Accreditation of Community Disaster Volunteers	80,000		80,000
	Capability Building	330,000		330,000
	Community Emergency Drill	105,000		105,000
	Relief (Food and Non-food) Stockpiling and Financial aid to Disaster Victims	990,000		990,000
	Purchases of Disaster Emergency equipment, Supplies and logistics	1,217,000		1,217,000
	Early Warning System	275,000		275,000
	Maintenance of emergency equipments'	265,000		265,000
	SUB-TOTAL	**3,262,000**		
	GRAND TOTAL	**10,296,000**		**10,296,000**