

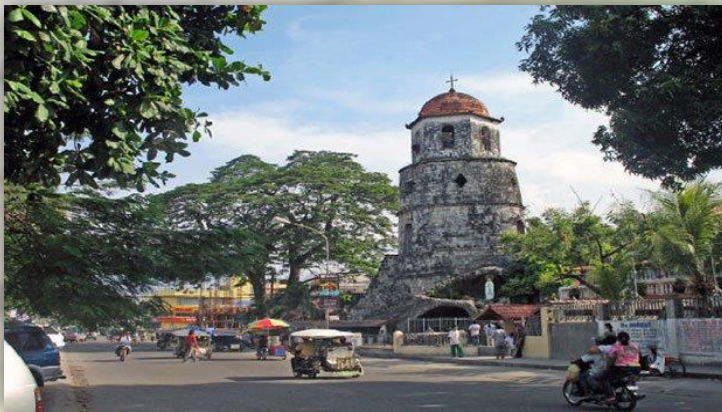
DUMAGUETE CITY

LOCAL CLIMATE CHANGE ADAPTATION PLAN

DISASTER RISK REDUCTION & MANAGEMENT PLAN (LCCAP-DRRMP)



2017-2022



The 6-Year Comprehensive Local Climate Change Adaptation Plan (LCCAP) and Disaster Risk Reduction and Management Plan is developed by the City Government of Dumaguete City and its constituents, with technical assistance from different Government & Non-government Agencies.

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Republic of the Philippines
Province of Negros Oriental
City of Dumaguete City



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MESSAGE



This 6-year Comprehensive Local Climate Change Action Plan – Disaster Risk Reduction and Management Plan (LCCAP-DRRMP) is crafted with the members of the Local Disaster Risk Reduction and Management Council of Dumaguete City, pursuant to the mandate of RA 9729 (Climate Change Act) and RA 10121 (DRRM Act).

This plan will serve as the guide of the Dumaguete City in the implementation of its executive and legislative agenda (ELA) and other relevant programs and projects of the city. Its significance is manifested in the worldwide initiative in mitigating disaster and climate related risks and adversely affecting in global scale.

We cannot deny the fact that Dumaguete City is not spared from this climatic variability due to its geographical location. In order to move forward in its efforts in the adaptation, mitigation program, priority interventions and projects were adopted and will be implemented in the next six years with the consideration of the historical trend and climate scenarios and projections.

With guidance of the Global Initiative on Disaster Risk Management of German Development Cooperation (GIZ-GIDRM), we are proud to say that the Gentle People of Dumaguete complied the certain guidelines set by the Climate Change Commission and Department of the Interior and Local Government (DILG) in the formulation Local Climate Change Action Plan (LCCAP) and Disaster Risk Reduction and Management Plan (DRRMP).

ATTY. FELIPE ANTONIO B. REMOLLO
City Mayor

ACKNOWLEDGMENT

Completing this Comprehensive Local Climate Change Action Plan and Disaster Risk Reduction and Management Plan was truly a marathon event, and we would not have been able to complete this journey without the aid and support of countless people over the past several months.

We would like to acknowledge the following City Government officials, City Department Heads and personnel, Organizations/Agencies, and individuals who played their indispensable roles in the successful completion of this 5-Year LCCAP-DRRM Plan of Dumaguete City, Negros Oriental, by giving their very invaluable and unwavering support all throughout the months of preparations, meetings and consultations for this project.

Foremost, we would like to express our sincere gratitude to the **Honorable Mayor Felipe Antonio B. Remollo**, for his encouragement and insightful comments, as well as logistical and moral support;

To the Honorable **Sangguniang Panglungsod** members, for their probing hard questions in support of legitimizing a good LCCAP-DRRM Plan for the City;

To **Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH – Global Initiative on Disaster Risk Management (GIDRM)**, for their invaluable contribution to the residents of Dumaguete City, Negros Oriental by providing technical assistance in the formulation of this Plan;

To the **City and Barangay Officials and LGU employees**, for their cooperation and unwavering dedication in providing us with additional inputs for the completion of this project;

To the staff and volunteers of the **Dumaguete City Local Climate Change Adaptation and Disaster Risk Reduction and Management Office (LDRRMO) / RESCUE 348**, for providing all the important information and data, and coordinating everything with government offices concerned throughout the months of this project to complete the CDRRM Plan;

And above all, to our Lord God Almighty, who was there to guide us all along and answered our prayers for the success of this endeavor, and to our fellow Gentle People of the City of Dumaguete who are in the frontlines of vulnerabilities when hazards strikes, and to whom this document is dedicated, thank you for being such gracious and welcoming host to GIZ-GIDRM and its representatives during the formulation of this 5-Year Local Climate Change Action Plan and Disaster Risk Reduction and Management Plan.

- Local Disaster Risk Reduction and Management Council

LIST OF ACRONYMS

ABC	Association of Barangay Captains
ACDV	Accredited Community Disaster Volunteers
AFP	Armed Forces of the Philippines
BDRRMC	Barangay Disaster Risk Reduction and Management Council
BFP	Bureau of Fire Protection
CaMReSC	Camp Management and Relief Service Command
CCA	Climate Change Adaptation
CEO	City Engineering Office
CENRO	City Environment and Natural Resources Office
CSWDO	City Social Welfare and Development Office
CLO	City Legal Office
CNDR	Corporate Network for Disaster Response
CP	Contingency Plan
CPDO	City Planning and Development Office
CTMO	City Traffic and Management Office
CTO	City Treasurer's Office
CVO	City Veterinary Office
DANA-SC	Damage Assessment and Needs Analysis Service Command
DENR-MGB	Department of Environment and Natural Resources - Mines and Geosciences Bureau
DRR	Disaster Risk Reduction
ENRO	Environment and Natural Resources Office
EWSC	Early Warning Service Command
FU	Foundation University
GAD	Gender And Development
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GIDRM	Global Initiative on Disaster Risk Management
GSO	General Services Office
HFA	Hyogo Framework of Action
LDRRMC	Local Disaster Risk Reduction and Management Council
LDRRMF	Local Disaster Risk Reduction and Management Fund
LDRRMO	Local Disaster Risk Reduction and Management Office
LCA	Local Contractors Association
LGU	Local Government Unit
MHSC	Medical and Health Service Command
NGO	Non-Government Organization
NORECO	Negros Oriental Electric Cooperative
NORSU	Negros Oriental State University
OCA	Office of the City Agriculturist
PCG	Philippine Coast Guard
PDRA	Participatory Disaster Risk Assessment
PDRRMF	Provincial Disaster Risk Reduction and Management Fund
PICE	Philippine Institute of Civil Engineers
PO	People's Organization
RA	Republic Act
RRSC	Response and Rescue Service Command
SU	Silliman University

I. INTRODUCTION

A. RATIONALE

The onset of decentralization in the Philippines created among government agencies and other institutions a multi-actor environment that necessitates cooperation with each other for the effective delivery of local services. In doing so, cooperation has become essential for an integrated approach to the achievement of functional responsibilities.

Foremost among the cooperation principles is harmonization. Harmonization has become a buzzword for development nowadays. Not very far from harmonization are almost similar terms such as convergence, whole of government approach to name a few. This means that at the LGU level there exists the possibility of working with political nemesis and at the NGA level of cooperating with agencies with overlapping mandates. These institutional challenges are coupled with the enormities of the impact brought about by climate change and disaster in general.

Given the scale of the impact and the bigness of the required resources to address climate change and disaster, harmonization

The primary goal of this CCA–DRR Plan is to improve the existing implementation practices of Dumaguete City on Climate Change Adaptation and Disaster Risk Reduction and Management in compliance to RA 9729 otherwise known as the Climate Change Act of 2009 and RA 10121 also known as the Philippine Disaster Risk Reduction and Management Act of 2010. Better partnership and working relationships among the departments within the local government unit, civil society organizations, private sector and community disaster volunteers (CDV's) is also priority of this comprehensive climate change adaptation and disaster risk reduction and management plan.

The plan encourages pragmatic contingency measures characterized by community self-reliance through partnership among public officials, their constituents, and the private sector. The plan is functional and action-oriented. The effectiveness of the Dumaguete City climate change adaptation actions and disaster preparedness largely depends on the skills of the locales, local resources and the nature and extent of involvement of the private sector and the general public. Assistance from the provincial, regional and national level authorities may be sought when the need arises.

WHY SHOULD CCA AND DRR BE CONCERNS OF LOCAL GOVERNMENT UNITS?

SECTION 16 OF REPUBLIC ACT (RA) 7160 – Every local government units shall exercise the powers expressly granted, those necessarily implied therefrom, as well as powers necessary, appropriate, or incidental for its efficient and effective governance, and those which are essential to the promotion of the general welfare. Within their respective territorial jurisdiction, local government units shall ensure and support, among other things, the preservation and enrichment of culture, promote health and

safety, enhance the right of the people to a balance ecology, encourage and support the development of appropriate and self-reliant scientific and technological capabilities, improve public morals, enhancement economic prosperity and social justice, promote full employment among their residents, maintain peace and order, and preserve the comfort and convenience of the inhabitants.

SECTION 24, LIABILITIES FOR DAMAGES, RA 7160 – Local government units and their officials are not exempt from liability for death or injury to persons or damage to property.

SECTION 11 (2), RA 10121

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.

SECTION 19, RA 10121

- Prohibited Acts – any person, group or corporation who commits any of the following prohibited acts shall be subjected to the penalties....
- (a) Dereliction of duties, which leads to destruction, loss of lives, critical damage of facilities and misuse of funds.

SECTION 2, RA 9729

The state shall integrate disaster risk reduction into climate change programs and initiatives.

The state shall strengthen, integrate consolidate, and institutionalize government initiative to achieve coordination in the implementation of plans and programs to address climate change in the context of sustainable development

SECTION 2, RA 9729

It is hereby declared the policy of the State to systematically integrate the concept of climate change in various phases of policy formulation, development plans, poverty reduction strategies and other development tools and techniques by all agencies and instrumentalities of the government.

SECTION 14, RA 9729

The LGUs shall be the frontline agencies in the formulation, planning and implementation of climate change action plans in their respective areas, consistent with the provisions of the Local Government Code, the Framework, and the National Climate Change Plan. Barangays shall be directly involved with municipal and city governments in identifying and implementing best practices and other solutions. City Government shall consider climate change adaptation, as one of their regular functions. Provincial governments shall provide technical assistance, enforcement and information management in support of city climate change action plans. Inter-local government unit collaboration shall be maximized in the conduct of climate-related activities

B. LOCAL GOVERNMENT UNIT PROFILE (*Ecological profile, demographic trends, current land use and development issues*)

GEOGRAPHIC PROFILE AND DEMOGRAPHIC TREND:

Dumaguete City is the capital of Negros Oriental. This second class city is bounded on the East by the Tañon Strait and the Mindanao Sea (Fig. 1), on the West by the municipality of Valencia, on the north by the municipality of Sibulan and on the South by the municipality of Bacong (Fig 2).

“Dumaguete” was coined from a Visayan word “Daggit” meaning “to snatch”. Muslim pirates’ marauding attacks were frequent. The city also exudes a charisma which lures visitors and keeps them for good. Hence, “Dumaggit” or “to swoop”, and the village was christened as Dumaguete. In 1890, Negros Island was divided into two politico-geographical units: Occidental and Oriental, the latter houses Dumaguete.



Fig. 1: Location Map of Dumaguete City

Upon the conclusion of the Filipino-American War in 1901, a civil government was established by the Americans in Negros Oriental. During World War II (1942-1945), Dumaguete was occupied by the Japanese Imperial Army. The combined forces of the US Army and Filipino Guerillas liberated the village on April 26, 1945. Three years later on June 15, 1948, RA 327 created the City of Dumaguete. In 1969, RA 5797 revised the charter of Dumaguete.

Dumaguete is a city in the Philippine province of Negros Oriental. It is the capital, principal seaport, and largest city of the province. According to the 2015 census, it has a population of 131,377 people. The city is nicknamed *The City of Gentle People*. To date the population of the City reaches 150,000 and can balloon up to 300,000 when students, working professionals and businessmen coming from adjacent provinces, cities and municipalities are counted.

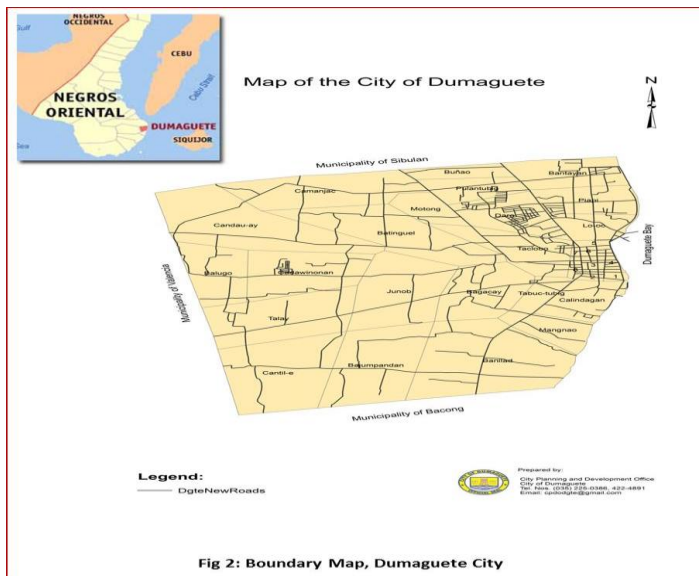
Dumaguete is referred to as a university town because of the presence of four universities and a number of other colleges where students of the province converge to enroll for tertiary education. The city is also a popular educational destination for students from the surrounding provinces and cities in the Visayas and Mindanao region. The city is best known for Silliman University, the country's first Protestant and the first American private university in Asia. There are also 12 elementary schools and 9 high schools. The city's student population is estimated at around 30,000.

The city attracts a considerable number of foreign tourists, particularly Europeans, because of easy ferry access from Cebu City, the availability of beach resorts and dive sites, and the attraction of dolphin and whale watching in nearby Bais City.

The power source of the city comes from the geothermal power plant in Palinpinon, Valencia. The city has redundant fiber optic lines and is a focal point for telecommunications. It is the landing point for fiber optic cables linking it to Manila, the capital of the Philippines, the cities south of Luzon, as well as to other major cities in southern Philippines.

ECOLOGICAL AND BIOLOGICAL PROFILE:

The city has a total land area of 3,426 hectares divided into 30 barangays. More than half of the area, 54% or 1,850 hectares, is classified as Residential. Agricultural areas cover 25% (856 hectares), Commercial is 8% (274 hectares), 6% (205 hectares) are Open spaces/Conservation, 4% (137 hectares) are Institutional, 2% (69 hectares) are used by Small-scale Industries, and 1% (35 hectares) are classified as Tourist Commercial.



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The soil types are: San Miguel-Taal Complex, San Miguel Fine Sandy Loam, Dauin Sandy Loam, and Isabela Clay. The first three are characteristically black, coarse, powdery and loose. Isabela Clay is found only in Barangays Bantayan, Looc and Piapi.

The city’s topography is generally flat. Almost all areas (93%) have slopes of less than 3%. The maximum slope of 5% is found in areas toward the municipality of Valencia. Consequently, the highest ground elevation which is about 100 meters (300ft) above sea level is also found at the Dumaguete-Valencia boundary (Fig. 2).

There are four soil types found in the city, namely: San Miguel-Taal Complex, San Manuel Sandy Loam, Dauin Sandy Loam and Isabela Clay. These are illustrated on Fig. 9. The soils in the city are generally fertile and areas that are highly fertile are found in Barangays Balugo, Cantil-e, Candau-ay, Camanjac and Cadawinonan. Areas which are highly susceptible to erosion, are found in barangays Cantil-e, Talay, Junob, Bajumpandan and Cadawinonan.

Studies conducted by the DCWD show that the geologic formations within Dumaguete consist of the following:

Table 1: Geological Formation within the City of Dumaguete.

Geologic Formation	% of Area
1. Recent Alluvium	83
2. Pliocene Quaternary Transition Belt	13
3. Pliocene-Quaternary Pyroclastic	4
Total	100

Source: Water Assessment and Development Plan 2000-2030, DCWD, 2001.

The study further states that Dumaguete is covered by Recent Alluvium covering 83% of the area. The formation underlies on an alluvium plain, which consists of unconsolidated boulders, cobbles, gravel, silt and clay.

The city has two seasons, namely: the dry and wet seasons. The wet season covers the period from June to November and the dry season starts from December to May and the hottest being April and May. Recent meteorological records, however, show variations to the wet and dry season.

Mangroves - Naturally grown mangroves species like bakhaw (rhizophora spp.) and Piapi (avecennia spp.) sparsely grow in Barangays of Banilad, Mangnao, Looc, Piapi and Bantayan. Banilad, Piapi and Bantayan are name of mangrove species which named after to the selected coastal barangays of Dumaguete, meaning this areas are abundant of this type of species before.

VULNERABILITIES, CURRENT LAND USE AND DEVELOPMENT ISSUES:

Economic Vulnerabilities

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
- Strong competition among cities as sites for BPOs	- Economic opportunities lost for other cities. - Young people leaving Dumaguete City and migrating to other cities and countries.	- Continue coordination private sector, universities and government agencies such as DTI and DOST in continuing to promote Dumaguete as BPO site citing the city as one of the country's top ten BPO locations. - Promote the city's Investment Code of 2009 to business community in and outside the city.
- Absence of Investment Promotion Plan; City government website not updated and maintained.	- None or inaccurate information about Dumaguete for prospective investors and tourists. - Economic losses. ^[L] _[SEP]	- Prepare and investment promotion plan; Assign office or personnel to activate and update website.

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
<ul style="list-style-type: none"> - High costs of electrical power supply. 	<ul style="list-style-type: none"> - Increased operating costs of business. - Potential investors have second thoughts about investing in the city. - Economic disruptions and losses. [SEP] 	<ul style="list-style-type: none"> - Provincial and city governments and private sector to negotiate with power producers/ distributors for a lower and affordable cost of electrical power supply.
<ul style="list-style-type: none"> - Absence of direct air transport link between Dumaguete and Mindanao. 	<ul style="list-style-type: none"> - Higher cost of doing business; - Higher travel costs between [SEP]Dumaguete and Mindanao. - Delays in the movement of goods [SEP]and services. - Limited number of goods traded. [SEP] 	<ul style="list-style-type: none"> - Request air transport companies for direct air transport from Dumaguete City to Cagayan de Oro City or Davao City and vice versa.
<ul style="list-style-type: none"> - Facilities and services for university town. 	<ul style="list-style-type: none"> - Housing facilities for students may not meet construction and sanitary standards. [SEP] - Petty crimes in and around educational institutions. [SEP] 	<ul style="list-style-type: none"> - City government to regulate the construction and operation of boarding houses or living quarters for local and foreign students. - Increased police visibility around campuses, recreation areas frequented by students and the business district. [SEP]
<ul style="list-style-type: none"> - Congested Public Market 	<ul style="list-style-type: none"> - Vehicular congestion along Colon and Real streets. [SEP] - Increased noise, air and wastewater pollution. [SEP] - Unsanitary conditions in public market. [SEP] - Decreased patronage of public market. [SEP] 	<ul style="list-style-type: none"> - City government to identify, build and operate other public markets. [SEP] - Amend city ordinance limiting the sale of meat, meat products and fish to the public market. [SEP]
<ul style="list-style-type: none"> - Culture of Tourism 	<ul style="list-style-type: none"> - Lack of appreciation by the community of the impact of tourism on the economy and jobs. [SEP] - Insufficient number of sanitary facilities for tourists. [SEP] - Unsightly garbage on streets. [SEP] - Abusive public transport driver and operators. [SEP] - People's lack of support of city's anti-littering program. [SEP] - Tourism promotion program not fully implemented. [SEP] 	<ul style="list-style-type: none"> - Information campaign for the community on the potentials of tourism and jobs. [SEP] - Construct modern sanitary facilities in or near tourism sites. [SEP] - Fully implement anti-littering city [SEP]ordinance including fines and imprisonment. - Coordinate tourism promotion [SEP]program with provincial government and travel industry stakeholders. [SEP] - Update and maintain data on tourism. [SEP]
<ul style="list-style-type: none"> - Decreasing food production in the city. 	<ul style="list-style-type: none"> - Idle productive agricultural lands. [SEP] - Inadequate capital resources 	<ul style="list-style-type: none"> - SB legislation enabling the city to use idle lands and to lease the same to farmers; [SEP]

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
	and technology for food production. - Prices of locally produced farm products no longer competitive.	- Implementation of tax on idle lands per Local Government Code.
Local Revenue Generation	- Low local revenue due to the city's outdated real property tax and market code; - Lost opportunities for increasing the delivery of public service due to low local revenue.	- Update and amend real property tax and market code. - Continue measures to improve collection of local revenue.

Physical Vulnerabilities

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
- Insufficient equipment and facilities for crime prevention and solution	- Delayed response - Ineffective security measures	- National PNP to provide equipment's and facilities
- Inadequate number of fire hydrant	- High impact on fire incidence	- Installation of additional hydrant
- Need of additional fire stations	- Inefficient peace and order and response time	- City Council ordinance to equip and fully operate the fire station in Barangay Daro
- Additional flood control measures along Banica River	- Widespread impact of flooding in the center center	- Construction of additional river control measures

Human/ Social Vulnerabilities

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
- Insufficient funds for families to meet basic needs.	-	- Conduct skills training activities and other income-generating activities.
- Inadequate access to opportunities for higher learning for the Youth and deserving students.	-	- Ordinance that provides a payback scheme to support more scholars; - Increase budget for the back-to-school program under the Local Council for the Welfare of Children; - Establish Dumaguete City College.
- Absence of facilities for coordinated team	-	- Ordinance requiring all barangays to establish recreational facilities

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
management of Child Abuse cases.		and more developmental and sports activities for the youth; ^[L] _[SEP] - Ensure functionality of Barangay Council for the Protection of Children; ^[L] _[SEP] - Establish a “Pink Room” in the city. ^[L] _[SEP]
Substance abuse.	-	An ordinance for the establishment and operation of special drug education center for OSY and street children DILG MC 2006-150.
Presence of abused women and children and children in Conflict with the Law.		An ordinance requiring barangays to organize and strengthen their Barangay Council for Protection of Children, Womens’ Committee and Juvenile Justice Committee as provided for in RA 9344, PD 603 & other children’s laws.
Lack of moral values.	-	Strengthen family solidarity and promote responsible parenthood.
Lack of awareness on gender and development issues.	-	- Full implementation of Gender and Development with corresponding budget as mandated by law (5%); - Strengthen the KALIPI organizations and City Federation.
Inadequate opportunities and benefits for Senior Citizens and Persons with Disabilities.		Implement the basic provision of RA 9994 and Magna Carta for PWD’s.
Absence/Insufficient number of Day Care Center in some barangays and repair of some Day Care Centers.	-	Construct additional day care centers and repair existing ones.
Absence of relocation site for disaster victims and those affected by government projects.	-	Provide relocation sites and construct Core Shelter houses.
- HEALTH		
High incidence of Dengue	-	- SP requiring barangay to implement 4 o’clock habit and participation in activities on dengue prevention and control. - Allocation of budget and training on dengue prevention and control. ^[L] _[SEP]
High incidence of STI and	-	- SP ordinance requiring mandatory

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
increasing threat of HIV/AIDS.		examination and social hygiene for high risk groups and commercial sex workers. -
Low accomplishment on FIC and PNC	-	- SP resolution requiring parents to submit children and pregnant women for immunization. [SEP] - SP resolution prohibiting “hilots” assist in [SEP] deliveries without [SEP] presence of RHMs. [SEP] - SP resolution inclusion [SEP] criteria for availment of health assistance benefits. [SEP]
Congested hospitals/ lack of hospital beds.	-	SP resolution for the setting up of a Primary Hospital.
Safe water supply.	-	SP adaption of PD 856 (Code on Sanitation of the Philippines)
NUTRITION		
- Continuous incidence of malnutrition in pre-school children [SEP] - Increasing incidence of malnutrition among pregnant mothers and women.	-	- SP resolution requiring parents to submit children for immunization. [SEP] - Inclusion criteria for awarding health [SEP] assistance benefits [SEP]

Natural Vulnerabilities

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
- Narrow riverbank of Banica River in the city central	- Increases frequency of flooding in the city central	- Flood lead time study and reliable flood early warning system in necessary
- Dumaguete City is a catch basin of water from the Municipality of Valencia	- Increases frequency of flooding in the city central	- Flood lead time study and reliable flood early warning system in necessary

Productive Assets Vulnerabilities

Priority Issues/Problems	Implications/Effects	Possible Interventions/ Policies/Program
- River Siltation	- Soil Erosion = Low productivity	- Policy on river bank protection
- Conversion of agricultural land to residential and commercial	- Agricultural product dependency to other sources	- Policy on the protection of existing agricultural land
- Flooding affect the productivity of people	- Loss income during disasters	- Effective EWS

C. PLANNING CONTEXT (LGU development priorities, Vision-Mission-Goal, LGU Planning context including existing and implemented climate change plans and programs)

VISION, MISSION AND OBJECTIVES OF DUMAGUETE CITY:

VISION:

Dumaguete City, a city of gentle people, envisions to become ecologically-balanced and peaceful city, a center of sustainable development, quality holistic education with self-reliant, socially responsible, morally upright and highly empowered people by 2022.

MISSION:

We exist to enable Dumagueteños attain high quality of life.

VALUES:

Values We Uphold

1. Transparency and Accountability in Governance
2. Principled Leadership
3. Inter-generational Responsibility
4. Spirituality and High Moral Standards
5. Discipline
6. Fairness
7. Holistic Political Maturity
8. Excellence in Public Service
9. Stewardship of the Environment
10. Excellence in Education

INDICATOR OF CLIMATE AND DISASTER RISK RESILIENT DEVELOPMENT SECTORS:

Table 2: Sectoral Indicator of Climate and Disaster Risk Resilient Development

<p>Economic Sector</p>	<ul style="list-style-type: none"> • Continue coordination private sector, universities and government agencies such as DTI and DOST in continuing to promote Dumaguete as BPO site citing the city as one of the country’s top ten BPO locations. • Promote the city’s Investment Code of 2009 to business community in and outside the city. • Prepare and investment promotion plan; Assign office or personnel to activate and update website. • Provincial and city governments and private sector to negotiate with power producers/ distributors for a lower and affordable cost of electrical power supply. • City government to regulate the construction and operation of boarding houses or living quarters for local and foreign students. • Increased police visibility around campuses, recreation areas frequented
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	<ul style="list-style-type: none"> by students and the business district. • City government to identify, build and operate other public markets. • Information campaign for the community on the potentials of tourism and jobs. • sustainable and viable livelihood and micro-enterprises • enhanced security of farmers as related to land tenure • Vibrant climate for economic opportunities
Social Sector	<ul style="list-style-type: none"> • Improved quality of life of the people in the City • 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 • Strengthen family solidarity and promote responsible parenthood.
Infrastructure	<ul style="list-style-type: none"> • Improved various climate resilient infrastructure projects to support economic, environmental, development administration, and social goals • Construct modern sanitary facilities in or near tourism sites. • Construction of additional river control measures
Environment	<ul style="list-style-type: none"> • Make the community environmentally-sound and responsive to climate change • Sustained, vibrant, rich and healthy environment. • Promote the use of renewable energy
Institutional	<ul style="list-style-type: none"> • GAD-oriented, morally upright, productive, and competent LGU officials and employees • Responsive and effective local legislation • Update and amend real property tax and market code. • Maximized collection of local revenues • Continue measures to improve collection of local revenue. • Promotion of transparency and customer satisfaction

PROPOSED URBAN FORM FOR SAFE URBAN SETTLEMENTS:

The trend alternative reflects the probable scenario of Dumaguete City 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. As a major trading center in the southeastern part of the Province of Negros Oriental, Dumaguete City would become the institutional and settlement center in of the Province. 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. Urban settlement or the residential districts of Dumaguete are classified into three, namely:

- **The Low Density Residential (R1)** - This is composed of 20-40 dwelling units per hectare. Low Density Residential are located in the following location:

Block 1 - Area bounded on the North by Banilad-Mangnao boundary; on the West by the Commercial Zone along Lamberto Macias Street (Dumaguete South Road); on the East by open space (OS) zone; and on the South by a commercial zone, Block 66.

Block 3a - Area bounded on the North by barangay boundary of Banilad-Bagacay and barangay boundary of Banilad-Mangnao; on the West by barangay boundary of Banilad-Bajumpandan; on the South by the Commercial Strip of San Isidro Road; and on the East by the commercial zone along Lamberto Macias Street (Dumaguete South Road).

Block 3b - Area bounded on the North by Commercial Strip of San Isidro Road; on the West by barangay boundary of Banilad-Bajumpandan; on the South by the municipal boundary of Bacong; and on the East by the commercial zone along Lamberto Macias Street (Dumaguete South Road).

Block 10 - Area bounded on the North by a commercial zone along Jose E. Romero Sr. Road (Dumaguete-Valencia Road); on the West by the municipal boundary of Valencia; on the East by the Commercial Strip of the Dumaguete Diversion Road; and on the South by the barangay boundary of Talay-Cantil-e.

Block 11 - Area bounded on the North by barangay boundaries of Talay-Balugo and Talay-Cadawinonan; on the West by the municipal boundary of Valencia; on the East by the Commercial Strip along Dumaguete Diversion Road; and on the South by the commercial zone along Jose E. Romero Sr. Road (Dumaguete- Valencia Road).

Additional Designated Areas: Along city or barangay roads in the agricultural districts within a depth of one hundred (100) meters on both sides reckoned from road-right- of way.

- **Medium Density Residential (R2)** – Composed of 41-70 dwelling units per hectare. Medium density will be found in:

Block 2 - Area bounded on the North by an institutional zone (St. Louis School); on the West by a commercial zone along the Lamberto Macias Street (Dumaguete South Road); on the East by a tourist commercial zone (C-3) along Dumaguete Bay, Block 29; and on the South by the barangay boundary of Mangnao- Banilad.

Block 9 - Area bounded on the North by the Rovira West Drive; on the West by a commercial strip along Dumaguete Diversion Road; on the East by commercial zone along Gov. Larena Drive; and on the South by the R-3 Block 8.

Block 12 – Area bounded on the north by Brgy. boundary of Batinguel- Camanjac; on the Southwest by brgy. boundary of Batinguel-Candau-ay; on the East by a commercial strip along Dumaguete Diversion Road; on the South by a commercial strip along Dumaguete Diversion Road.

- **High Density Residential (R3)** – 71 – up dwelling units per hectare. High density residential occupied 17 blocks in the entire City.

Block 4 - Area bounded on the North by the commercial zone along Jose E. Romero Sr. Road; on the West by barangay boundary of Bagacay and Junob; on the South by barangay boundary of Banilad and Bagacay and Banilad-Mangnao; and on the East by a commercial zone along Lamberto Macias Street.

Block 5 - Area bounded on the North by Dumaguete-Balugo Road; on the West by Blas Acuña Caro Road; on the South by a commercial zone along the Jose E. Romero Sr. Road; and on the East by Andres Martinez Lumjod Road.

Block 6 - Area bounded on the North by a commercial zone along Jose E. Romero Sr. (Dumaguete-Valencia) Road; on the West by commercial zone along Dumaguete Diversion Road; on the East by the barangay boundary of Junob- Bagacay; and on the South by the barangay boundary of Junob-Bajumpandan.

Block 7 - Area bounded on the North by Dumaguete-Balugo Road; on the West by Junob Barangay Road (Sto. Rosario Heights); on the East by Blas Acuña Caro Road; and on the South by the commercial zone along Jose E. Romero Sr. (Dumaguete-Valencia) Road.

Block 8 - Area bounded on the North by the Dr. Vicente G. Sinco (Dumaguete-Palipinon) Road and commercial strip (Dumaguete Diversion Road); on the West by the commercial strip along Dumaguete Diversion Road; on the East and South by Dumaguete-Balugo Road.

Block 13 - Area bounded on the North by the Banica River; on the West by the commercial zone along Dumaguete South Road and Canday-ong Road; on the East by the Dumaguete Bay; and on the South by Canday-ong Road.

Block 14 - Area bounded on the North by commercial zone along E.J. Blanco Drive; on the East by Tourist commercial zone and Block 34; and on the South by commercial zone along Gothong By-pass Road (Looc By-pass Road); and on the West by a commercial zone along Hibbard Avenue (Dumaguete-Airport Road).

Block 15 - Area bounded on the North by Mack Road; on the West by commercial zone along Hibbard Avenue (Dumaguete Airport Road); on the South by commercial zone along E. J. Blanco Drive; and on the East by a Tourist commercial zone, Block 28.

Block 16 - Area bounded on the North by commercial zone along E.J. Blanco Drive; on the East by commercial zone along Hibbard Avenue (Dumaguete Airport Road); and on the West by commercial zone along Veterans Avenue; and on the South by commercial zone V. Aldecoa Sr. Drive.

Block 17 - Area bounded on the North by commercial zone along L. Rovira East Drive;

on the East by the commercial and institutional zones along Hibbard Avenue (Dumaguete Airport Road); on the South by commercial zone E.J. Blanco Drive and institutional zones; and on the West by the commercial and institutional zones along the Veterans Avenue (National Highway).

Block 18 - Areas bounded on the North by Mojon Creek and the municipal boundary of Sibulan; on the East by a commercial zone along the Hibbard Avenue (Dumaguete Airport Road) and an institutional zone (Silliman University College of Agriculture and Marine and Aquatic Resources); on the South by commercial zone L. Rovira East Drive; and on the West by the commercial zone, Block 65.

Block 19 - Area bounded on the North by the San Jose Extension, on the West by commercial zone along Gov. Larena Drive; on the South by a commercial zone along V. Locsin Street; and on the East by a commercial zone.

Block 20a - Area bounded on the North by commercial zone along E.J. Blanco Extension; on the West by commercial zone along Gov. Larena Drive; on the South by the San Jose Extension Road; and on the East by a commercial zone along Diego de la Viña Street.

Block 20b – Area bounded on the North by commercial zone along E.J. Blanco Road; on the West by commercial zone along Diego de la Viña Street; on the South by V. Aldecoa Sr. Drive and on the East by a commercial zone of Veterans Avenue (National Highway)

Block 21a - Area bounded on the North by Mojon creek and the municipal boundary of Sibulan; on the West by commercial zone along Gov. Larena Drive; on the South along Commercial Strip by L. Rovira West Drive; and on the East by a commercial zone along the Veterans Avenue.

Block 21b – Area bounded on the North along commercial strip by L. Rovira West Drive; on the West by commercial strip along Larena drive; on the South by commercial strip along E.J. Blanco Road and E.J. Blanco Road Extension; and on the East by commercial strip along Veterans Avenue.

Block 69 – Area bounded on the North by the commercial and institutional zones along commercial strips of Gov. Larena Drive and Miciano Road; on the West by Andres Martinez Lumjod Road (Bagacay barangay road) to Banica River (spillway); on the South by a commercial zone along Jose E. Romero Road (Dumaguete-Valencia Road) and Block 31; and on the East by a commercial strip along Cervantes Street (Mayor Jose Pro Teves Street).

PROPOSED POLICIES FOR A RISK SENSITIVE ZONING ORDINANCE

The City Council of Dumaguete enacted City Ordinance No. 82 Series of 2013 entitled; “The 2013 Zoning Ordinance of Dumaguete City.” The ordinance is promulgated pursuant to the provision of RA 7160, otherwise known as the Local Government Code of 1991, RA 7279 also known as Urban Development and Housing Act of 1992, and RA 2264 otherwise known as the Local Autonomy Act.

Since the ordinance is crafted in 2013, the Local Government Unit of Dumaguete City did not yet consider the latest guidelines of HLURB on the mainstreaming DRR and CCA in Comprehensive land Use Plan (CLUP). However, the City Disaster Risk Reduction and Management Council initiated in drafting a certain provision and guidelines on how to mainstream DRR and CCA in the CLUP. The proposed policies and guidelines below are subject for scrutiny and approval of the City Council of Dumaguete in order to come a risk sensitive zoning ordinance for the City..

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 Participatory Vulnerability and Capacity Assessment (PVCA), Climate and Disaster Risk Assessment (CDRA) and in the formulation of the disaster risk 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 risk 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 city.

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.

D. PLANNING APPROACH *(Planning framework, guiding principles, stakeholders and engagement, Scope and Duration)*

PLANING FRAMEWORK AND GUIDING PRINCIPLES:

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, modeling 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 a 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 3.)

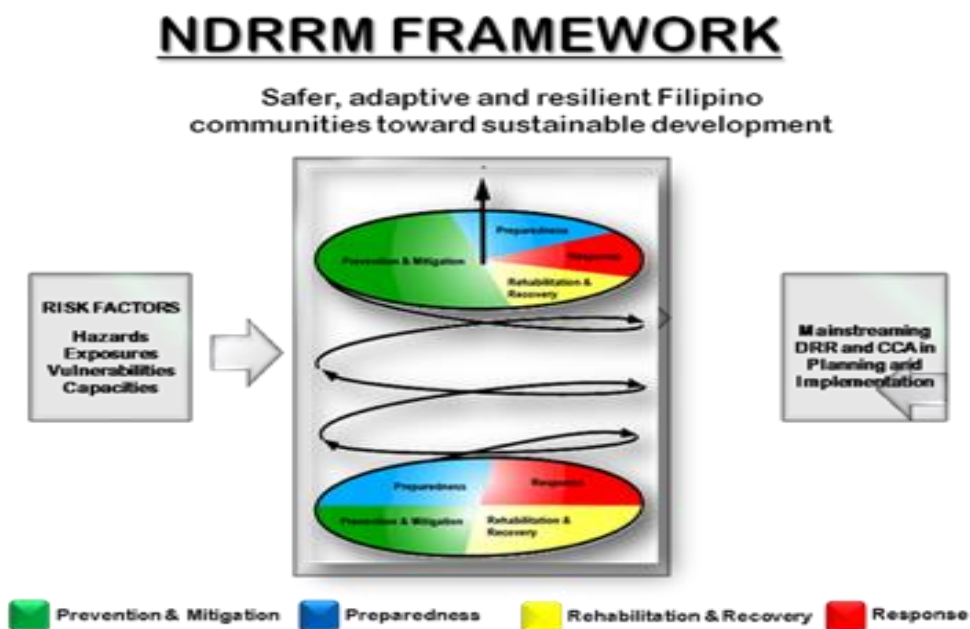


Figure 3: National Disaster Risk Reduction and Management Framework

STAKEHOLDER ENGAGEMENT IN THE CCA-DRR PLANNING PROCESS:

In the formulation of 5 Year LCCAP-DRRM plan, there are four specific objectives that were agreed upon by the participants in order to attain a quality results and better guidelines in the formulation of the plan. And these are as follows:

1. To Consolidate the Barangay Climate Change Action Plan and Disaster Risk Reduction and Management plans and initiatives of the BLGU as integral component of Comprehensive Local Climate Change Adaptation Action and Disaster Risk Reduction and Management Plan
2. To conduct a comprehensive Climate and Disaster Risk Assessment (CDRA) to be more objectives in the local climate projection, proactive disaster risk management approaches and budget prioritization for the 70% of Local Disaster Risk Reduction and Management Fund.
3. To consolidate the programs and project of the every department of the LGU related to CCA-DRR and allocate funds from LDRRM Fund.
4. To formulate the comprehensive Local CCA - DRR Plan of the Dumaguete City, Negros Oriental.

The 3-day MDRRM Planning and workshop is also a product of various strategies, activities and processes that have been undertaken by the LGU through its Local Climate Change Adaptation and Disaster Risk Reduction and Management Council (LCCAP-DRRMC) in order to gather data as required by CDRA being the pre-requisites in the formulation of comprehensive LCCAP-DRRM plan.

Below are the governance-driven strategies and evolutionary planning processes and activities, to wit:

Barangay level:

1. Consultation on hazard exposure was conducted to 30 barangays to identify the highly exposed barangays to natural hazards;
2. Identify and prioritized CCA-DRR interventions for specific barangays based on approved comprehensive BDRRM Plans of 30 Barangays of Dumaguete City
3. Identification of hazard specific evacuation centers in the 30 barangays was facilitated and incorporated in this plan as pro-active measures on disaster preparedness and response initiative in the future;
4. Updating of population, household, special sectors information per barangay for programs and project prioritization consideration of this comprehensive LCCAP-DRRM plan of Dumaguete
5. The vulnerability assessment was undergone a thorough process of barangay level consultation to surface significant issues directly from constituents of concerned barangays.

Municipal Level:

A three-day planning process was agreed upon by the CDRRMC to formulate the local climate change adaptation action and disaster risk reduction and management plan (CCA-DRR). The three day planning process was composed of discussions on the salient provisions of RA 10121, RA 9729 and international agreements such as Paris Climate Change Agreement (COP 21) and Sustainable Development Agenda (SDG). It was followed by the review of Barangay based CCA-DRR consultations and a workshop on Climate and Disaster Risk Assessment, review and finalization of CCA-DRR structure of the LGU and analysis of the financial capacity of the City to finance the climate change and disaster risk reduction related issues that surface during the barangay based CCA-DRR consultation and CDRA workshop output. After the review of the barangay consultation and CDRA workshop result has been consolidated, the 5 year Local CCA-DRR planning process was on board with the guidance of the financial capacity that they have in the formulation of a feasible and efficient CCA-DRR plan implementable in the current structure that the LDRRMC has been agreed upon.

Below are the 5- steps in developing this climate change action and disaster risk reduction and management plan and budget:

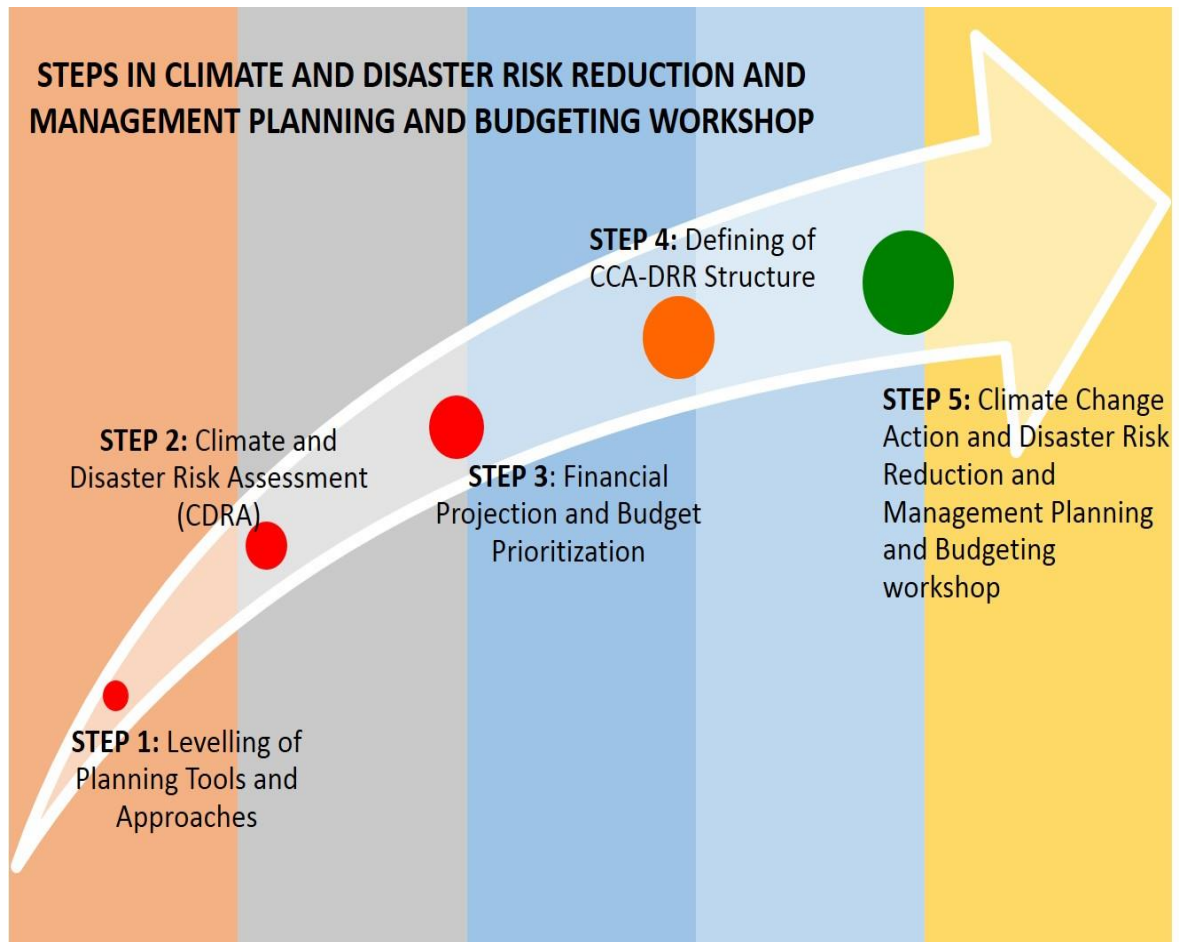


Figure 4: Steps in CCA-DRR Planning and Budgeting Process

SCOPE AND DURATION:

The 6-year Local CCA and DRRM Plan (2017 – 2022) focuses on the 3 major programs namely; 1) Disaster Prevention and Mitigation Program which focuses on the climate smart infrastructure support program of climate change adaptation and disaster risk reduction plan, which constitute 45% of its 5% LDRRM Fund 2) Climate Change Adaptation Program focusing agriculture resiliency support, health and well-being management support, and environmental protection and management. This project and activities under local climate change adaptation program (LCCAP) constitutes 25% of the 5% LDRRM fund of the LGU. And 3) the Disaster Preparedness and Program – the highlights of this program is on the purchase of disaster response and rescue related equipment and establishing early warning system and its maintenance and operation protocol, capability building support, supplies and inventories and other programs or projects of similar nature and consideration necessary. The disaster preparedness programs constitutes 30% of the 5% LDRRM Fund of Dumaguete City, Negros oriental

The members of the City LCCAP-DRRM Council shall continue the strengthening themselves organizationally and technically to ensure their effectiveness in overseeing the CCA -DRR Plan of the City.

The Local Climate Change Adaptation and Disaster Risk Reduction and Management Office (LCCAP-DRRMO) thru it's executive officer is responsible in implementing this plan as well as building coordination to other agencies and department within the LGU, and provide networking and linkage building to national government agencies and non-governmental organization to ensure that this plan was carried out based on its agreed time table. The LDRRMO executive office shall be organizationally and technically strengthened also to handle with all priority activities envisioned by the 6-year LCCAP-LDRRM Plan.

The Barangay Climate Change and Disaster Risk Brigade or the Accredited Community Disaster Volunteers (ACDV's) based on RA 10121, shall be properly organized and eventually institutionalized through the close monitoring of Barangay Disaster Risk Reduction and Management Committee (BDRRMC) with the technical assistance of LCCAP-DRRMO.

II. CLIMATE AND DISASTER RISK ASSESSMENT (CDRA) PROFILE

The climate of the Philippines is tropical monsoon dominated by a rainy season, dry season and a relatively cool season that dominates in December to February. The southwest (summer) monsoon brings heavy rains to most parts of the archipelago from May to September, whereas the northeast (winter) monsoon brings cooler and drier air from December to February with moderate to heavy rains in the eastern part of the country. Manila and most of the lowland areas are hot, sunny and dusty from March to April. However, temperatures rarely rise above 37°C (99°F) in Manila. The highest temperature recorded in the Philippines was 42.2 °C in Tuguegarao in Cagayan Valley on 29 April 1912 and on 11 May 1969. The absolute minimum temperature of 3.0 °C was recorded in January of 1903 in the mountain city of Baguio.

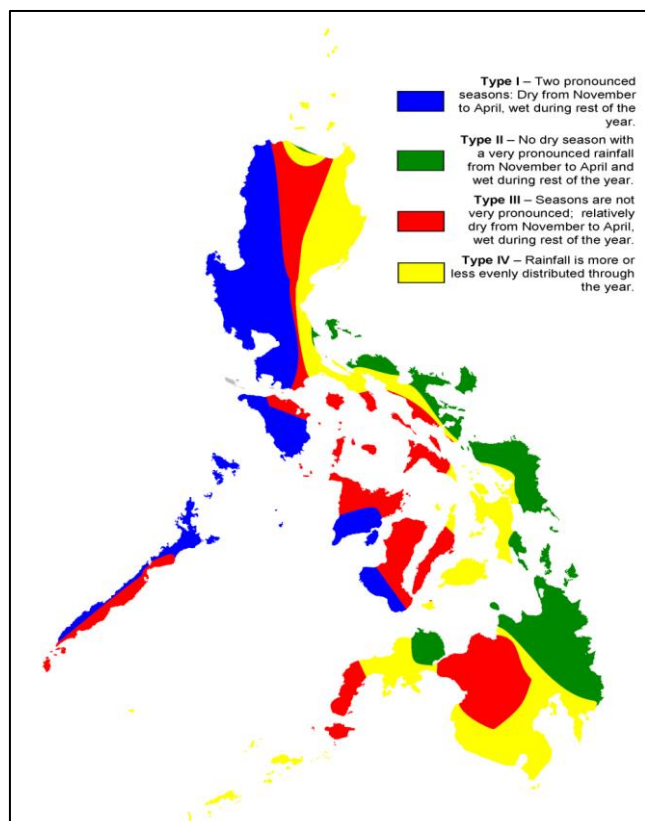


Figure 5: Climate of the Philippines based on Modified Coronas classification (Source: Climatological and Agro-meteorological Division, PAGASA).

Annual average rainfall ranges from as much as 5,000 mm (200 in.) in the mountainous east coast section of the country to less than 1,000 mm (39 in.) in some of the sheltered valleys. Monsoon rains, although hard and drenching, are not normally associated with high winds and waves. But the Philippines sit astride the typhoon belt, and the country

suffers an annual onslaught of dangerous tropical cyclones from July through December. An average of 19 to 20 tropical cyclones fall under the Philippine Area of Responsibility (PAR). Tropical cyclones are especially hazardous for northern and eastern Luzon and eastern Visayas, but highly urbanized Metro Manila gets devastated periodically as well. Based on the modified Coronas classification, the climate of the Philippines is divided into four (4) categories based on the rainfall distribution shown in Figure 5.

i. IDENTIFIED CLIMATE AND NON-CLIMATE RELATED HAZARDS AND THEIR IMPACTS TO THE LGU

The Twin Watershed:

Banica river is a river on the island of Negros Oriental located in the LGUs of Valencia, as head water, Dumaguete City and Municipality of Sibulan as downstream catch basin of the twin rivers. It is the tributary of of the Ocoy river which originates from the Lake Balinsasayao. The river traverses the municipality of Valencia, City of Dumaguete and Municipality of Sibulan where it empties into the Bohol Sea.

Banica River watershed:

The main Banica River runs for about 18 kilometers with its upstream located in Valencia and discharges through Dumaguete City towards the Mindanao Sea. Its headwaters are situated at an elevation of around 1,200 m (3,900ft) AMSL and significantly drops to 100 m (300ft) AMSL in about 11.6 kilometers within the town of Valencia (slope of about 0.09 or generally gradual slope), then from 100 meters to its mouth in roughly 7 kilometers through Dumaguete City. Note: all values were extracted from available maps provided by the LGUs of Negros Oriental Province, the Municipality of Valencia and the City of Dumaguete.

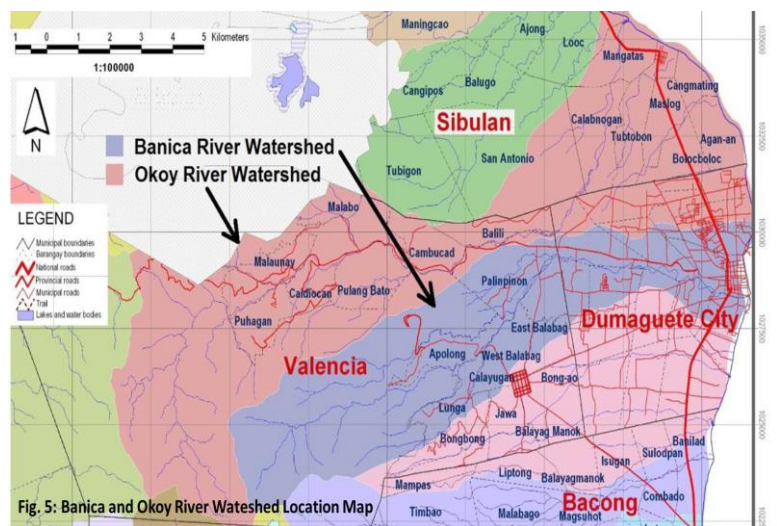


Figure 6: Map of Oco and Banica Watershed

A major tributary to Banica River is the Banao-Diot River which runs for about 7.8 km before merging with the latter at Barangay West Balabag in the town of Valencia. Other small tributaries that merged with Banica River within the town of Valencia are mostly ephemeral in nature.

Okoy River watershed:

The Okoy River watershed, which is actually an allied watershed of Banica River system, drains down to a catchment area of roughly 72 Sq km. Okoy River runs for about 27 kilometers. Similar to Banica, its headwaters are located in the town of Valencia, its course passes partly through Dumaguete City at Barangays Candau-ay and Camanjac and eventually discharges to the Mindanao Sea through the town of Sibulan. Headwaters elevation is around 1,200 m (3,900ft) AMSL with a general average river slope of 0.04.

As per geophysical features of the two watersheds, flooding can be characterized as rapid onset (Flash flood) at the upstream to midstream part, becoming moderate at its lower sections. Obvious manifestation of flood response is the river channels' slope and the channel bed which is composed mainly of boulders at the upstream portion, and large rocks and stones, to cobblestones at the midstream part. Interviews conducted in some places revealed that river level rises are quite rapid particularly at the upstream and midstream portions. Also floods lasted for just a few hours at many areas for both watersheds as was observed during the passage of TS SENDONG in 2011.

Type of Hazards that occurred and most likely to occur

Monsoon Winds/Typhoons/ Flooding:

There are two types' of monsoon winds in the Philippines, the southwest monsoon (May-October) or known as the "**Habagat**", and the dry winds of the northeast monsoon (November-April) called the "**Amihan**". The Habagat season is characterized by cold and hot humid weather, frequent heavy rainfall and typhoons with 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. In the case of Dumaguete City, Amihan or the northeast monsoon has turned out to be the scariest and most devastating monsoon winds based on the last three years experienced by the city. On February 07, 2009, the effects of Amihan produced a low pressure area (LPA) with heavy rainfall which caused a major flooding in Dumaguete City affecting 12 barangays of the City, namely: Tabuc-tubig, Bagacay, Junob, Cadawinonan, Batinguel, Candau-ay, Balugo, Taclobo, Poblacion 8, Buno, Camanjac and Poblacion 2. The main reason why the flood became devastating was the occurrence of heavy rainfall happened during high tide which caused a massive increased of flood level to an estimated height of 1 meter or higher in some areas. Based on the disaster timeline result of the LDRRMC, 60 houses were totally damaged and around 1000 families affected. Infrastructure and Agricultural damage was significant, and based on the report made by the city LDRRMO the flood caused around 25 Million pesos worth of damage to the city.

Community Asset Assessment Result

Table 3: Human and Social Capital Asset Assessment

Affected Barangays	Hazards		Exposures		Vulnerabilities				Existing Capacities
	% of Flooded Areas in the Brgy	Flood Water level	Population	No. of Families	Affected Population	Affected Families	% of Affected Population	% of Affected Families	
Dumaguete City, Negros Oriental (12 out of 30 Barangays)									
Candau-ay	50%	1 m	6,000	1,200	4,550	910	76%		BDC
Junob	10%	0.5 m	900	180	870	174	97%		BDC
Bagacay	10%	0.5 m	2,170	434	1,700	340	78%		BDC
Balugo	10%	0.5 m	1,115	223	160	32	14%		BDC
Batinguel	20%	0.6 m	2,355	471	1,905	381	81%		BDC
Taclobo	15%	0.5 m	4,510	902	1,960	392	43%		BDC
Tabuc-tubig	30%	0.7 m	500	100	420	84	84%		BDC
Brgy Pob 8	45%	0.8 m	2,000	400	1,800	360	90%		BDC
Cadawinonan	25%	0.6 m	1,605	321	990	198	62%		BDC
Buñao	30%	0.6 m	800	160	750	150	94%		BDC
Camanjac	25%	0.6 m	3,320	664	795	159	24%		BDC
Brgy Pob 2	20%	0.6 m	1,150	230	1,070	214	93%		BDC

Community Asset Assessment Result

Table 4: Natural Capital Asset Assessment

Affected Barangays	Hazards		Exposures		Vulnerabilities				Existing Capacities
	% of Flooded Areas in the Whole Brgy	Flood Water level	Agricultural Land (# of Has.)	Pasture Land	Affected Agriculture Crops	Affected Livestock	% of Affected Agriculture	% of Affected Livestock	
Dumaguete City, Negros Oriental (12 out of 30 Barangays)									
Candau-ay	50%	1 m	Corn 5 Has Rice 0.6 Ha		Corn 1 Ha Rice 0.6 Ha		20%		
Junob	10%	0.5 m	Corn 3 Has Rice 0.5 Ha		Corn 0.5 Ha Rice 0.5 Ha		17%		
Bagacay	10%	0.5 m							
Balugo	10%	0.5 m	Corn 3 Has		Corn 0.5 Ha		17%		
Batinguel	20%	0.6 m	Corn 2 Has Rice 3.5 Has		Corn 0.4 Ha Rice 3 Has		20%		
Taclobo	15%	0.5 m							
Tabuc-tubig	30%	0.7 m							
Brgy Pob 8	45%	0.8 m							
Cadawinonan	25%	0.6 m	Corn 3 Has		Corn 0.6 Ha		20%		
Buñao	30%	0.6 m							
Camanjac	25%	0.6 m	Corn 4 Has Rice 6 Has		Corn 0.8 Ha Rice 6 Has		20%		
Brgy Pob 2	20%	0.6 m							

Like many coastal cities and municipalities in the Philippines, Dumaguete City is now frequently visited by typhoons particularly in the months from October to February where the northeast monsoon is passing through the entire province of Negros Oriental. From 2011 up to the present, three significant typhoons passed through the city and the province which brought with it significant damage to the area.

On December 17, 2011 almost 50% of the entire population of the city was affected by floods brought about by Typhoon SENDONG. Total estimated damages from the typhoon on infrastructures, agricultural crops and livestock, livelihoods, lifelines and properties was around 60 million pesos as recorded by the Local Disaster Risk Reduction and Management Council (LDRRMC) of Dumaguete City.

Almost a year later, Typhoon PABLO struck Dumaguete City on December 4, 2012. The typhoon hit with maximum sustained winds of 175 kilometers per hour that day at around 5 pm and the force of the wind was such that it tore away sheets of metal from the roofs of houses as well as boards and signage's from private establishments and stores. More than 300 electrical post and over 300 trees were toppled that blocked most road networks around the city, resulting in a total power black-out that lasted more than a week. With the heavy rains and strong winds, agricultural crops and fruit bearing trees were uprooted and wiped out. More than 1,400 families were affected, 73 houses totally damaged and over 1,300 homes considered partially damaged. Again the total cost of damage from Typhoon PABLO was estimated around 40 million pesos.

One month after Typhoon PABLO hit Dumaguete City, on January 3, 2013, Tropical Depression (TD) AURING also demonstrated its effects on the City. This time stormy weather brought by TD AURING caused the passenger ship "Zamboanga Ferry" of George and Peter (GP) Lines to lose control while attempting to docked at the pier. The passenger ship, because of the strong waves and high winds, was pushed to shallow waters near the boulevard and got grounded on the shallow portion of the Dumaguete port that resulted to five hours of rescue operations to evacuate a total of 228 passengers and crew members from the distressed inter-island vessel. All of the people on board were accounted for, however one of them was declared dead on arrival (DOA) at a hospital in the City due to a pre-existing heart condition. For two days, 83 remaining transit passengers were catered to at the evacuation center in the port area and provided with dry clothes, food and other basic needs by the LDRRMO, concerned agencies and the private sector.

Results of MGB Assessment to Flooding

Based on results of the field geo-hazard survey conducted by the Mines and Geosciences Bureau (MGB-Region VII) in February 25, 2006, Dumaguete City is vulnerable to flooding as shown in Table 3. There are several barangays that are susceptible to flooding which is described as to the type and the cause of the hazard. Based on recent events however, more brgys are now experiencing medium to heavy flooding. MGB will need to update its assessment.

Table 5: MGB assessment results of the thirty (30) Barangays Susceptible to Flooding

	Barangay Name	Remarks/ Recommendations(flooding)
1.	Bajumpandan	Low flood depth of up to 0.5m is rarely experienced in the barangay. Flooding only occurs along roads due to the lack of drainage canals. Surface water accumulated and flooded the streets reaching a depth of about 0.3m. Recommendations: Construction of drainage canals along roads.
2.	Bantayan	Flash flood with low turbidity commonly occurs. Low flood depth of up to 0.5m is rarely experienced in the barangay. High flood depth of >1m is rarely experienced at Purok 7. Flooding in Purok 7 damaged three (3) houses along the Buñao Creek with depths reaching above the head. This was the first time in 17 years that the Purok experienced such flooding. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content) in Buñao and Pulantubig Creeks
3.	Bunao	Flash flood with low turbidity rarely occurred for the past 42 years. High flood depth of >1m is rarely experienced at the barangay. The barangay was affected by mudflow last February 7, 2009. Water level was waist-deep in San Lorenzo, and San Juan areas caused by the inundation of Bunao Creek. It was the first time in 42 years. The 24 hours rain resulted to 4 hours of flooding. Three houses were affected in Sibulan and Agan-an. The mudflow reached to about 3 ft. Recommendation: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increase turbidity (soil content) of Bunao Creek.
4.	Cantil-e	Flash flood with high turbidity rarely occurs. Low flood depth of up to 0.5m is rarely experienced in the barangay. Cantil-e Creek (dry creek) experiences flooding with garbage, mostly plastics. Floodwater is consigned along the river valley. Recommendations: Construction/rehabilitation of drainage canals.
5.	Piapi	Low flood depth of up to 0.5m is seasonally experienced in the barangay. Hibbard and EJ Blanco Streets (crossing) are perennially flooded during rainy seasons mainly because of clogged drainage. Flooding reaches knee-deep and lasts for 1-2 hours. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). De-clogging of drainages is recommended. Improve drainage system
6.	Pulantubig	Flash flood with low to high turbidity commonly occurs. High flood depth of >1m is rarely experienced at the barangay. Flooding is caused by the overflowing of Pulantubig Creek and Motong Creek. Worst flooding in the barangay occurred last February 2009 where almost 80% of the barangay was flooded. Pulantubig Creek was almost shoulder-level in depth. Flooding lasted for 8 hours. It was noted that 15 years ago Pulantubig Creek also overflowed. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Implement contingency planning for flash flood hazard.
7.	Daro	Flash flood with low turbidity commonly occurs. Low seasonal flood depth of up to 0.5m to rarely high flood depth of >1m is experienced in the barangay. 20 years ago, flooding was waist-deep. Last February 2009, 90% of the barangay was flooded with >1m flood depth. Flooding was caused by almost 2 days of continuous rainfall. The mud was about 3 inches.

	Barangay Name	Remarks/ Recommendations(flooding)
8.	Bagacay	Low flood depth of up to 0.5m is rarely experienced in the barangay. High flood depth of >1m is seasonally experienced along Banica River during heavy and continuous rains. Recommendations: Develop an early warning device/system. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Identify relocation sites for residents living along Banica River.
9.	Balugo	Flash flood with low turbidity occurs along Banica River affecting 18 households. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Identify relocation site for residents living at Purok Santol which is affected by flash flood. Constant communication and updates with Barangay Cadawinonan on geo-hazard situation.
10.	Banilad	Flash flood with low turbidity rarely occurs. Low flood depth of up to 0.5m is rarely experienced in the barangay. Rainwater accumulation along roads was observed with depth reaching about 0.2m. The absence of drainage canals causes the rainwater to accumulate and flow along the roads. Recommendations: Construction/rehabilitation of drainage canals along roads is recommended.
11.	Brgy Poblacion 1	Low flood depth of up to 0.5m is rarely experienced in Purok Ubos. Recommendations: Develop an early warning device/system. Constant communication and updates with Barangay Poblacion 2 on geo-hazard situation. Organize BDCC.
12.	Junob	Moderate flood depth of 0.5-1m rarely occurs at the barangay particularly during the heavy rains on February 2009. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Identify relocation site for residents living in the barangay. Constant communication and updates with Barangay Bagacay on geo-hazard situation.
13.	Cadawinonan	Low flood depth of up to 0.5m is seasonally experienced in the barangay. Moderate flood depth of 0.5-1m occurs at Purok Kawayan and Purok Narra. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Identify relocation site for residents living at Purok Parcel and Purok Narra/Kawayan. Constant communication and updates with Barangay Junob on geo-hazard situation. Regular dredging of Banica River to prevent diversion of surface run-off during heavy rains/typhoon. Provide riprap/flood mitigating measures along Banica River to prevent overflow.
14.	Calindagan	Flash flood with high turbidity rarely occurs. Low flood depth of up to 0.5m is seasonally experienced in the barangay. Purok Sampaguita and Purok Orchid experienced flooding of about 1m in depth along the river bank. Storm surge during typhoon Ruping (about 10 years ago) devastated houses along the coast. Recommendations: Rehabilitation of dikes along the river banks.
15.	Camanjac	Low flood depth of up to 0.5m is seasonally experienced in the barangay. Flooding is caused by the overflowing of Okoy River and Banica River resulting to moderate flooding of Purok Matinabangon, Makiangayon,

	Barangay Name	Remarks/ Recommendations(flooding)
		Malinawon, Maisan, and Makuguihon with depths ranging from 0.5-1m.
16.	Candau-ay	Low flood depth of up to 0.5m is seasonally experienced in the barangay. Flooding is due to the overflowing of Banica River, Okoy River and Tongo Creek affecting Purok Rosal, Yellow Tops and Zones 1,2,and 4.
17.	Tabuc-tubig	Flash flood with high turbidity rarely occurs. Low flood depth of up to 0.5m is seasonally experienced in the barangay. Recommendations: Construction/rehabilitation of drainage canals along roads and construction of dikes along river banks.
18.	Lo-oc	Low flood depth of up to 0.5m is seasonally experienced in the barangay particularly during strong rains. Low lying areas such as Zone 2, 6 and 7 are prone to flooding. The entire barangay was flooded during the Feb. 6 flooding incident reaching depths of about 0.5-1m. Recommendations: Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Provide appropriate drainage system in flood prone areas (low lying area). Constant communication and updates with Barangay Oblation and Barangay 5 on geo-hazard situation.
19.	Mangnao-Canal	Flash flood with low turbidity rarely occurs. Low flood depth of up to 0.5m is also rarely experienced in the barangay. Flooding is due to the lack of drainage canals. Recommendations: Construction/rehabilitation of drainage canals
20.	Motong	Low flood depth of up to 0.5m is experienced at the barangay proper. Flooding particularly affects Purok Mabugnawon and is caused by the overflowing of NIA Irrigation. High flood depth of >1m experienced at Purok Bayanihan is caused by the overflowing of Batinguel River.
21.	Brgy Poblacion 2	Low flood depth of up to 0.5m is seasonally experienced in the barangay during heavy rains and typhoon. Recommendations: Develop an early warning device/system. Constant communication and updates with Barangay Poblacion 3 on geo-hazard situation. Re-activate BDCC.
22.	Batinguel	Low flood depth of up to 0.5m is seasonally experienced in the barangay proper. High flood depth of >1m is experienced at Purok 1, 3, 4, and 5. High flood depth is also experienced in Banica River.
23.	Brgy Poblacion 3	Low flood depth of up to 0.5m is seasonally experienced in the barangay particularly during heavy rains. Recommendations: Develop an early warning device/system. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content).Constant communication and updates with Barangay Poblacion 2 / City Disaster Coordinating Council on geo-hazard situation. Improve drainage system along flood prone areas in the commercial district.
24.	Brgy Poblacion 4	Flooding with depth of less than 1m. Recommendations: Develop an early warning device/system. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content).
25.	Brgy Poblacion 5	Flash flood with moderate turbidity rarely occurs. Low flood depth of up to 0.5m is seasonally experienced in the barangay particularly during heavy rains. Floodwater subsides readily after 3-4 hours. During the February 7 incident, it was the first time that the run-off coming from higher grounds

	Barangay Name	Remarks/ Recommendations(flooding)
		flooded the barangay. Flooding is due to drainage problem. Recommendations: Develop an early warning device/system. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Recommend provision of appropriate drainage system.
26.	Brgy Poblacion 6	Low flood depth of up to 0.5m is experienced in the barangay particularly during heavy rains. During the February 7 flooding incident, it was the first time that flood depth reached a depth of 0.5-1m and lasted for 3-5 hours. Flooding is due to drainage problem. Recommendations: Develop an early warning device/system. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Recommend for improvement of drainage facility. Constant communication and updates with Brgy. Poblacion and Barangay 06 on geo-hazard situation. Reactivate BDCC.
27.	Brgy Poblacion 7	Low flood depth of up to 0.5m is seasonally experienced in the barangay particularly during heavy rains. Recommendations: Develop an early warning device/system. Identify evacuation site. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content). Identify relocation site for residents living along Banica River. Constant communication and updates with Barangay Taclobo on geo-hazard situation. Organize BDCC.
28.	Taclobo	
29.	Brgy Poblacion 8	Flooding with less than 1m. Recommendations: Develop an early warning device/system. Observe for rapid increase/decrease in creek/river water levels, possibly accompanied by increased turbidity (soil content).
30.	Talay	Recommendations: Constant communication and updates with Barangay Junob on geo-hazard situation.
It should be noted that these susceptibility ratings were arrived at as of this field assessment. However, the rating could advance (e.g., from low to moderate, and moderate to high) as the mass movement progresses. Hence, the MGB constantly recommends strict and continuous monitoring by the barangays.		

Source: MBG-7 Geo-hazard Assessment 2006

Earthquake and Tsunami:

Nearly two months after being devastated by Tropical Storm SENDONG, Dumaguete City in Negros Oriental was one of the areas where the magnitude 6.9 quake that hit the Visayas region was strongly felt on February 05, 2012 at around 11:45am. The quake registered Intensity VII in Dumaguete City according to the National Disaster Risk Reduction and Management Council.

The degree and extent of damage was significant, with most of the damage sustained during the initial earthquake. The hardest hit were the towns of Tayasan, Jimalalud, La Libertad, and the city of Guihulngan in Negros Oriental. Several houses, buildings and major bridges collapsed, while others sustained damages. The earthquake also caused big cracks on major highways and triggered numerous landslides burying houses and people. Reported places where landslides occurred were Brgy Solongon in La Libertad and Brgy Planas in Guihulngan.

The Philippine Institute of Volcanology and Seismology (PHIVOLCS) issued a level 2 tsunami alert, indicating that the public should be on the lookout for "unusual waves", but did not call for any evacuation. Despite this, most residents of Dumaguete City made a mad rush for higher ground to the mountain town of Valencia believing there was going to be a Tsunami. This turned out to be unfounded.

Local Climate Change Scenario of Dumaguete City, Negros Oriental:

Climate change is happening now. Evidences being seen support the fact that the change cannot simply be explained by natural variation. The most recent scientific assessments have confirmed that this warming of the climate system since the mid-20th century is most likely to be due to human activities; and thus, is due to the observed increase in greenhouse gas concentrations from human activities, such as the burning of fossil fuels and land use change. Current warming has increasingly posed quite considerable challenges to man and the environment, and will continue to do so in the future. Presently, some autonomous adaptation is taking place, but we need to consider a more pro-active adaptation planning in order to ensure sustainable development.

What does it take to ensure that adaptation planning has a scientific basis? Firstly, we need to be able to investigate the potential consequences of anthropogenic or human induced climate change and to do this, a plausible future climate based on a reliable and accurate baseline (or present) climate must be constructed. This is what climate scientists call a climate change scenario. It is a projection of the response of the climate system to future emissions or concentrations of greenhouse gases and aerosols, and is simulated using climate models. Essentially, it describes possible future changes in climate variables (such as temperatures, rainfall, storminess, winds, etc.) based on baseline climatic conditions.

German Development Cooperation-Global Initiative on Disaster risk Management (GIZ-GIDRM) develop a methods on how to downscale global climate model into local climate projection. The climate change scenarios outputs (projections) are an important step forward in improving our understanding of our complex climate, particularly in the future. These show how our local climate could change dramatically should the global community fail to act towards effectively reducing greenhouse gas emissions. This will also help the local government unit to have a better programs and services in their local climate actions and disaster risk reduction and management plans.

Many municipalities and cities in the Philippines are interested in having a climate change data customized to their locality. This applies especially if these Local Government Unit (LGUs) have diverse topography (e.g. lowlands and mountains) like the case of Dumaguete City in Negros Oriental.

Below are the results of local climate change projection of the City of Dumaguete, Negros Oriental in the following scenarios:

1. Precipitation Changes – The graph below, downscaled global climate model disagree to some extent about the future trends for rain in the City of Dumaguete. Low confidence in prediction. No increase in annual rain until the middle of the century (~2,500mm). Trends for extreme rain events cannot be deduced from the models:

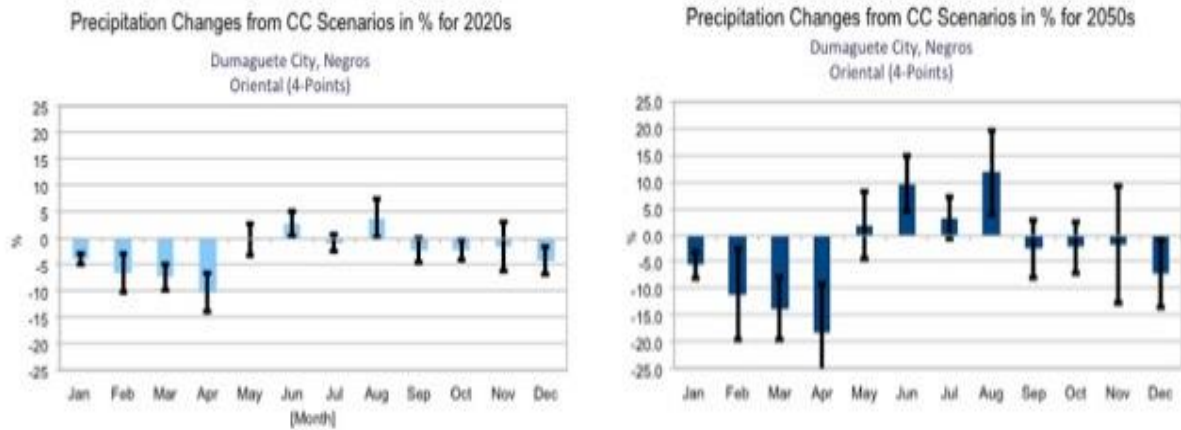


Figure 7: Precipitation Changes from Climate Change Scenarios in % for year 2020 and 2050 respectively for Dumaguete City, Negros Oriental

2. Maximum Temperature – Temperature increase of more or less 1 degree Celsius until 2020s are very likely and about 2 degree Celsius until 2050s in Dumaguete City. Little direct relevance for natural disasters, but probably for other aspects (water supply, agriculture, health).

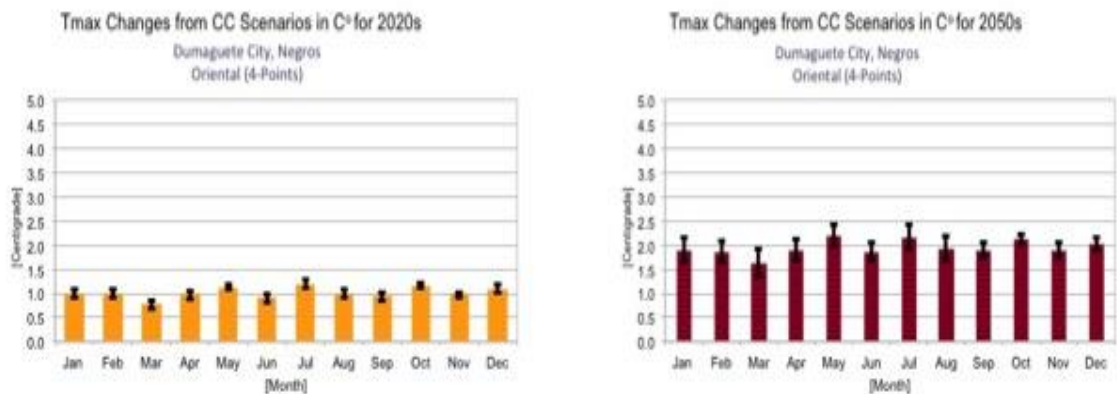


Figure 7: Maximum Temperature from Climate Change Scenarios in degrees Celsius for year 2020 and 2050 respectively for Dumaguete City, Negros Oriental

- Sea level Rise – According to the IPCC it is very likely that mean sea level rise will contribute to upward trend in extreme coastal high water levels in the future. There is high confidence that locations currently experiencing adverse impacts such as coastal erosion and inundation will continue to do so in the future due to increasing sea levels, all other contributing factors being equal.

For Dumaguete City up to 0.85 centimeters sea level rise per year may be possible, but it is most likely less. This may increase tsunami and storm surge heights and inundation area.

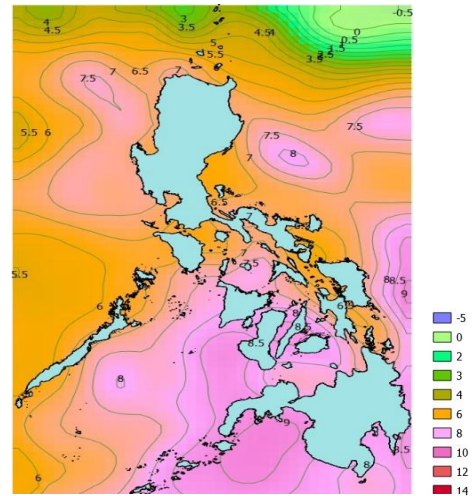


Figure 9: Philippines Average Observed Sea level Rise in mm/year

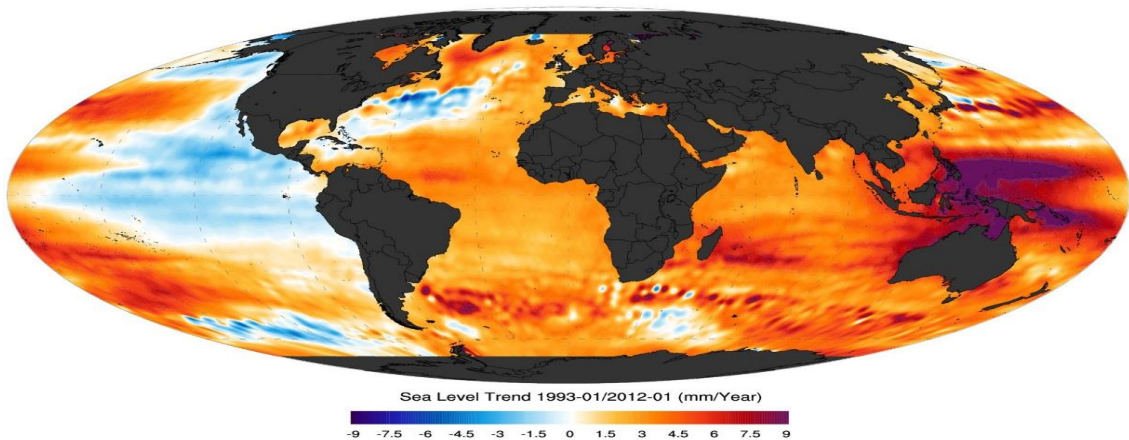


Figure 10: Satellite based Sea Level Trend by National Oceanic and Atmospheric Administration (NOAA)

These climatic variability may lead public health diseases outbreak, pest infestation to agricultural crops and some environmental problem. In Dumaguete City the scenarios below are most likely to happen:

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 Dumaguete are dengue fever, diarrhea 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.

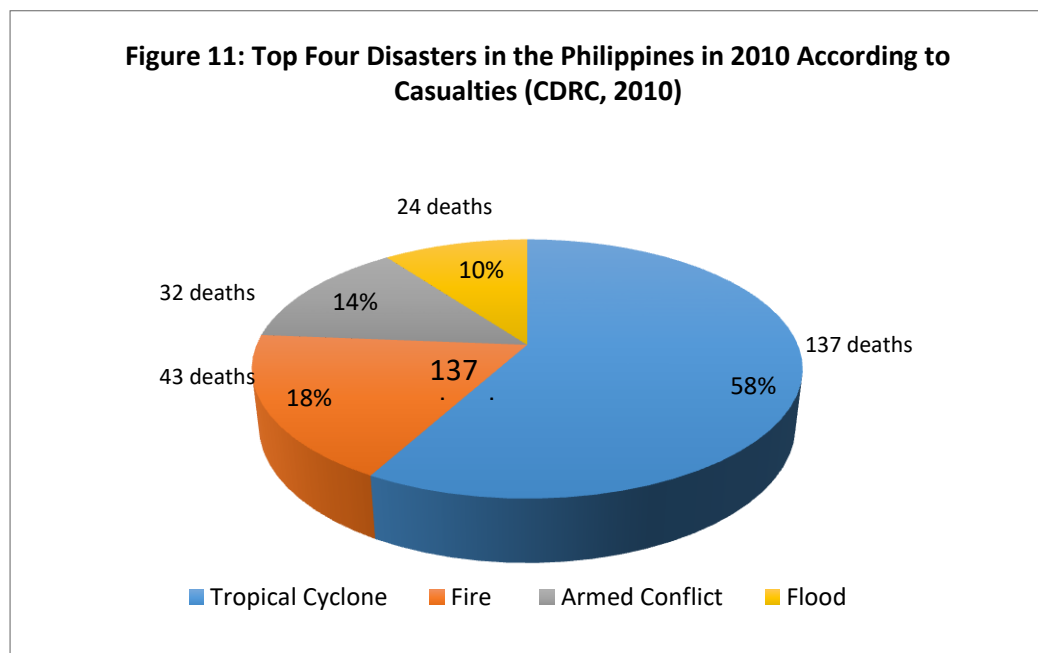
Typhoid is a common worldwide bacterial disease, transmitted by the ingestion of food or water contaminated with the feces of an infected person, which contain the bacterium *Salmonella enterica*, serovar Typhi. The bacteria then perforate through the intestinal wall and are phagocytosed by macrophages. 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.

Urban informal Settlements Fire:

The ability to make fire is one of society's earliest and most essential innovations, but fire poses a significant threat when it gets out of control (Alam and Baroi, 2003, p.35). The impact of fire is frequently severe and has a devastating impact on its victims. Fires which affect the poorest of the poor are especially damaging; those people who are most vulnerable to the impact of fires yet least well equipped to deal with them (Ibem, 2011, p.27). Informal settlements (or slums) are widespread in the urban areas of many developing countries. Slums are particularly vulnerable to the risks posed by many disasters and are often home to impoverished communities who are frequently the poorest and most marginalized urban population (Pharoah, 2009, p.105)

The issue of fires in informal settlements is global, with large numbers of fire incidences reported in countries throughout the world. However, 95% of the 300,000 or more deaths attributed to fire related burns per year, are from low and middle-income countries (World Health Organization, 2011, p.iv). Existing literature has succinctly depicted the threats developing countries face in the forms of disasters such as floods. However, urban fires (particularly in informal settlements) are often disregarded or only mentioned in passing. The extent to which fires pose a threat to the poorest demographic of society is inadequately documented and therefore poorly understood, particularly in Asia which is home to the largest number of the world's slum dwellers (UN-Habitat, 2003, p.246).

Fire disasters in the Philippines are estimated to have affected 94,875 people in 2010. The Philippines Disasters report (2010), indicates that fires were the second highest cause of casualties from a disaster with 43 deaths (CDRC, 2010). What the report fails to show is any explanation of what constitutes a disaster and distinctions between different types of fires such as urban or wild fires. Figure 11 shows the distribution of fatalities from disasters in 2010 in the Philippines. It can be seen that fires cause nearly twice as many deaths as flooding.



Records of Dumaguete City Fire Department from 2010-2015, electrical fire ranks first among fire incidents that occurred in the city. It was followed by structural fire, vehicular and grass fires incidence particularly during summer seasons. A total of 18 fires cases were recorded in the city for the month of January to March in year 2015 alone with costs of damage on properties pegged at Php 359-500 thousand pesos.

Grass 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 sub-urban barangays of Dumaguete City. Measures to increase resiliency includes continuous conduct of IEC and prohibits burning of farm wastes.

ii. ELEMENTS, SECTORS, AND INSTITUTIONS EXPOSED TO CLIMATE CHANGE IMPACTS:

Human Assets Exposed to Climate Change Impacts:

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

Social Assets Exposed to Climate Change Impacts:

- 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

Economic Assets Exposed to Climate Change Impacts:

- Dependency on service related jobs such as pedicab driver, kargador and sidewalk vendors
- 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 Assets Exposed to Climate Change Impacts:

- 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
- Limited landline telephone communication or erratic signal for mobile phones

- Water transmission and distribution lines destroyed by flash floods
- Electric posts and distribution lines destroyed by storm and flash flood
- Shortage of tools needed to maintain livelihoods or lack of protection from hazards

Natural Assets Exposed to Climate Change Impacts:

- 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

Productivity Assets Exposed to Climate Change Impacts:

- 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 commercial and industrial infrastructures
- Low productivity
- Loss of marketable products

iii. SUMMARY AND FINDINGS OF VULNERABILITY ASSESSMENT (Exposure, sensitivity and adaptive capacity)

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES									
SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
Physical	Roads	Quality and Length of the Road	CEO and brgy. Official	National Road Along Dgte south road within brgy Calindagan, Mangnao & Banilad (4 kms);	National Road along Dgte south road within this area is prone to damage due to over flooding of run –off water coming from Lagnasan creek & run –off water coming from Dgte-Valencia road & Junob creek.	DPWH, CEO & Barangay Officials	Retrofitting of existing roads, construction of climate sensitive road and paving of road shoulder/ construction of slope protection	Following the basis of standard specifications for road construction with regular maintenance work & vegetation control.	CEO & DPWH
	Roads	Quality and Length of the Road	CEO and brgy. Official	National road - Dgte-airport road from junction V. Aldecoa Drive going north up to L. Rovira West Drive, Bantayan (2 kms);	This road section is prone to damage due to over flooding of run off water coming from Looc creek.	DPWH, CEO & Barangay Officials	Retrofitting of existing roads, construction of climate sensitive road and paving of road shoulder/ construction of slope protection	- Following the basis of standard specifications for road construction with regular maintenance work & vegetation control.	CEO & DPWH
	Roads	Quality and Length of the Road	CEO and brgy. Official	National road- Dgte north road from Km 0+000 fronting Capitol Area going north passing Brgy Daro (2 kms);	This road section is prone to damage due to run off water from Capitol grounds.	DPWH, CEO & Barangay Officials	Retrofitting of existing roads, construction of climate sensitive road and paving of road shoulder/ construction of slope protection	Following the basis of standard specifications for road construction with regular maintenance work & vegetation control.	CEO & DPWH

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
Physical	Roads	Quality and Length of the Road	CEO and brgy. Official	Other interior roads-part of Bagacay, Batinguel, Candau-ay, Canday-ong, Motong, Pulantubig, Daro, Bunao, Banilad, Piapi, Bantayan & Slaughterhouse road (10-15 kms)	This road section is prone to damage due to run off water & over flowing of Banica River, Mojon Creek, Pulantubig Creek & Lagnasan Creek.	DPWH, CEO & Barangay Officials	Retrofitting of existing roads, construction of climate sensitive road and paving of road shoulder/ construction of slope protection	Following the basis of standard specifications for road construction with regular maintenance work & vegetation control.	CEO & DPWH
Physical	Drainage and Canals	Quality and Length of Drainage and Canal	CEO DPWH brgy. Officials	Unsuitable, old & existing drainage canals (Poblacion area & other brgys);	Cannot accommodate the present volume of rainfall due to climate Change. Flood water will overflow from the drainage canal and damage the existing road.	CEO, CPDC Barangay Officials (BDRRM)	Retrofitting of existing drainage canals and Construction of bigger drainage canals based on projected climate change scenario.	- Improvement of drainage and regular declogging of canals - Drainage master plan.	DPWH, CEO, Barangay
Physical	Drainage and Canals	Quality and Length of Drainage and Canal	CEO DPWH brgy. Officials	Undefined waterways in Brgys Banilad, Mangnao.	-flood water coming from Lagnasan Creek will spread out along Dgte slaughterhouse road towards the Dget south	CEO, CPDC Barangay Officials (BDRRM)	-Define the waterway of the Lagnasan creek passing through the upper portion of	- Construction of boulder dike along the defined waterway towards	DPWH, CEO, Barangay

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
					road due to the undefined waterways at the downstream side going towards the eastern part of Brgys Mangnao & Banilad.		Brgy Banilad passing along Banilad Slaughterhouse Road and crossing the Dgte south road towards the eastern part of Brgy Banilad.	the shoreline.	
Physical	Drainage and Canals	Quality and Length of Drainage and Canal	CEO DPWH brgy. Officials	Undefined waterways Daro-Motong-Pulantubig areas.	Flood water & run off water coming brgy Batinguel & Camanjac area will spread out in Motong road & larena Drive causing flooding on the northern west side of EJ Blanco Extn., particularly at the vicinity near Silot residence.	CEO, CPDC Barangay Officials (BDRRM)	Define the waterway created by the run off flood waters from Batinguel & Camanjac areas that caused flooding at Motong & Pulantubig areas that will connect to Pulantubig Creek.	- Construction of boulder dike along the defined waterway towards the shoreline.	DPWH, CEO, Barangay
Physical	River/ Flood control	Quality, Length & height of river/ flood control	CEO,CPDC & Brgy Officials	Gaps in between existing boulder along both sides of banica river & southern side of ocoy river within the boundary of Dumaguete city	Extreme Flood water will exit in these gaps causing flooding on various brgys along these waterways	CEO, CPDC Barangay Officials (BDRRM)	Continuance construction of boulder dike and additional height construction on the existing boulder dike.	- Completion of river control construction along Banica & Ocoy Rivers	DPWH, CEO, Barangay
Physical	Shoreline Protection	Quality and length of shoreline	CEO and Brgy Officials	Along the coastal areas of Brgys Bantayan, Piapi, Looc, Brgy 5, Brgy	This areas are prone of storm surges and possible tsunami's.	CEO and Brgy Officials	Additional construction and Extension of Rubble Masonry seawall	- Following the DPWH standard and specification for seawall	CEO/CPDC/ Brgy Officials

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
		protection		4, Tinago, Canday-ong, Mangnao and Banilad			with R.C. wave deflectors	construction	
Physical	Government / Private Building	Current state and condition	CEO and Local Building Officials	Church, chapels, schools, public and private buildings.	Within commercial, residential & tourist-commercial districts that are prone to flood, storm surges, and tsunamis.	CPDC, CEO/Bldg Officials	Retrofitting of all structures	- Strict implementation of National Building Code & Zoning Ordinances	CEO/Local Bldg Officials, CPDC (Zoning), LCE
Social	Health and Well-being	Increased rainfall; modified temperature (high humidity)	CHO/ Brgy Health Center	Very young school children; Immuno-compromised; Brgys Daro, Bagacay, Banilad, Batinguel, Pob 8, Piapi, Taclobo, Candau-ay: crowded, congested areas with high population density.	Presence of breeding sites for mosquitos; Increased mosquito population; Increased Dengue cases	BHC/CHO	Search and destroy of breeding sites. Impregnation of mosquito nets. Screening of windows at public elem schools. Provision of iec	- Decreased mosquito breeding sites;	BHC/CHO
Social	Health and Well-being	Increased rainfall; modified temperature	CHO/ Brgy Health Center	At risk population wading in flooded water	Presence of infected water from rats' urine.	BHC/CHO	IEC on prevention and control of leptospirosis; Wearing of PPEs	0-decreased case of leptospirosis	BHC/CHO

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
		(high humidity)					for people who have to wade in flooded waters		
Social	Health and Well-being	Increased rainfall; modified temperature (high humidity)	City Nutrition Ofc; Brgy Nutrition Workers	pre-school & school children, pregnqnt & lactating mother, senior citizens & PWDs	Increased malnourishment specifically by wasting & underweight due to inadequate/poor food distribution & unsafe water supply.	RHUs through BNWs & other health personnel	Dietary supplementation to vulnerable groups; Micro-nutrient supplementation; Nutrition Advocacy	- Malnutrition incidence among vulnerable groups minimized;	30% of QRF
Social	Safety and security to Natural Hazard	Current state of safety and security of the People to natural hazard	CDRRMO/ BDRRMC/ DILG	<ul style="list-style-type: none"> - Level of Knowledge and Awareness of the risk hazards - Capability to Respond to threats to specific hazards - Skills and Training <p>The city is threatened by 5 hazards: floods/flashfloods , fire, typhoons/ storm surge, earthquake/tsuna</p>	<ul style="list-style-type: none"> - Most of the constituents have insufficient awareness and knowledge in disaster risk reduction in general - Lack of personnel for disaster preparedness of response - Additional equipment for disaster preparedness and response is needed. - Skills training on disaster preparedness and response is needed by most of the barangays - Regular conduct of refresher courses for disaster preparedness and response 	MPDC, MGB, MDRRM, BDRRM	Safety and Security	<ul style="list-style-type: none"> - IEC - Strict implementation of zoning guidelines - evacuation centers, presence of list of priorities for evacuation per barangay - emergency response unit - early warning system in place - Institutionalization of skills training enhancement in the barangays 	MDRRMC, MPDC, BDRRMC, NGAS/NGOS, CBDBs

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
				mi and epidemic					
Social	Peace and Order	Current State of Peace and Order	PNP/ Brgy. Official/Tanods	<ul style="list-style-type: none"> - Traffic violations - Illegal drugs and illegal gambling - VAWC/CICL - 	<ul style="list-style-type: none"> - Unlicensed motorist - Illegal gambling and illegal drugs incidents/apprehensions - Theft/Robbery - No. Of VAWC/CICL cases - Anti-trafficking cases - Number of traffic accidents 	DSWD, PNP, CPOC, Barangay Officials & Tanods	Peace and Order	<ul style="list-style-type: none"> - Strict LTO law enforcement - Strict monitoring and intensify campaign of PNP programs - Establishment of barangay/ PNP VAWC desk and capacitated VAWC Officers - IEC - Community radio/plugging - Revitalized/functional CPOC and CADAC 	DSWD, PNP, CPOC,Barangay Officials & Tanods, NGOs
Economic	Income Opportunity of the People	Access to Livelihood and job opportunities	GAD, PESO, DOLE, Cooperatives, Financial institutions, Business establishments, Agriculture and Fisheries,	<ul style="list-style-type: none"> Damage to lives & property; Increased morbidity rate; Degradation/destruction of coastal areas; Damage to Livestock & 	<ul style="list-style-type: none"> Displacement of families; Disruption of the normal functions of family members; Decreased fish catch & other marine resources; Decreased agricultural 		<ul style="list-style-type: none"> Strengthen engineering structures; Strengthen social, economic & environmental support system 	<ul style="list-style-type: none"> - Strengthen Eco-Tourism programs, Marine Biodiversity conservation), MPAs, capacity training to fishermen, outsourcing of funds, advance agricultural technologies adaptive to climate 	GAD, PESO, DOLE, Cooperatives, Financial institutions, Business establishments, Agriculture and Fisheries,

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
			Industries	crop production	productivity			change (cash crop farming), best practices; presence of technical persons	Industries
Environmental	Coastal Areas	Shorefronts with little mangrove cover; Coastal monitoring to be enhanced (MPAs, estuaries, sea grass, corals & coral reefs, sandy beach); illegal extraction of sand & gravel, illegal waste disposal to coastal & other bodies of water; Minimal fund allocation for coastal	BFAR, CENRO, ENRMD, Ofc of the City Agriculturist, DENR, PNP-Maritime Police, Bantay Dagat, Fisherfolks association	- Coastal communities are lukewarm in monitoring & protecting coastal & marine resources; - Limited partnership with the private sector; - Some provisions of local laws are outdated; - CRM plan (2000) not updated; - Coastal erosion - Silted and polluted - Encroachment to easement	- Vegetation along shore fronts and along coast lines are either degraded or nil; - Increasing number of houses and business establishments along coastal areas - Presence of illegal fishing activities -Presence of illegal extraction of sand & gravel;	BFAR, CENRO, ENRMD, Ofc of the City Agriculturist, DENR, PNP-Maritime Police, Bantay Dagat, Fisherfolks association	Mangrove Reforestation; Coastal communities active in coastal area monitoring; Enhance partnership with the private sector, academe & other volunteer groups; Fully implement proper solid & liquid waste management;	Coastal areas reforested; Coastal communities strengthened & active in coastal monitoring; Assessments & feasibility studies to improve coastal & marine resources protection including MPAs enhanced; Enhanced Banilad MPA viewing into an eco-friendly enterprise; Coastal communities engage in good practices in waste management; Increase in fish catch;	BFAR, CENRO, ENRMD, Ofc of the City Agriculturist, DENR, PNP-Maritime Police, Bantay Dagat, Fisherfolks association

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
		management program						- Increase in coral population	
Environmental	Water Security	Marginal slope farming; Illegal diversion of water; Settlement of squaters on river easement; Agricultural wastes released to water bodies; Discharge of waste by inhabitants along river banks; Release of toxic lecheate in ground water (Dumpsite case);	CENRO DENR ENRMD DCWD	No comprehensive River basin management governance strategy; - No clear water governance mechanism;	Soil erosion; Siltation of water bodies/coastal waters; Water bodies are polluted (domestic wastes, phosphates from detergents); Dwindling water supply; Sub standard water quality; Vulnerable aquifers; Forest degradation	CENRO DENR ENRMD	Minimize water body contamination/siltation; Discourage illegal diversion of water; Appropriate agricultural engineering techniques; Encroachment to river banks minimized;	Comprehensive River governance; Massive IEC; strict enforcement of environmental laws; Greening program	CENRO DENR ENRMD

TABLE 6: SUMMARY TABLE FOR ASSESSING VULNERABILITIES

SECTOR	VULNERABILITY								
	EXPOSURE			SENSITIVITY			ADAPTIVE CAPACITY		
	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE	VARIABLE	INDICATOR	SOURCE
		Solid wastes get washed in Banica River during floods;							
Environmental	Agriculture and Fisheries	<p>Reduced area for agriculture due to land conversion;</p> <p>Farmers shift to another form of livelihood;</p> <p>Children opts to major in other fields (not agriculture);</p> <p>Urbanization; population increase</p>	Ofc of the City Agriculturist ; DA, BFAR, Brgys	<p>Malpractices in agriculture and fisheries</p> <p>decreased in food production due to climatic changes</p>	increase fish catch, more harvest, sustainability of agriculture and fisheries	Ofc of the City Agriculturist; DA, BFAR, Brgys	Agriculture and Fisheries	<p>Massive IEC;</p> <p>Strict enforcement and monitoring of practices; application of advancement of technology; and good practices</p> <p>Provide appropriate irrigation system</p> <p>Farm machineries and implements</p> <p>Capacity building to farmers & fishermen</p>	Ofc of the City Agriculturist; DA, BFAR, Brgys

iv. **VULNERABILITY AND CROSS SECTORAL ANALYSIS:**

Flooding in Dumaguete City is very evident, 20 out of 30 barangays are affected, it affects 21% of the total land area of the city with an average height of 1.10 meters flood during heavy down pour or severe rainy seasons. It also affects the 25% of the total population of the 20 barangays covering 4,318 households. See table below for the details and coverage of the flood.

**Table 7: HEV Human and Social Capital for Flood
20 Barangays of Dumaguete City Affected by Flood**

NAME OF BARANGAY		HAZARD		HEIGHT OF FLOOD WATER (M)	Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY FLOOD		TOTAL POPULATION (2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	POSSIBLE AFFECTED POPULATION	POSSIBLE AFFECTED NUMBER OF HOUSEHOLDS	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
1	Bagacay	160.21	5%	1	9,862	1,644	493	82	5%	5%
2	Bajumpandan	241.38	2%	0.5	6,178	1,030	124	21	2%	2%
3	Balugo	131.84	2%	2	3,452	575	69	12	2%	2%
4	Banilad	362.71	60%	1	8,850	1,475	5310	885	60%	60%
5	Bantayan	107.42	10%	0.3	5,042	840	504	84	10%	10%
6	Barangay 1 (Tinago)	8.01	30%	1	2,213	369	1328	221	60%	60%
7	Barangay 2 (Upper Lukewright)	5.24	30%	2	1,336	223	401	67	30%	30%
8	Barangay 8 (Cervantes Extension)	6.23	25%	1	2,214	369	554	138	25%	25%
9	Batinguel	216.91	30%	1	9,333	1,556	2800	467	30%	30%
10	Buñao	44.63	6%	1.5	2,788	465	225	45	8%	8%
11	Cadawinonan	170.28	17%	1.5	5,549	925	943	157	17%	17%
12	Calindagan	84.57	20%	1.5	7,535	1,256	1507	251	20%	20%
13	Camanjac	198.50	20%	1.5	4,397	733	879	147	20%	20%
14	Candau-ay	273.70	60%	2	7,509	1,252	4505	751	60%	60%
15	Junob	225.36	20%	1.5	6,900	1,150	1,380	276	20%	20%

NAME OF BARANGAY		HAZARD			Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY FLOOD	HEIGHT OF FLOOD WATER (M)	TOTAL POPULATION (2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	POSSIBLE AFFECTED POPULATION	POSSIBLE AFFECTED NUMBER OF HOUSEHOLDS	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
16	Looc	61.31	30%	0.5	4,717	786	1415	236	30%	30%
17	Mangnao-Canal	76.36	15%	0.5	3,932	655	590	98	15%	15%
18	Tabuc-tubig	40.68	20%	1	1,704	284	341	57	20%	20%
19	Taclobo	129.31	20%	0.5	9,742	1,624	1948	325	20%	20%
20	Piapi	87.09	5%	0.2	6,053	1,009	303	50	5%	5%
TOTAL		2,544.65	21%	1.10	103,253.00	17,208.83	25,316.13	4,318.98	25%	25%

Dumaguete City is facing Bohol Sea that makes the 30 Barangays vulnerable to strong winds. More than 21 thousand household needs a massive information and will practice typhoon preparedness measures in order for them to be ready for any worst-case scenario. Table 8 shows the extent of preparation need for the City of Dumaguete for any eventualities brought by typhoon.

**Table 8: HEV Human and Social Capital for Typhoon
30 Barangays of Dumaguete City Affected by Typhoon**

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY TYPHOON	TOTAL POPULATION	TOTAL NUMBER OF HOUSEHOLD (2015 NSO)	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLDS	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
1	Bagacay	160.21	100%	9,862	1,644	9,862	1,644	100%	100%
2	Bajumpandan	241.38	100%	6,178	1,030	6,178	1,030	100%	100%
3	Balugo	131.84	100%	3,452	575	3,452	575	100%	100%
4	Banilad	362.71	100%	8,850	1,475	8,850	1,475	100%	100%
5	Bantayan	107.42	100%	5,042	840	5,042	840	100%	100%
6	Barangay 1 (Tinago)	8.01	100%	2,213	369	2,213	369	100%	100%
7	Barangay 2 (Upper Lukewright)	5.24	100%	1,336	223	1,336	223	100%	100%
8	Barangay 3 (Business District)	13.79	100%	195	33	195	33	100%	100%
9	Barangay 4 (Rizal Boulevard)	5.11	100%	135	23	135	23	100%	100%
10	Barangay 5 (Silliman Area)	11.31	100%	109	18	109	18	100%	100%
11	Barangay 6 (Cambagroy)	5.98	100%	236	39	236	39	100%	100%
12	Barangay 7 (Mangga)	5.83	100%	365	61	365	61	100%	100%
13	Barangay 8 (Cervantes Extension)	6.23	100%	2,214	369	2,214	369	100%	100%

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY TYPHOON	TOTAL POPULATION	TOTAL NUMBER OF HOUSEHOLD (2015 NSO)	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLDS	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
14	Batinguel	216.91	100%	9,333	1,556	9,333	1,556	100%	100%
15	Buñao	44.63	100%	2,788	465	2,788	465	100%	100%
16	Cadawinonan	170.28	100%	5,549	925	5,549	925	100%	100%
17	Calindagan	84.57	100%	7,535	1,256	7,535	1,256	100%	100%
18	Camanjac	198.50	100%	4,397	733	4,397	733	100%	100%
19	Candau-ay	273.70	100%	7,509	1,252	7,509	1,252	100%	100%
20	Cantil-e	253.39	100%	4,265	711	4,265	711	100%	100%
21	Daro	130.32	100%	6,580	1,097	6,580	1,097	100%	100%
22	Junob	225.36	100%	6,900	1,150	6,900	1,150	100%	100%
23	Looc	61.31	100%	4,717	786	4,717	786	100%	100%
24	Mangnao-Canal	76.36	100%	3,932	655	3,932	655	100%	100%
25	Motong	57.03	100%	2,260	377	2,260	377	100%	100%
26	Piapi	87.09	100%	6,053	1,009	6,053	1,009	100%	100%
27	Pulantubig	71.10	100%	3,333	556	3,333	556	100%	100%
28	Tabuc-tubig	40.68	100%	1,704	284	1,704	284	100%	100%
29	Taclobo	129.31	100%	9,742	1,624	9,742	1,624	100%	100%
30	Talay	239.91	100%	4,593	766	4,593	766	100%	100%
TOTAL		3,425.51	100%	131,377.00	21,896.17	131,377.00	21,896.17	100%	100%

9 Coastal barangays in Dumaguete City are severely affected by storm surge generated during the occurrences of meteorological related disturbances. In the table below says that during storm surge there are more or less 3,190 populations are always affected that covers 12% of the total land area of 9 barangays are seriously affected.

**Table 9: HEV Human and Social Capital for Storm Surge
9 Barangays of Dumaguete City Affected by Storm Surge**

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY STORM SURGE	TOTAL POPULATION 2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLD	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
1	Banilad	362.71	5%	8,850	1,475	443	74	5%	5%
2	Bantayan	107.42	2%	5,042	840	101	17	2%	2%
3	Barangay 1 (Tinago)	8.01	10%	2,213	369	221	37	10%	10%
4	Barangay 4 (Rizal Boulevard)	5.11	25%	135	23	34	8	25%	25%
5	Barangay 5 (Silliman Area)	11.31	25%	109	18	27	5	25%	25%
6	Calindagan	84.57	5%	7,535	1,256	1130	188	15%	15%
7	Looc	61.31	10%	4,717	786	472	79	10%	10%
8	Mangnao-Canal	76.36		3,932	655	157	26	4%	4%
9	Piapi	87.09	10%	6,053	1,009	605	61	10%	10%
TOTAL		803.89	12%	38,586.00	6,431.00	3,190.17	494.15	8%	8%

Although tsunami is a very rare events, the Dumaguete City projected that 12% of the total land areas of 9 coastal barangays in Dumaguete will be submerge to tsunami. And they forecasted that 13% of the population in the mentioned 9 barangays in table below will be affected by tsunami.

**Table 10: HEV Human and Social Capital for Tsunami
9 Barangays of Dumaguete City Affected by Tsunami**

NAME OF BARANGAY	HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
	LAND AREA (HA)	% OF AREA AFFECTED BY STORM SURGE	TOTAL POPULATION 2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLD	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
1 Banilad	362.71	5%	8,850	1,475	885	148	10%	10%
2 Bantayan	107.42	2%	5,042	840	252	42	5%	5%
3 Barangay 1 (Tinago)	8.01	10%	2,213	369	266	74	20%	20%
4 Barangay 4 (Rizal Boulevard)	5.11	25%	135	23	34	8	30%	30%
5 Barangay 5 (Silliman Area)	11.31	25%	109	18	33	5	30%	30%
6 Calindagan	84.57	5%	7,535	1,256	1130	188	15%	15%
7 Looc	61.31	10%	4,717	786	943	157	20%	20%
8 Mangnao-Canal	76.36		3,932	655	393	66	10%	10%
9 Piapi	87.09	10%	6,053	1,009	1211	242	20%	20%
TOTAL	803.89	12%	38,586.00	6,431.00	5,146.56	930.43	13%	14%

For ground rapture, the 30 Barangays where identified as vulnerable considering that in 2010 the island was hit by magnitude 6.9 quake. The Table below shows that the barangays shaded with red are consider the most vulnerable and prone to ground shaking

**Table 11: HEV Human and Social Capital for Ground Shaking
30 Barangays of Dumaguete City Affected by Ground Shaking**

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY GROUND SHAKING	TOTAL POPULATION (2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLD	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
1	Bagacay	160.21	100%	9,862	1,644	9,862	1,644	100%	100%
2	Bajumpandan	241.38	100%	6,178	1,030	6,178	1,030	100%	100%
3	Balugo	131.84	100%	3,452	575	3,452	575	100%	100%
4	Banilad	362.71	100%	8,850	1,475	8,850	1,475	100%	100%
5	Bantayan	107.42	100%	5,042	840	5,042	840	100%	100%
6	Barangay 1 (Tinago)	8.01	100%	2,213	369	2,213	369	100%	100%
7	Barangay 2 (Upper Lukewright)	5.24	100%	1,336	223	1,336	223	100%	100%
8	Barangay 3 (Business District)	13.79	100%	195	33	195	33	100%	100%
9	Barangay 4 (Rizal Boulevard)	5.11	100%	135	23	135	23	100%	100%
10	Barangay 5 (Silliman Area)	11.31	100%	109	18	109	18	100%	100%
11	Barangay 6 (Cambagroy)	5.98	100%	236	39	236	39	100%	100%
12	Barangay 7 (Mangga)	5.83	100%	365	61	365	61	100%	100%
13	Barangay 8 (Cervantes Extension)	6.23	100%	2,214	369	2,214	369	100%	100%
14	Batinguel	216.91	100%	9,333	1,556	9,333	1,556	100%	100%
15	Buñao	44.63	100%	2,788	465	2,788	465	100%	100%
16	Cadawinonan	170.28	100%	5,549	925	5,549	925	100%	100%
17	Calindagan	84.57	100%	7,535	1,256	7,535	1,256	100%	100%
18	Camanjac	198.50	100%	4,397	733	4,397	733	100%	100%
19	Candau-ay	273.70	100%	7,509	1,252	7,509	1,252	100%	100%
20	Cantil-e	253.39	100%	4,265	711	4,265	711	100%	100%
21	Daro	130.32	100%	6,580	1,097	6,580	1,097	100%	100%
22	Junob	225.36	100%	6,900	1,150	6,900	1,150	100%	100%
23	Looc	61.31	100%	4,717	786	4,717	786	100%	100%
24	Mangnao-Canal	76.36	100%	3,932	655	3,932	655	100%	100%

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY GROUND SHAKING	TOTAL POPULATION (2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLD	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
25	Motong	57.03	100%	2,260	377	2,260	377	100%	100%
26	Piapi	87.09	100%	6,053	1,009	6,053	1,009	100%	100%
27	Pulantubig	71.10	100%	3,333	556	3,333	556	100%	100%
28	Tabuc-tubig	40.68	100%	1,704	284	1,704	284	100%	100%
29	Taclobo	129.31	100%	9,742	1,624	9,742	1,624	100%	100%
30	Talay	239.91	100%	4,593	766	4,593	766	100%	100%
TOTAL		3,425.51	100%	131,377.00	21,896.17	131,377.00	21,896.17	100%	100%

The Local Disaster Risk Reduction and Management Council (LDRRMC) of Dumaguete City agreed that all the 30 barangays are prone to fire due to rapid urbanization of the city even on its sub-urban areas. However, the barangays on the table below having an orange shade are consider highly fire prone areas, with above 30% rating in terms of social and human vulnerability.

**Table 12: HEV Human and Social Capital for Fire Incidence
30 Barangays of Dumaguete City Affected by Fire Incidence**

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY FIRE	TOTAL POPULATION (2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLD	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
1	Bagacay	160.21		9,862	1,644	1,775	300	18%	18%
2	Bajumpandan	241.38		6,178	1,030	1792	300	29%	29%
3	Balugo	131.84		3,452	575	1208	200	35%	35%
4	Banilad	362.71		8,850	1,475	1239	200	14%	14%
5	Bantayan	107.42		5,042	840	605	100	12%	12%
6	Barangay 1 (Tinago)	8.01		2,213	369	1881	313	85%	85%
7	Barangay 2 (Upper Lukewright)	5.24		1,336	223	681.36	114	51%	51%
8	Barangay 3 (Business District)	13.79		195	33	59	10	30%	30%
9	Barangay 4 (Rizal Boulevard)	5.11		135	23	58	10	43%	43%
10	Barangay 5 (Silliman Area)	11.31		109	18	31	5	28%	28%
11	Barangay 6 (Cambagroy)	5.98		236	39	61	10	26%	26%
12	Barangay 7 (Mangga)	5.83		365	61	10	10	16%	16%
13	Barangay 8 (Cervantes Extension)	6.23		2,214	369	908	150	41%	41%
14	Batinguel	216.91		9,333	1,556	933	150	10%	10%
15	Buñao	44.63		2,788	465	167	30	6%	6%
16	Cadawinonan	170.28		5,549	925	888	150	16%	16%
17	Calindagan	84.57		7,535	1,256	4220	700	56%	56%
18	Camanjac	198.50		4,397	733	308	50	7%	7%
19	Candau-ay	273.70		7,509	1,252	1802	300	24%	24%
20	Cantil-e	253.39		4,265	711	896	150	21%	21%
21	Daro	130.32		6,580	1,097	3,619	600	55%	55%
22	Junob	225.36		6,900	1,150	483	70	7%	7%
23	Looc	61.31		4,717	786	3019	500	64%	64%

NAME OF BARANGAY		HAZARD		Social/ Human EXPOSURE		Social/ Human VULNERABILITIES			
		LAND AREA (HA)	% OF AREA AFFECTED BY FIRE	TOTAL POPULATION (2015 NSO)	TOTAL NUMBER OF HOUSEHOLD	AFFECTED POPULATION	AFFECTED NUMBER OF HOUSEHOLD	% AFFECTED POPULATION	% AFFECTED NUMBER OF HOUSEHOLD
24	Mangnao-Canal	76.36		3,932	655	315	50	8%	8%
25	Motong	57.03		2,260	377	181	30	8%	8%
26	Piapi	87.09		6,053	1,009	3027	500	50%	50%
27	Pulantubig	71.10		3,333	556	1800	300	54%	54%
28	Tabuc-tubig	40.68		1,704	284	596	100	35%	35%
29	Taclobo	129.31		9,742	1,624	3020	500	31%	31%
30	Talay	239.91		4,593	766	138	20	3%	3%
TOTAL		3,425.51		131,377.00	21,896.17	35,717.72	5,922.00	27%	27%

Exposure to Natural Hazard:

Barangay exposed to natural hazards are very essential in this vulnerability and cross sectoral analysis in order for the LGU to prioritize in terms of development, CCA and DRR assistance among the 30 Barangays of Dumaguete City. In this particular analysis, the LCCAP-DRRM Council identify 5 natural hazards and 1 human induced-hazard exist in the Dumaguete and based on the assessment 3 barangays were identify as frequently visited this natural and human-induced hazards or highly exposed compare to other barangays.

Table 13: BARANGAY EXPOSED TO NATURAL AND HUMAN INDUCED HAZARD									
NAME OF BARANGAYS		FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	EPIDEMIC	FIRE	TOTAL	RANK
1	Bagacay	√	√		√	Dengue/ Leptospirosis/ Acute Gastroenteritis	√	5	2nd
2	Bajumpandan	√	√		√	Dengue	√	5	2nd
3	Balugo	√	√		√		√	4	3rd
4	Banilad	√	√	√	√	Dengue/ Leptospirosis		5	2nd
5	Bantayan	√	√	√	√	Dengue		5	2nd
6	Barangay 1 (Tinago)	√	√	√	√	Dengue/ Leptospirosis	√	6	1st
7	Barangay 2 (Upper Lukewright)	√	√		√		√	4	3rd
8	Barangay 3 (Business District)		√		√		√	3	4th
9	Barangay 4 (Rizal Boulevard)		√	√	√		√	4	3rd
10	Barangay 5 (Silliman Area)		√	√	√	Dengue	√	5	2nd
11	Barangay 6 (Cambagroy)		√		√		√	3	4th
12	Barangay 7 (Mangga)		√		√		√	3	4th
13	Barangay 8 (Cervantes Extension)	√	√		√	Dengue/ Leptospirosis	√	5	2nd
14	Batinguel	√	√		√	Dengue	√	5	2nd
15	Buñao	√	√		√	Dengue	√	5	2nd
16	Cadawinonan	√	√		√	Dengue	√	5	2nd
17	Calindagan	√	√	√	√	Dengue	√	6	1st
18	Camanjac	√	√		√	Dengue		4	3rd
19	Candau-ay	√	√		√	Dengue/ Leptospirosis/ Chikungunya	√	5	2nd
20	Cantil-e		√		√	Dengue/ Chikungunya		3	4th
21	Daro		√		√	Dengue	√	4	3rd
22	Junob	√	√		√	Dengue		4	3rd

Table 13: BARANGAY EXPOSED TO NATURAL AND HUMAN INDUCED HAZARD

NAME OF BARANGAYS		FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	EPIDEMIC	FIRE	TOTAL	RANK
23	Looc	√	√	√	√	Dengue/ Leptospirosis	√	6	1st
24	Mangnao-Canal	√	√	√	√	Dengue		5	2nd
25	Motong		√		√	Dengue		4	3rd
26	Piapi	√	√	√	√	Dengue		5	2nd
27	Pulantubig		√		√	Dengue		3	4th
28	Tabuc-tubig	√	√		√	Dengue	√	5	2nd
29	Taclobo	√	√		√	Dengue/ Leptospirosis	√	5	2nd
30	Talay		√		√	Dengue		4	3rd

Household Based hazard Specific Evacuation Center:

Household based hazard specific evacuation centers was considered as important information in CDRA to identify gaps in terms of available evacuation centers in the Dumaguete City. And it is important to note that it should be hazard specific to consider the lesson of super typhoon Haiyan that people evacuated in an evacuation center that they think that that are sturdy and withstand strong winds from typhoon, but unfortunately it was not safe for storm surge that cause the tremendous casualties in Tacloban City.

TABLE 14: HOUSEHOLD BASED HAZARD SPECIFIC EVACUATION CENTER													
	Name of Barangays	Total Number of Household	Total Number of Vulnerable Households to Specific Hazards					Hazard Specific Evacuation Center					GAPS/NEEDS
			FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	
1	Bagacay	1,644	100	500	0	1,644	300	DCC=6/BH=5/ MPH=84/ BHC=5	MPH= 500	n/a	open space	MPH=300	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
2	Bajumpan dan	1,030	0	1030	0	1,030	500	0	MPH= 500; DCCs= 12; BHC=5	n/a	open space	MPH=500	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
3	Balugo	575	10	745	0	575	270	Balugo E/S=10	Balugo E/S=430;M PH=315		Balugo Mini Park	Balugo E/S=270	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
4	Banilad	1,475	190	190	30	1,475	500	Chapels= 170; BH=20	Chapels= 170; BH=20	Chapels=30	open space	Chapels= 170; BH=20; Schools= 310	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
5	Bantayan	840	24	244	220	840		St. Catherine Bldg.=24	BH=10; MPH=60; Casa Esperanza= 5	BH=10; MPH=60; Casa Esperanza= 5	open space		Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
6	Barangay 1 (Tinago)	369	54	164	110	369	312	MPH=54	MPH= 110	City Central E/S=110	open space	City Central E/S=110;	Insufficient numbers of comfort and bath rooms; no permanent

TABLE 14: HOUSEHOLD BASED HAZARD SPECIFIC EVACUATION CENTER													
	Name of Barangays	Total Number of Household	Total Number of Vulnerable Households to Specific Hazards					Hazard Specific Evacuation Center					GAPS/NEEDS
			FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	
												MPH=110; DCC=6	standard community kitchen
7	Barangay 2 (Upper Lukewright)	223	150	150	0	223	114	PMC Bldg 2=150	PMC Bldg 2=150	n/a	open space	PMC Bldg 2=150	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
8	Barangay 3 (Business District)	33	0	0	0	33	10	n/a	n/a	n/a	open space	MPH=10	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
9	Barangay 4 (Rizal Boulevard)	23	0	0	0	23	10	n/a	n/a	n/a	open space	MPH=10	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
10	Barangay 5 (Silliman Area)	18	0	0	0	18	5	n/a	n/a	n/a	open space	no identified evacuation center	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
11	Barangay 6 (Cambagroy)	39	0	0	0	39	10	n/a	n/a	n/a	open space	no identified evacuation center	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
12	Barangay 7 (Mangga)	61	0	0	0	61	10	n/a	n/a	n/a	open space	West City E/S=10	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
13	Barangay 8 (Cervantes Extension)	369	32	32	0	369	150	COSCA Gym =32	COSCA Gym =32	n/a	open space	COSCA Gym=150	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen

TABLE 14: HOUSEHOLD BASED HAZARD SPECIFIC EVACUATION CENTER

	Name of Barangays	Total Number of Household	Total Number of Vulnerable Households to Specific Hazards					Hazard Specific Evacuation Center					GAPS/NEEDS
			FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	
14	Batinguel	1,556	265	265	0	1,556	200	Batinguel E/S=165; MPH=100	Batinguel E/S=165; MPH=100	n/a	open space	Batinguel E/S=100; MPH=100	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
15	Buñao	465	130	130	0	465	30	Montessori School=50; Magsaysay E/S=50; Chape1=10; DCC=10	Montessori School=50; Magsaysay E/S=50; Chape1=10; DCC=10	n/a	open space	Montessori School=30	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
16	Cadawinonan	925	86	86	0	925	200	MPH=20; Cadawinonan E/S=66	MPH=20; Cadawinonan E/S=66	n/a	open space	MPH=20; Cadawinonan E/S=180	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
17	Calindagan	1,256	60	460	400	1,256	700	City H/S=60	City H/S=460	City H/S=400	open space	City H/S=700	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
18	Camanjac	733	72	72	0	733	50	Schools=72	Schools=72	n/a	open space	Schools=50	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
19	Candau-ay	1,252	276	276	0	1,252	300	Churches=20; Schools=256;	Churches=20; Schools=256;	n/a	open space	Churches=20; Schools=280;	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
20	Cantil-e	711	27	27	0	711	150	School=27	School=27	n/a	open space	School=140; BHC=5; BH=5	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen

TABLE 14: HOUSEHOLD BASED HAZARD SPECIFIC EVACUATION CENTER

	Name of Barangays	Total Number of Household	Total Number of Vulnerable Households to Specific Hazards					Hazard Specific Evacuation Center					GAPS/NEEDS
			FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	
21	Daro	1,097	30	30	0	1,097	600	MPH=30	MPH= 30	n/a	open space	Schools= 570; MPH=30	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
22	Junob	1,150	250	250	0	1,150	70	MPH=50; Schools= 200	MPH= 50; Schools= 200	n/s	open space	Schools= 70	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
23	Looc	786	0	141	141	786	500	n/a	Macias sports Complex=141	Macias sports Complex=141	open space	Macias sports Complex = 500	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
24	Mangnao-Canal	655	20	70	50	655	50	South City E/S=20	MPH=70	MPH=50	open space	MPH=50	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
25	Motong	377	20	20	0	377	30	MPH=20	MPH=20	n/a	open space	MPH/Chapel=30	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
26	Piapi	1,009	0	25	25	1,009	500	n/a	Schools=25	Schools=25	open space	MPH/Schools=500	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
27	Pulantubig	556	14	14	0	556	300	MPH=14	MPH=14	n/a	open space	MPH/Schools=300	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen

TABLE 14: HOUSEHOLD BASED HAZARD SPECIFIC EVACUATION CENTER													
	Name of Barangays	Total Number of Household	Total Number of Vulnerable Households to Specific Hazards					Hazard Specific Evacuation Center					GAPS/NEEDS
			FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	FLOOD	TYPHOON	STORM SURGE	GROUND SHAKING	FIRE	
28	Tabuc-tubig	284	30	30	0	284	100	Chapels= 15; DCCs=10; MPH=5	Chapels= 15; DCCs=10; MPH=5	n/a	open space	Chapels= 15; DCCs=10; MPH=5	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
29	Taclobo	1,624	95	95	0	1,624	500	FU/NORSU/ Schools= 95	FU/NORSU/ Schools= 95	n/a	open space	FU/NORSU/Schools= 500	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
30	Talay	766	0	0	0	766	20	n/a	n/a	n/a	open space	MPH=20	Insufficient numbers of comfort and bath rooms; no permanent standard community kitchen
		21,896											

Exposure to Climatic Variability:

In the table below, shows the exposures of vulnerable sectors to certain climatic variability scenarios. This is a very good information for the LGUs in formulating and effective and efficient climate change adaptation and mitigation plan that will benefit to human and social capital of the city.

NAME OF BARANGAYS		Table: 15: Exposure to Climatic Variability																				
		CLIMATE HAZARD																				
		Increasing Temperature						Stronger winds compared to the past years					Strong Typhoons					More rains Compared to the past				
		TOTAL	male	Female	PWD	Elderly	0-6	Male	Female	PWD	Elderly	Children	Male	Female	PWD	Elderly	Children	Male	Female	PWD	Elderly	Children
1	Bagacay	9862	4970	4892	158	723	1125	994	978	32	145	225	994	978	32	145	225	994	196	6	29	45
2	Bajumpandan	6178	3114	3064	99	498	629	623	613	20	100	126	623	613	20	100	126	125	123	4	20	25
3	Balugo	3452	1740	1712	55	291	411	348	342	11	58	82	348	342	11	58	82	70	68	2	12	16
4	Banilad	8850	4460	4390	142	882	1217	892	878	28	176	243	892	878	28	176	243	178	176	6	35	49
5	Bantayan	5042	2541	2501	81	776	400	508	500	16	155	80	508	500	16	155	80	102	100	3	31	16
6	Barangay 1 (Tinago)	2213	1115	1098	35	380	287	223	220	7	76	57	223	220	7	76	57	45	44	1	15	11
7	Barangay 2 (Upper Lukewright)	1336	673	663	21	295	115	135	133	4	59	23	135	133	4	59	23	27	27	1	12	5
8	Barangay 3 (Business District)	195	98	97	3	150	11	20	19	1	30	2	20	19	1	30	2	4	4	0	6	0
9	Barangay 4 (Rizal Boulevard)	135	68	67	2	83	15	14	13	0	17	3	14	13	0	17	3	3	3	0	3	1
10	Barangay 5 (Silliman Area)	109	55	54	2	78	11	11	11	0	16	2	11	11	0	16	2	2	2	0	3	0
11	Barangay 6 (Cambagroy)	236	119	117	4	117	22	24	23	1	23	4	24	23	1	23	4	5	5	0	5	1
12	Barangay 7	365	184	181	6	126	50	37	36	1	25	10	37	36	1	25	10	7	7	0	5	2

NAME OF BARANGAYS		Table: 15: Exposure to Climatic Variability																				
		CLIMATE HAZARD																				
		Increasing Temperature					Stronger winds compared to the past years					Strong Typhoons					More rains Compared to the past					
		TOTAL	male	Female	PWD	Elderly	0-6	Male	Female	PWD	Elderly	Children	Male	Female	PWD	Elderly	Children	Male	Female	PWD	Elderly	Children
	(Mangga)																					
13	Barangay 8 (Cervantes Extension)	2214	1116	1098	35	297	321	223	220	7	59	64	223	220	7	59	64	45	44	1	12	13
14	Batinguel	9333	4704	4629	149	907	1113	941	926	30	181	223	941	926	30	181	223	188	185	6	36	45
15	Buñao	2788	1405	1383	45	364	311	281	277	9	73	62	281	277	9	73	62	56	55	2	15	12
16	Cadawinonan	5549	2797	2752	89	422	850	559	550	18	84	170	559	550	18	84	170	112	110	4	17	34
17	Calindagan	7535	3798	3737	121	807	856	760	747	24	161	171	760	747	24	161	171	152	149	5	32	34
18	Camanjac	4397	2216	2181	70	427	558	443	436	14	85	112	443	436	14	85	112	89	87	3	17	22
19	Candau-ay	7509	3785	3724	120	537	947	757	745	24	107	189	757	745	24	107	189	151	149	5	21	38
20	Cantil-e	4265	2150	2115	68	269	450	430	423	14	54	90	430	423	14	54	90	86	85	3	11	18
21	Daro	6580	3316	3264	105	1173	907	663	653	21	235	181	663	653	21	235	181	133	131	4	47	36
22	Junob	6900	3478	3422	110	629	765	696	684	22	126	153	696	684	22	126	153	139	137	4	25	31
23	Looc	4717	2377	2340	75	583	506	475	468	15	117	101	475	468	15	117	101	95	94	3	23	20
24	Mangnao-Canal	3932	1982	1950	63	469	548	396	390	13	94	110	396	390	13	94	110	79	78	3	19	22
25	Motong	2260	1139	1121	36	280	375	228	224	7	56	75	228	224	7	56	75	46	45	1	11	15
26	Piapi	6053	3051	3002	97	1136	671	610	600	19	227	134	610	600	19	227	134	122	120	4	45	27
27	Pulantubig	3333	1680	1653	53	493	370	336	331	11	99	74	336	331	11	99	74	67	66	2	20	15
28	Tabuc-tubig	1704	859	845	27	309	234	172	169	5	62	47	172	169	5	62	47	34	34	1	12	9
29	Taclobo	9742	4910	4832	156	1580	1107	982	966	31	316	221	982	966	31	316	221	196	193	6	63	44
30	Talay	4593	2315	2278	73	518	509	463	456	15	104	102	463	456	15	104	102	93	91	3	21	20
TOTAL		131,377.00	66214	65163	2102	15599	15691	13243	13033	420	3120	3138	13243	13033	420	3120		2649	2607	84	624	628

NAME OF BARANGAYS		CLIMATE HAZARDS										TOTAL
		More Floods					More frequent Flooding due to rainfall					
		Male	Female	PWD	Elderly	Children	Male	Female	PWD	Elderly	Children	
1	Bagacay	1,491.13	1,467.47	47.34	216.90	337.50	1,491.13	1,467.47	9.47	43.38	337.50	6,909.29
2	Bajumpandan	622.74	622.74	19.77	99.60	99.60	934.11	919.29	5.93	29.88	188.70	3,542.37
3	Balugo	347.96	347.96	11.05	58.20	58.20	521.94	513.66	3.31	17.46	123.30	2,003.04
4	Banilad	1,338.12	1,316.88	42.48	264.60	365.10	1,338.12	1,316.88	8.50	52.92	365.10	6,408.70
5	Bantayan	762.35	750.25	24.20	232.80	120.00	762.35	750.25	4.84	46.56	120.00	3,573.60
6	Barangay 1 (Tinago)	334.61	329.29	10.62	114.00	86.10	334.61	329.29	2.12	22.80	86.10	1,649.55
7	Barangay 2 (Upper Lukewright)	202.00	198.80	6.41	88.50	34.50	202.00	198.80	1.28	17.70	34.50	984.50
8	Barangay 3 (Business District)	9.83	29.02	0.94	45.00	3.30	29.48	29.02	0.19	9.00	3.30	159.07
9	Barangay 4 (Rizal Boulevard)	10.21	10.04	0.32	12.45	2.25	20.41	20.09	0.13	4.98	4.50	85.38
10	Barangay 5 (Silliman Area)	5.49	5.41	0.17	7.80	1.10	16.48	16.22	0.10	4.68	3.30	60.76
11	Barangay 6 (Cambagroy)	23.79	23.41	0.76	23.40	4.40	35.68	35.12	0.23	7.02	6.60	160.40
12	Barangay 7 (Mangga)	18.40	18.10	0.58	12.60	5.00	55.19	54.31	0.35	7.56	15.00	187.09
13	Barangay 8 (Cervantes Extension)	334.76	329.44	10.63	89.10	96.30	334.76	329.44	2.13	17.82	96.30	1,640.67
14	Batinguel	1,411.15	1,388.75	44.80	272.10	333.90	1,411.15	1,388.75	8.96	54.42	333.90	6,647.88
15	Buñao	421.55	414.85	13.38	109.20	93.30	421.55	414.85	2.68	21.84	93.30	2,006.50
16	Cadawinonan	839.01	825.69	26.64	126.60	255.00	839.01	825.69	5.33	25.32	255.00	4,023.28
17	Calindagan	1,139.29	1,121.21	36.17	242.10	256.80	1,139.29	1,121.21	7.23	48.42	256.80	5,368.52
18	Camanjac	664.83	654.27	21.11	128.10	167.40	664.83	654.27	4.22	25.62	167.40	3,152.05
19	Candau-ay	1,135.36	1,117.34	36.04	161.10	284.10	1,135.36	1,117.34	7.21	32.22	284.10	5,310.17
20	Cantil-e	322.43	317.32	10.24	40.35	67.50	644.87	634.63	4.09	16.14	135.00	2,192.57
21	Daro	497.45	489.55	15.79	175.95	136.05	994.90	979.10	6.32	70.38	272.10	3,637.59
22	Junob	1,043.28	1,026.72	33.12	188.70	229.50	1,043.28	1,026.72	6.62	37.74	229.50	4,865.18
23	Looc	594.34	584.91	18.87	145.75	126.50	713.21	701.89	4.53	34.98	151.80	3,076.78
24	Mangnao-Canal	594.52	585.08	18.87	140.70	164.40	594.52	585.08	3.77	28.14	164.40	2,879.49
25	Motong	113.90	112.10	3.62	28.00	37.50	341.71	336.29	2.17	16.80	112.50	1,104.59
26	Piapi	305.07	300.23	9.68	113.60	67.10	915.21	900.69	5.81	68.16	201.30	2,886.86
27	Pulantubig	251.97	247.98	8.00	73.95	55.50	503.95	495.95	3.20	29.58	111.00	1,781.08

NAME OF BARANGAYS		CLIMATE HAZARDS										
		More Floods					More frequent Flooding due to rainfall					TOTAL
		Male	Female	PWD	Elderly	Children	Male	Female	PWD	Elderly	Children	
28	Tabuc-tubig	257.64	253.56	8.18	92.70	70.20	257.64	253.56	1.64	18.54	70.20	1,283.86
29	Taclobo	1,472.99	1,449.61	46.76	474.00	332.10	1,472.99	1,449.61	9.35	94.80	332.10	7,134.31
30	Talay	231.49	227.81	7.35	51.80	50.90	694.46	683.44	4.41	31.08	152.70	2,135.44
TOTAL		16,797.66	16,565.79	533.88	3,829.65	3,941.10	19,864.20	19,548.90	126.12	935.94	4,707.30	86850.54712

DISASTER RISK MAPS OF DUMAGUETE CITY:

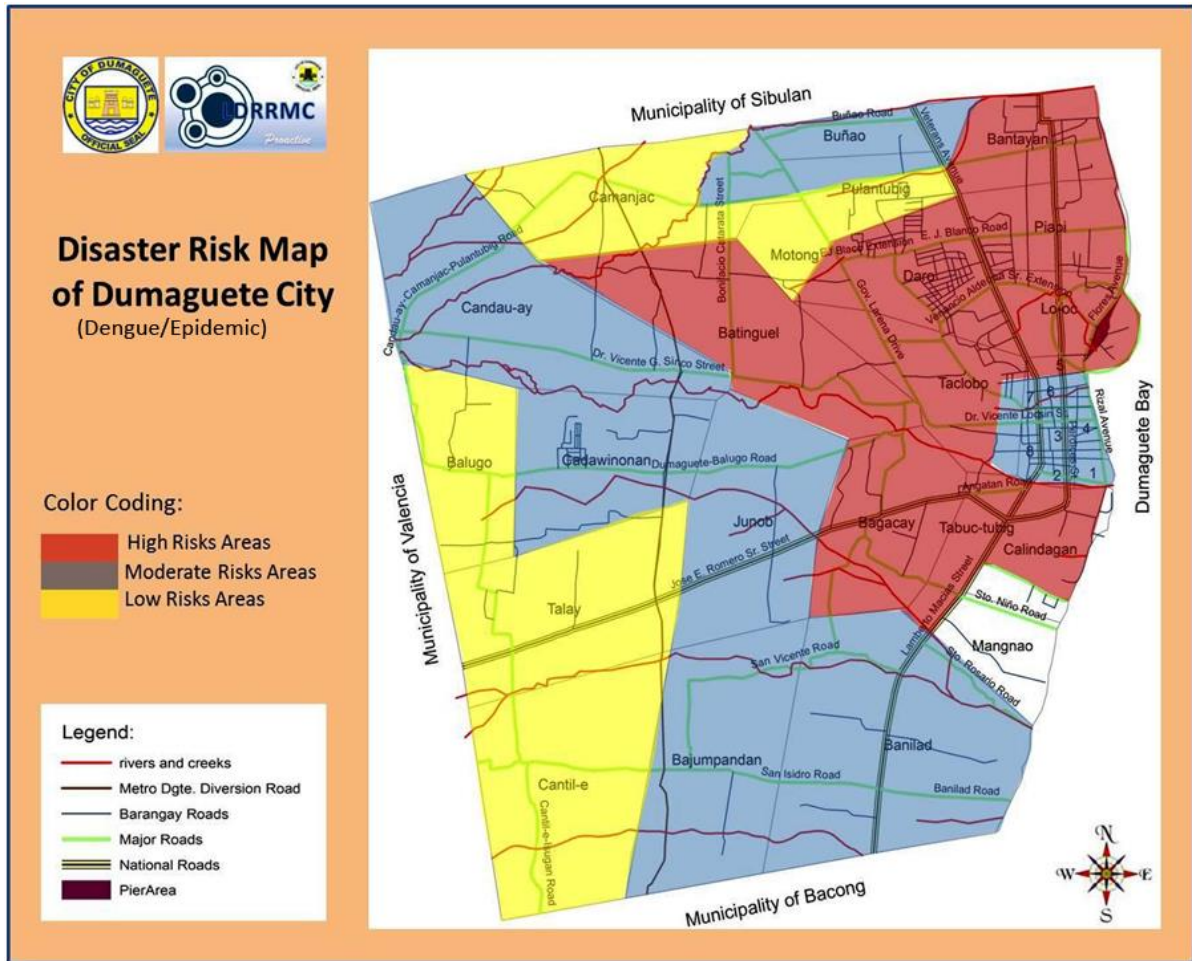
The maps below are not digitized and as such are based only on the estimates of locations by the LDRRMC/Office according to their experience and disaster historical timeline of the city. In the maps they have color-coded the degree of risk of certain hazards: **RED** for **High Risk** if **more than 50%** of the population, infrastructures, agricultural and critical lifelines are at stake, **BLUE** for **Moderate Risk** if **30-50%** of the mentioned assets are at stake, and **YELLOW** for **Low Risk** hazard if **less than 30%** are exposed..

Figure 12: Flood Risk Map of Dumaguete City



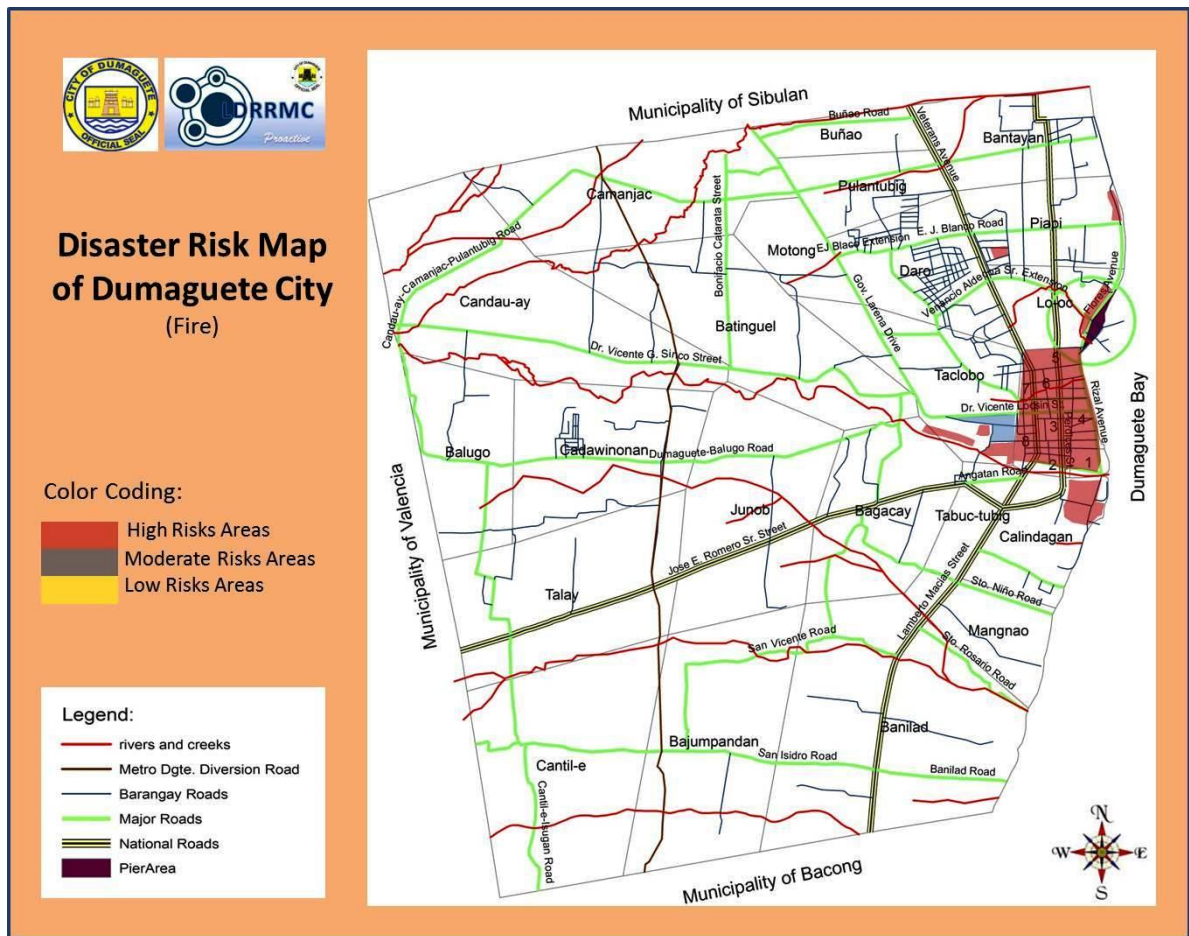
Risk to flooding is considered high in Dumaguete because the whole city is a natural flood plain of the Okoy and Banica River watersheds, where its headwaters come from the high mountains of Valencia (1,200m AMSL). Out of 30 Barangays, 21 were severely affected by floods based on the latest major occurrence of December 2011 when TS SENDONG hit Dumaguete City.

Figure 13: Dengue/Epidemic Risk Map of Dumaguete City



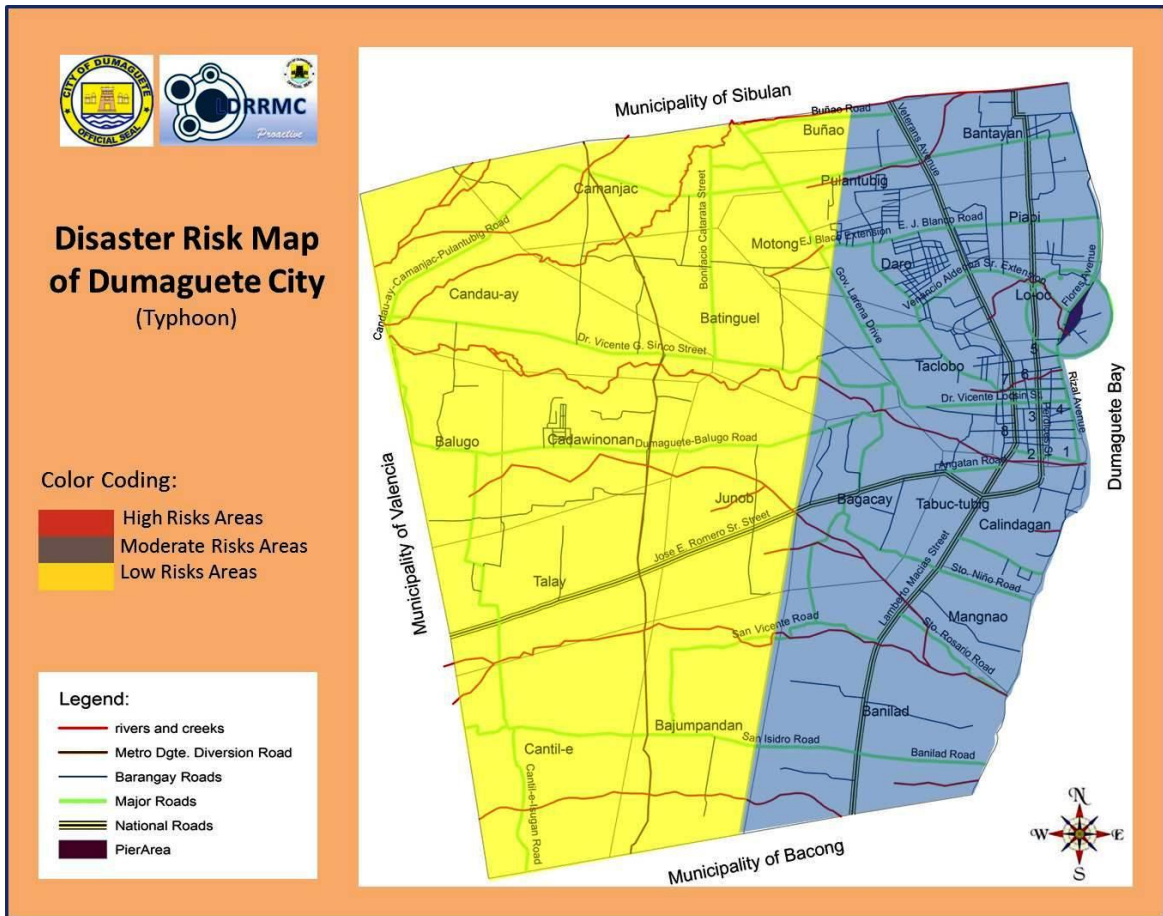
The City Health Office (CHO) of Dumaguete City considers the Dengue virus as endemic in the city. Although the presence of the virus has been felt year round in all the barangays it is quite significant in the following 9 barangays: Calindagan, Tabuc-tubig, Bagacay, Taclobo, Batinguel, Daro, Looc, Piapi and Bantayan.

Figure 14: Fire Risk Map of Dumaguete City



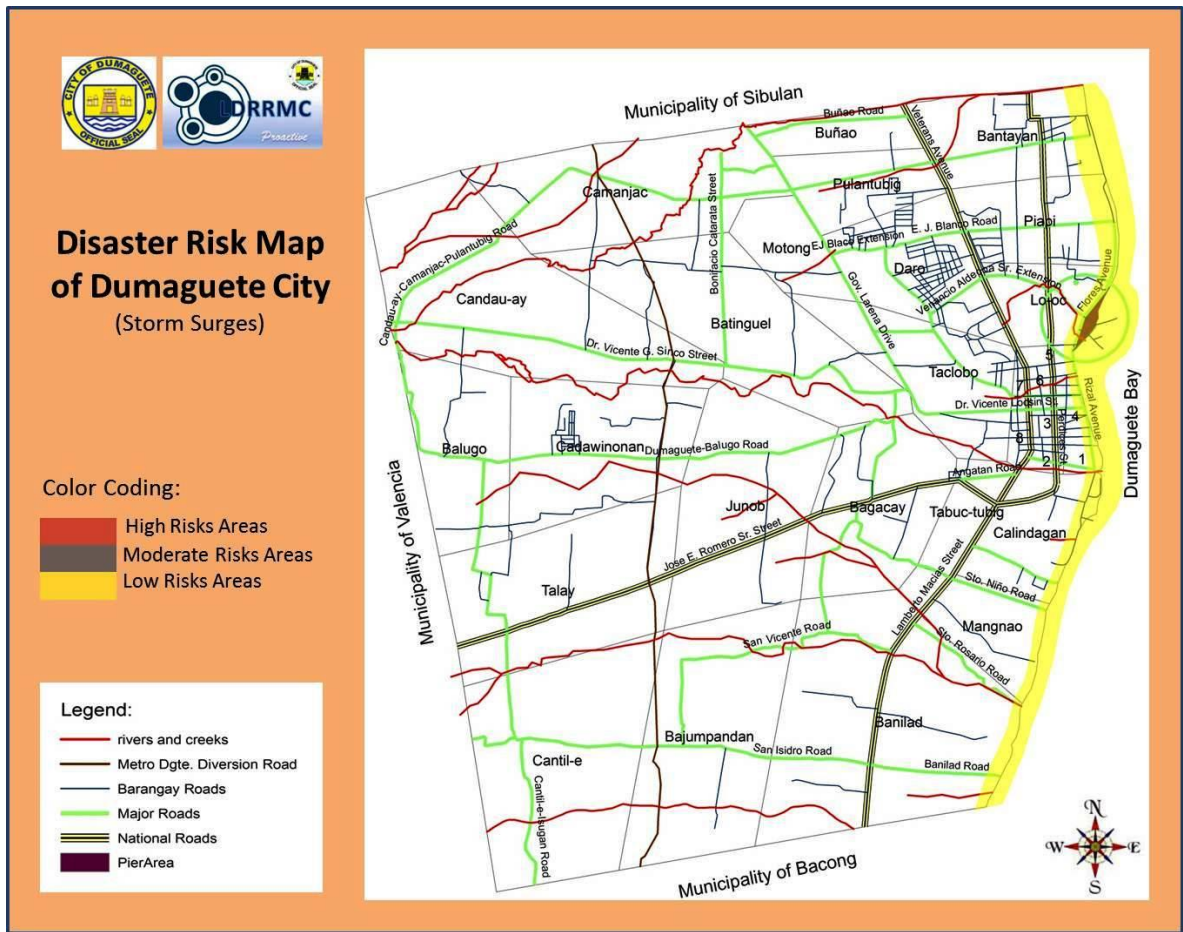
During the LCCAP-DRRM Planning and Budgeting Workshop, the representative from the Bureau of Fire Protection (BFP) identified Brgy Poblacions 1 to 8 as High Risk to fire because it is the commercial center of the City and the dwelling place of most number of informal settlers in the City. Portions of Barangays Calindagan, Taclobo, Looc, Daro and Piapi are also considered High Risk because of the presence of a number of light material houses near the Talipapa.

Figure 15: Typhoon Risk Map of Dumaguete City



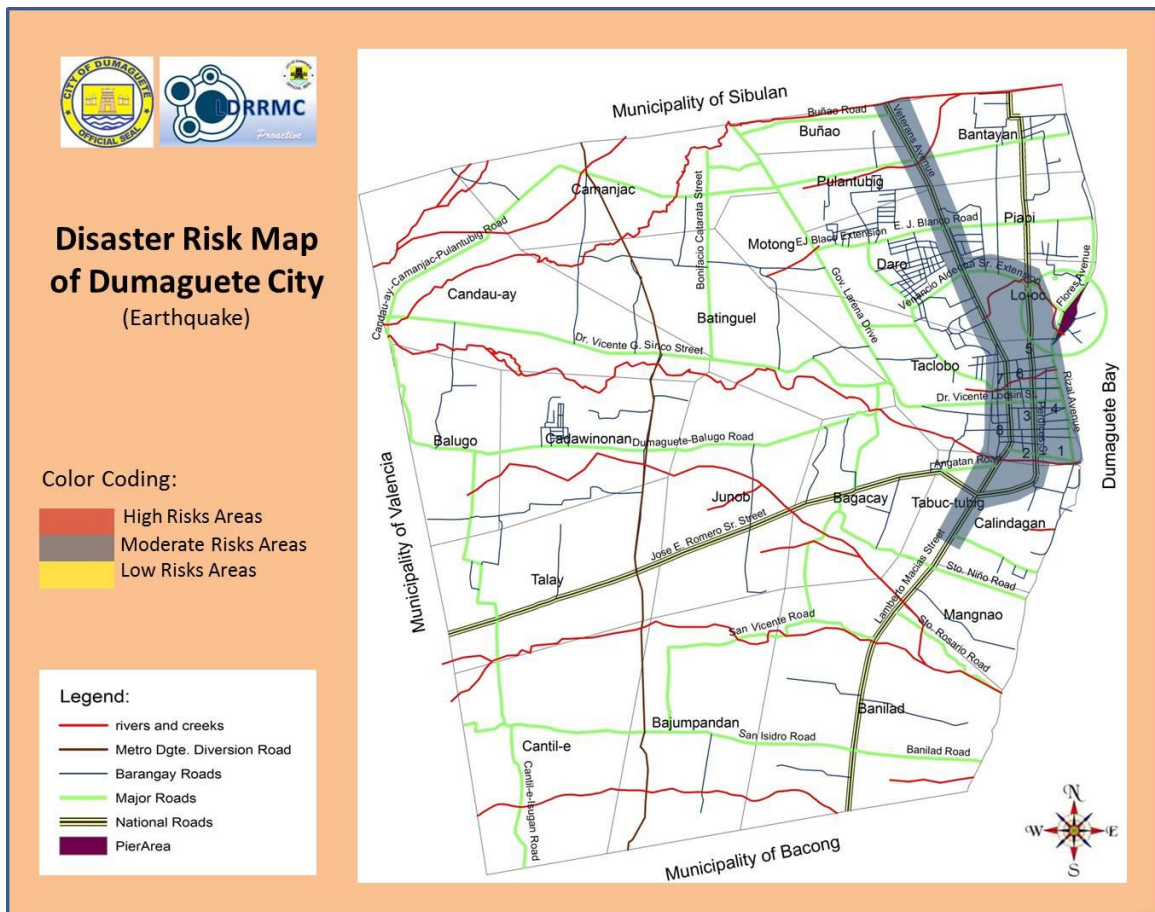
Although Dumaguete City has been hit by typhoons for the past 3 years, the LDRRMC agreed that it is only considered as a Medium to Low risk hazard. Occurrences of strong winds due to these Typhoons did not do much damage to the houses in the city because of its minimal number of light material houses near the shoreline. But all participants agreed that flooding as secondary hazards of typhoons is considered high risks in Dumaguete City.

Figure 16: Storm Surge Risk Map of Dumaguete City



As mentioned above, houses made of light materials are very minimal along the coastal areas of Dumaguete City. In addition infrastructure projects for shoreline protection have not been overlooked by the city along the coastline particularly on those areas having a concentration of coastal population. This is why storm surges are considered as a Low Risk hazard by the LDRRMC.

Figure 17: Earthquake Risk Map of Dumaguete City



Although a major earthquake struck the northern part of the province on February 2012, the LDRRM Council still considers an earthquake as a Moderate Risk to Dumaguete City despite the fact that more high-rise buildings are being constructed. To put this risk in the low level the city Government of Dumaguete needs to strictly implement the building code of the city according to LDRRM.

v. IDENTIFIED CLIMATE CHANGE KEY DEVELOPMENT ISSUES

Table 16: Vision Reality Gap Result of Dumaguete City

Indicators of “Disaster Resilient” Sectors	Current Reality	Level of Attainment	Vision-Reality Gap	What to do to fill the gap
ECONOMIC				
- Strong competition among cities as sites for BPOs	- Economic opportunities lost for other cities. - Young people leaving Dumaguete City and migrating to other cities and countries.	5	5	- Continue coordination private sector, universities and government agencies such as DTI and DOST in continuing to promote Dumaguete as BPO site citing the city as one of the country’s top ten BPO locations. - Promote the city’s Investment Code of 2009 to business community in and outside the city.
- Investment Promotion Plan; City government website not updated and maintained.	- None or inaccurate information about Dumaguete for prospective investors and tourists. - Economic losses. [SEP]	4	6	- Prepare and investment promotion plan; Assign office or personnel to activate and update website.
- Affordable and sustainable electrical power supply.	- Increased operating costs of business. - Potential investors have second thoughts about investing in the city. - Economic disruptions and losses. [SEP]	4	6	- Provincial and city governments and private sector to negotiate with power producers/ distributors for a lower and affordable cost of electrical power supply.
- Direct air transport link between Dumaguete and Mindanao.	- Higher cost of doing business; - Higher travel costs between Dumaguete and Mindanao. - Delays in the movement of goods and services. - Limited number of goods traded. [SEP]	5	5	- Request air transport companies for direct air transport from Dumaguete City to Cagayan de Oro City or Davao City and vice versa.
- Facilities and services for university town.	- Housing facilities for students may not meet construction and sanitary standards. [SEP] - Petty crimes in and around educational institutions. [SEP]	5	5	- City government to regulate the construction and operation of boarding houses or living quarters for local and foreign students. - Increased police visibility around campuses, recreation areas frequented by students and the business district. [SEP]
- Decongestion of Public Market	- Vehicular congestion along Colon and Real streets. [SEP] - Increased noise, air and	5	5	- City government to identify, build and operate other public markets. [SEP]

Indicators of "Disaster Resilient" Sectors	Current Reality	Level of Attainment	Vision-Reality Gap	What to do to fill the gap
	wastewater pollution. - Unsanitary conditions in public market. - Decreased patronage of public market.			- Amend city ordinance limiting the sale of meat, meat products and fish to the public market.
- Culture of Tourism	- Lack of appreciation by the community of the impact of tourism on the economy and jobs. - Insufficient number of sanitary facilities for tourists. - Unsightly garbage on streets. - Abusive public transport driver and operators. - People's lack of support of city's anti-littering program. - Tourism promotion program not fully implemented.	6	4	- Information campaign for the community on the potentials of tourism and jobs. - Construct modern sanitary facilities in or near tourism sites. - Fully implement anti-littering city ordinance including fines and imprisonment. - Coordinate tourism promotion program with provincial government and travel industry stakeholders. - Update and maintain data on tourism.
- Sustainable food production in the city.	- Idle productive agricultural lands. - Inadequate capital resources and technology for food production. - Prices of locally produced farm products no longer competitive.	4	6	- SB legislation enabling the city to use idle lands and to lease the same to farmers; - Implementation of tax on idle lands per Local Government Code.
- Efficient Local Revenue Generation	- Low local revenue due to the city's outdated real property tax and market code; - Lost opportunities for increasing the delivery of public service due to low local revenue.	5	5	- Update and amend real property tax and market code. - Continue measures to improve collection of local revenue.
PHYSICAL				
Sufficient equipment and facilities for crime prevention and solution	Delayed response Ineffective security measures	5	5	National PNP to provide equipment's and facilities
Adequate number of fire hydrant	Inefficient response to fire incidence	5	5	Installation of additional hydrant
Construction of additional fire stations	Inefficient peace and order and response time	5	5	City Council ordinance to equip and fully operate the fire station in Barangay Daro
Additional flood control measures	Widespread impact of flooding in the center center	6	4	Construction of additional river control measures

Indicators of "Disaster Resilient" Sectors	Current Reality	Level of Attainment	Vision-Reality Gap	What to do to fill the gap
along Banica River				
SOCIAL				
Adequate opportunities and benefits to special sector and indigent in the community	<ul style="list-style-type: none"> - Not enough benefits for senior citizen. - Number of un attended street children - Poor communities 	4	6	<ul style="list-style-type: none"> - Full implementation of Gender and Development with corresponding budget as mandated by law (5%); Strengthen the KALIPI organizations and City Federation.
Disaster resilience of people living in disaster prone areas	Absence of relocation site for disaster victims and those affected by government projects.	5	5	<ul style="list-style-type: none"> - Safe and livable relocation sited

III. ADAPTATION AND MITIGATION ACTIONS:

i. IDENTIFIED ADAPTATION AND MITIGATION OPTIONS

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.

Production 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.

ii. **IDENTIFIED ENABLING REQUIREMENTS:**

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 and climatic variability 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 climate and 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 SBs Legislative Agenda:

Regulatory measures are also a necessary instrument of management in that they seek to prevent or pre-empt 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 CCA-DRR, 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 Sanggunian to encourage land use application of land use policies and land use planning in climate change adaptation and disaster risk reduction. 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 CCA-DRR in the LGU systems and processes.

IV. THE LOCAL CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION AND MANAGEMENT PLAN CONTENT AND 5-YEAR FINANCIAL PROJECTION:

i. THE MAJOR CCA-DRR PROGRAM:

The five-year Comprehensive Local Climate Change Adaptation and Disaster Risk Reduction and Management Plan of Dumaguete City, Negros Oriental consists of three major components namely; 1) Disaster Prevention and Mitigation Program 2) Local Climate Change Adaptation program, and 3) Disaster Preparedness and Response. These three major components describe the five year priority programs and project of the LGU for climate change adaptation and disaster risk reduction and management that will be funded by the 70% of the 5% Local Disaster Risk Reduction and Management Fund (LDRRMF).

This chapter will discuss how the three major components will address the vulnerability and exposure of community against the climatic variability and natural hazards that regularly hit the municipality.

Below is the summary of content of the three major components:

Disaster Prevention and Mitigation Program:

The Disaster Prevention and Mitigation Program touches the climate smart infrastructure component of climate change mitigation, adaptation and disaster risk reduction of the city. The major project and activities for the next six years will be focused on Physical Infrastructure and Engineering Support Project.

The priorities under the climate smart physical infrastructure project are the construction of flood and erosion control structures along rivers and water ways of Dumaguete City, Construction/ improvement/de-clogging of drainage system in various barangays of Dumaguete City, defining Lagnasan waterways in Barangay Banilad, Batinguel, Camanjac, Motong and Pulangtubig. Construction and improvement of shoreline protection and clearing and dredging of river and waterways are among the top priority for the next 6-years to mitigate flooding in Dumaguete City.

Climate Change Adaptation Program:

The key elements Climate Change Adaption Program focuses on non-structural component of climate change adaptation that will develop and enhance the resiliency of the community to climate change induced disasters. It is composed of 4- sub programs and projects namely; 1) Agriculture Resiliency Support, 2) Health Emergency Support, 3) and Environmental Protection and Management.

Disaster Preparedness and Response:

The objective of this program is to systematize the preparedness and responses of the LGU during disaster emergency situation to avoid loss of life and damage to property, agriculture infrastructure and other lifeline support system. Another thing is to develop a proactive measure in terms of providing assistance and support to affected communities on the event of disaster emergency. The activities and project under the Disaster Preparedness and Response Program are divided into two sub category, the 1) Internal System and General Operation Management that focuses on the purchases of hardware related to preparedness and response program as well as the maintenance and other operation expenses related to disaster. And number two category is concentrated on Organizational development of the ACDVs and CCA-DRR Staff and Council of the City and other programs or project identified by the municipality with similar nature and considered necessary.

ii. THE CLIMATE SENSITIVE LOCAL DISASTER RISK REDUCTION AND MANAGEMENT (LDRRM) FUND AND FINANCIAL PROJECTION:

Based on the proposed 5-year budget of Dumaguete City, Negros Oriental, the total 5% LDRRM Fund of the municipality for the next six years (2017 – 2022) amounts to **Two Hundred Twenty Eight Million, Nine Hundred Fifty Eight Thousand, Five Hundred Twenty Four Pesos and Fifty Centavos (₱ 228,958,524.50)**. The seventy percent of the 5% LDRRM Fund is computed at **One Hundred Sixty Million, Two Hundred Seventy Thousand, Nine Hundred Sixty Seven Pesos and Fifteen Centavos (₱ 160,270,967.15)** for the next six years. The balance of thirty percent amounting to **Sixty Eight Million, Six Hundred Eighty Seven Thousand, Five Hundred Fifty Seven Pesos and Thirty Five Centavos (₱ 68,687,557.35)** will be set aside as a Quick Response Fund (QRF) as per RA 10121 guidelines and related Memorandum Circulars (MCs) and Joint Memorandum Circulars (JMCs) issued by the DILG, DBM, COA and the NDRRMC. In order to come to a

realistic and conservative financial planning and budgeting for CCA-DRR Program, the LCCAP DRRM Council of Dumaguete City, Negros Oriental have decided to follow the circulars that allows only utilizing 70% of the 5% LDRRM fund for mitigation, prevention, preparedness and climate change adaptation.

Below is the breakdown of Dumaguete City, Negros Oriental 6-Year LDRRM Fund.

Table 17: Dumaguete City Climate Sensitive LDRRM Fund 6-Year Financial Projection

YEAR	5% LDRRM FUND	70% CCA-DRR OPERATIONAL BUDGET	30% QUICK RESPONSE FUND
2017	31,950,000.00	22,365,000.00	9,585,000.00
2018	32,269,500.00	22,588,650.00	9,680,850.00
2019	35,496,450.00	24,847,515.00	10,648,935.00
2020	39,046,095.00	27,332,266.50	11,713,828.50
2021	42,950,704.50	30,065,493.15	12,885,211.35
2022	47,245,775.00	33,072,042.50	14,173,732.50
TOTAL	228,958,524.50	160,270,967.15	68,687,557.35

iii. THE 6-YEAR CCA-DRRM PLAN ALLOCATION AND UTILIZATION:

The 5-Year LCCAP-DRRM Plan of Dumaguete City, Negros Oriental entails a total budget of **One Hundred Sixty Million, One Hundred Fifty Thousand, Five Hundred Sixty Six Pesos (₱ 160,150,566)**. These funding requirements will be sourced out from 5% Local Disaster Risk Reduction and Management Fund.

The Table below shows the per program percentage distribution of the 70% of the 5% LDRRM Fund of Dumaguete City allocated 25% of its budget to Local Climate Change Adaptation in the 6-Year budget plan.

Table 18: 6-Year Summary of Financial Resources needed by the LCCAP-DRRM Plan

Year	MDRRM Fund	70% DRR Operational Fund	30% Quick Response Fund	Disaster Prevention and Mitigation Program	% Allocation	Climate Change Adaptation Program	% Allocation	Disaster Preparedness Program	% Allocation	TOTAL DRR Budget Needed
2017	31,950,000.00	22,365,000.00	9,585,000.00	10,064,250.00	45%	5,591,259.00	25%	6,709,500	30%	22,365,010
2018	32,269,500.00	22,588,650.00	9,680,850.00	10,164,892.50	45%	5,741,862.50	25%	7,535,000	33%	23,441,756
2019	35,496,450.00	24,847,515.00	10,648,935.00	11,181,381.75	45%	6,656,048.00	27%	7,435,000	30%	25,272,430
2020	39,046,095.00	27,332,266.50	11,713,828.50	12,299,519.93	45%	7,037,100.00	26%	7,850,000	29%	27,186,621
2021	42,950,704.50	30,065,493.15	12,885,211.35	13,529,471.92	45%	8,032,858.00	27%	8,490,000	28%	30,052,330
2022	47,245,775.00	33,072,042.50	14,173,732.50	14,882,419.13	45%	7,700,000.00	23%	9,250,000	28%	31,832,420
TOTAL	228,958,524.50	160,270,967.15	68,687,557.35	72,121,935.23	45%	40,759,127.50	25%	47,269,500	30%	160,150,566

V. THE 5-YEAR CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION AND MANAGEMENT MATRIX PLAN:

**6-YEAR COMPREHENSIVE LOCAL CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION AND MANAGEMENT PLAN
DUMAGUETE CITY, NEGROS ORIENTAL
YEAR 2017-2022**

Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
		MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
A. Disaster Prevention and Mitigation Program		-	10,064,250	-	10,164,893	-	11,181,382	-	12,299,520	-	13,529,472	-	14,882,419	72,121,935
1	Climate Smart Infrastructure Support Program	-	10,064,250	-	10,164,893	-	11,181,382	-	12,299,520	-	13,529,472	-	14,882,419	72,121,935.23
1.1	Construction of Flood and Erosion Control Structures Along Rivers and Waterways	-	3,000,000	-	3,000,000	-	3,000,000	-	3,000,000	-	4,000,000	-	4,882,419	
1.2	Construction/Improvement/Declogging of Drainage Systems in Various Barangays	-	3,000,000	-	-	-	1,181,382	-	-	-	-	-	-	
1.3	Defining Lagnasan Waterway in Barangay Banilad	-	-	-	3,000,000	-	3,000,000	-	3,500,000	-	3,000,000	-	3,000,000	
1.4	Defining Waterways in Barangays Batinguel, Camanjac, Motong and Pulantubig	-	2,000,000	-	2,000,000	-	2,000,000	-	2,299,520	-	2,529,472	-	2,000,000	
1.5	Construction and Improvements of shoreline Protection	-	-	-	2,164,893	-	2,000,000	-	3,500,000	-	4,000,000	-	5,000,000	

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% = Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years	
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay		
1.6	Clearing and Dredging of Rivers and Waterways	CEO		2,064,250												
B. Local Climate Change Adaptation Program			5,591,259	-	5,741,863	-	6,656,048	-	7,037,100	-	8,032,858	-	7,700,000	-	40,759,128	
2	Agriculture Resiliency Support Program		2,591,259	-	2,400,000		2,540,000		2,920,000	-	3,262,000	-	4,000,000	-	17,713,259	
2.1	Small Water impounding	CAO														
2.2	Repair and maintenance of rain water harvesting storage	CAO	500,000		500,000		500,000		605,000		665,500		800,000			
2.3	Maintenance and repair of existing irrigation system	CAO	500,000		500,000		500,000		605,000		665,500		800,000			
2.4	Provision of climate adaptive crops and livestock	CAO, CVO	500,000		500,000		550,000		605,000		665,500		800,000			
2.5	Trainings on integrated f and livestock emergency guidelines and standards and Standard training for livestock (LEGS)	CAO/ CVO	500,000		400,000		440,000		500,000		600,000		800,000			
2.6	Farm waste (crops & livestock) management	CAO/ CVO	591,259		500,000		550,000		605,000		665,500		800,000			
3	Health and well Being Management Support Program		1,750,000	-	1,083,000	-	1,631,300.00	-	1,617,100	-	1,867,913	-	2,700,000	-	10,649,313	

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
3.1	Vector borne diseases prevention and control	CHO	500,000		573,000		1,070,300.00		1,000,000		1,189,103		1,500,000		
3.1a	Search and destroy of mosquito breeding sites	CHO													
	purchase of larvacides	CHO													
	inpregnation activities	CHO													
	provision of mosquito nets	CHO													
	provision of mosquito repellent lotion	CHO													
	provision of window screen a elementary schools	CHO													
	insecticide for adult mosquito control (green banded insecticide)	CVO													
3.1b	Leptospirosis prevention and control	CHO	250,000												
	provision of PPE's to rescuers, responders, health workers	CHO													
	provision of prophylaxis to waders	CHO													
	purchase of rat traps and rat baits	CVO	250,000												
3.2	Food and water diseases prevention and control	CHO	250,000		260,000		286,000.00		314,600		346,060		600,000		

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years	
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay		
3.2a	Diarrhea prevention and control	CHO														
	provision of water treatment pills/solutions	CHO														
	provision of water containers	CHO														
	purchase of insecticides	CVO														
3.3	Heat related diseases/disorders prevention and control	CHO														
	provision of medicines/ointments for skin diseases/eye diseases	CHO	250,000													
3.4	IEC on climate related diseases		250,000		250,000		275,000.00		302,500		332,750		600,000			
	provision of IEC,s on health related disorders, diarrhera prevention and control, vector borne diseases prevention and control,															
	reproduction of IEC materials	CHO, CVO														
4	Environmental Protection and Management		1,250,000	-	2,258,863	-	2,484,748	-	2,500,000	-	2,902,945	-	1,000,000	-	12,396,556	

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% = Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
4.1	Provision of equipment for biodegradable and recyclable waste to the barangays	ENRO	250,000		677,660		745,425		750,000		850,000		1,000,000		
4.1a	Construction of storage facility for special waste		250,000												
4.2	Construction of waste water storage tank	CEO			564,716		621,187		600,000		700,000				
4.3	Banica River and other waterways river bank stabilization	ENRO	250,000		338,829		372,712		400,000		450,982				
4.4	Marine protected areas establishment and enhancement	ENRO/AG	250,000		338,829		372,712		400,000		450,982				
4.5	Urban greening and mangrove reforestation	ENRO	250,000		225,886		248,475		250,000		300,654				
4.6	IEC. Capability building, partnership building, institution building and law enforcement	ENRO			112,943		124,237		100,000		150,327				
C. Disaster Preparedness Program			5,709,500	1,000,000	5,985,000	1,550,000	5,885,000	1,550,000	6,300,000	1,550,000	6,890,000	1,600,000	7,650,000	1,600,000	47,269,500
C.1. Internal System and General Operation Management			3,009,500	1,000,000	3,160,000	1,350,000	3,160,000	1,350,000	3,210,000	1,350,000	3,000,000	1,400,000	3,100,000	1,400,000	26,489,500
6	Disaster Response & Rescue Equipment and Maintenance and Operation		2,709,500	1,000,000	3,000,000	1,200,000	3,000,000	1,200,000	3,050,000	1,200,000	2,400,000	1,200,000	2,500,000	1,200,000	23,659,500

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
6.1	Purchase of additional needed rescue equipment & supplies					200,000		200,000		200,000		200,000		200,000	
6.2	Food and non food supply for pre-emptive evacuation		1,500,000		1,500,000		1,500,000		1,500,000		1,500,000		1,500,000		
6.3	Maintenance of Early Warning System		100,000		100,000		100,000		100,000		100,000		100,000		
6.4	Maintenance of rescue equipment, rubber boats and other rescue vehicles		100,000		100,000		100,000		100,000		150,000		200,000		
6.5	Uniforms/Vest T-shirts for rescue Volunteers, LDRRMO, LDRRMC		50,000		50,000		50,000		100,000		200,000		200,000		
6.6	Provision for Personnel Protective Equipment (PPE's)		100,000		100,000		100,000		100,000		150,000		150,000		
6.7	Materials for temporary shelter and installation of utilities(water, sanitation, electrical system) for relocation sites		709,500		1,000,000		1,000,000		1,000,000		150,000		200,000		
6.8	Purchas of Canopy (4meter x 4 meters		150,000		150,000		150,000		150,000		150,000		150,000		
6.9	Purchase of Rubber boat			1,000,000		1,000,000		1,000,000		1,000,000		1,000,000		1,000,000	
7	SUPPLIES or INVENTORIES		300,000	-	160,000	150,000	160,000	150,000	160,000	150,000	600,000	200,000	600,000	200,000	2,830,000

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
7.1	First Aid Supplies and Apparatus (Medicines, Nebulizer, Stethoscopes, Sphygmomanometer, Etc.)				10,000		10,000		10,000		200,000		200,000		
7.2	Medical Supplies in support for the 24/7 Ambulance Medical Rescue/Transport Operation		100,000		100,000		100,000		100,000		200,000		200,000		
7.3	Provision for payment of Insurance Premiums for group insurance of City Accredited disaster volunteers/ Civilian Volunteer's Organizations (ACDV's/CVO's)		50,000		50,000		50,000		50,000		200,000		200,000		
7.4	Provision for Personnel Protective Equipment (PPE's)		150,000			150,000		150,000		150,000		200,000		200,000	
C.2.	Organizational Development of DRRMC/DRRMO Members		2,700,000	-	2,825,000	200,000	2,725,000	200,000	3,090,000	200,000	3,890,000	200,000	4,550,000	200,000	20,780,000
8	CAPABILITY BUILDING		2,700,000	0	2,525,000	0	2,425,000	0	2,790,000	0	3,590,000	0	4,250,000	0	18,280,000
8.1	Capability Trainings for CDRRM Council Members, DRRMO Personnel and volunteers	DRRMO	200,000		200,000		200,000		300,000		400,000		500,000		

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
8.2	Personnel Enhancement Training (Firefighting, SAR,WASAR,USAR)	BFP	100,000		100,000.00		100,000.00		200,000.00		400,000.00		500,000.00		
8.3	Support to Capability Building on Health Emergency Management (650T/yr)														
8.4	Seminar and Conferences	DRRM O/C	300,000		215,000.00		215,000.00		300,000.00		500,000.00		500,000.00		
8.5	Conduct of yearly RESCUE Jamboree for Brgy. Rescue Personnel to encourage barangays to establish auxillary rescue teams	DRRM O	100,000		100,000										
8.6	Multi media campaign on emergency preparedness	DRRM O			20,000		20,000		100,000		200,000		200,000		
8.7	Fire Prevention operation and programs	BFP			100,000		100,000		100,000		200,000		200,000		
8.8	DRRMC Quarterly Assisment				50,000		50,000		50,000		50,000		50,000		
8.9	Support for 24/7 CDRRM Operation Center														
8.10															

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% =Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
8.11	Conduct DRRM seminars, drills & IEC's on disaster preparedness in school & other private institutions/NGO's		100,000		100,000		100,000		100,000		100,000		100,000		
8.12	Conduct Basic Life Support, First Aid, Fire & EQ Drills		200,000		200,000		200,000		200,000		200,000		200,000		
8.13	Organizing Brgy. Disaster Response Team thru regular trainings and drills		200,000		200,000		200,000		200,000		200,000		200,000		
8.14	Family Based Disaster Preparedness in all Brgy.'s		500,000		400,000		400,000		400,000		400,000		500,000		
8.15	Brgy. Contingency Planning for Barangay Officials and Community leaders (with evacuation and Camp Management, hazard & vulnerability Assessment)		450,000		400,000		400,000		400,000		400,000		500,000		
8.16	Operation Listo		50,000		50,000		50,000		50,000		50,000		50,000		
8.17	BDRRMC Planning		50,000		50,000		50,000		50,000		50,000		50,000		
8.18	Nutrition in Emergencies		250,000		240,000		240,000		240,000		240,000		500,000		
8.19	Seminar on Trauma healing/Stress the debriefing for victims of calamity		200,000		100,000		100,000		100,000		200,000		200,000		

	Activity	Office in Charge	2017 5% LDRRM Fund: Php31,950,000 70% = Php 22,365,000 30% = Php 09,585,000		2018 5% LDRRM Fund: Php35,496,450 70% = Php 22,588,650 30% = Php 09,680,850		2019 5% LDRRM Fund: Php35,495,450 70% = Php 24,847,515 30% = Php 10,648,935		2020 5% LDRRM Fund: Php39,046,095 70% = Php 27,332,226.50 30% = Php 11,713,828		2021 5% LDRRM Fund: Php42,950,704.50 70% = Php 30,065,493.15 30% = Php 12,026,197.26		2022 5% LDRRM Fund: Php47,245,775 70% = Php 33,072,042.50 30% = Php 14,173,732.50		Total for 5 Years
			MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	MOOE	Capital Outlay	
9	OTHER PROGRAM OR PROJECTS OF SIMILAR NATURE & CONSIDERED NECESSARY		-	-	300,000	200,000	300,000	200,000	300,000	200,000	300,000	200,000	300,000	200,000	2,500,000
9.1	Rental for temporary relocation and housing sites during calamity/ disaster victims				150,000		150,000		150,000		150,000		150,000		
9.2	Expenses for documentation of land acquired for temporary relocation sites of calamity victims	CMO/ CLO			50,000		50,000		50,000		50,000		50,000		
9.3	Purchase of additional needed rescue equipment & supplies					200,000		200,000		200,000		200,000		200,000	
9.4	Maintenance of Facilities/ Evacuation	DRRMO			100,000		100,000		100,000		100,000		100,000		
Subtotal			11,300,759	11,064,250	11,726,863	11,714,893	12,541,048	12,731,382	13,337,100	13,849,520	14,922,858	15,129,472	15,350,000	16,482,419	160,150,563
Total 70%			22,365,009		23,441,755		25,272,430		27,186,620		30,052,330		31,832,419		160,150,563
Quick Response and Post Disaster Risk Reduction Program(Utilization Of 30% QRF)															
10	Food and Non-Food Items requirements of disaster stricken areas.	LDRMMO	9,585,000		9,680,850.00		10,648,935		11,713,828.50		12,885,211.35		14,173,732.50		
Total 30%			9,585,000		9,680,850		10,648,935		11,713,829		12,885,211		14,173,733		68,687,557
GRAND TOTAL				31,950,009		33,122,605		35,921,365		38,900,448		42,937,541		46,006,152	228,838,120

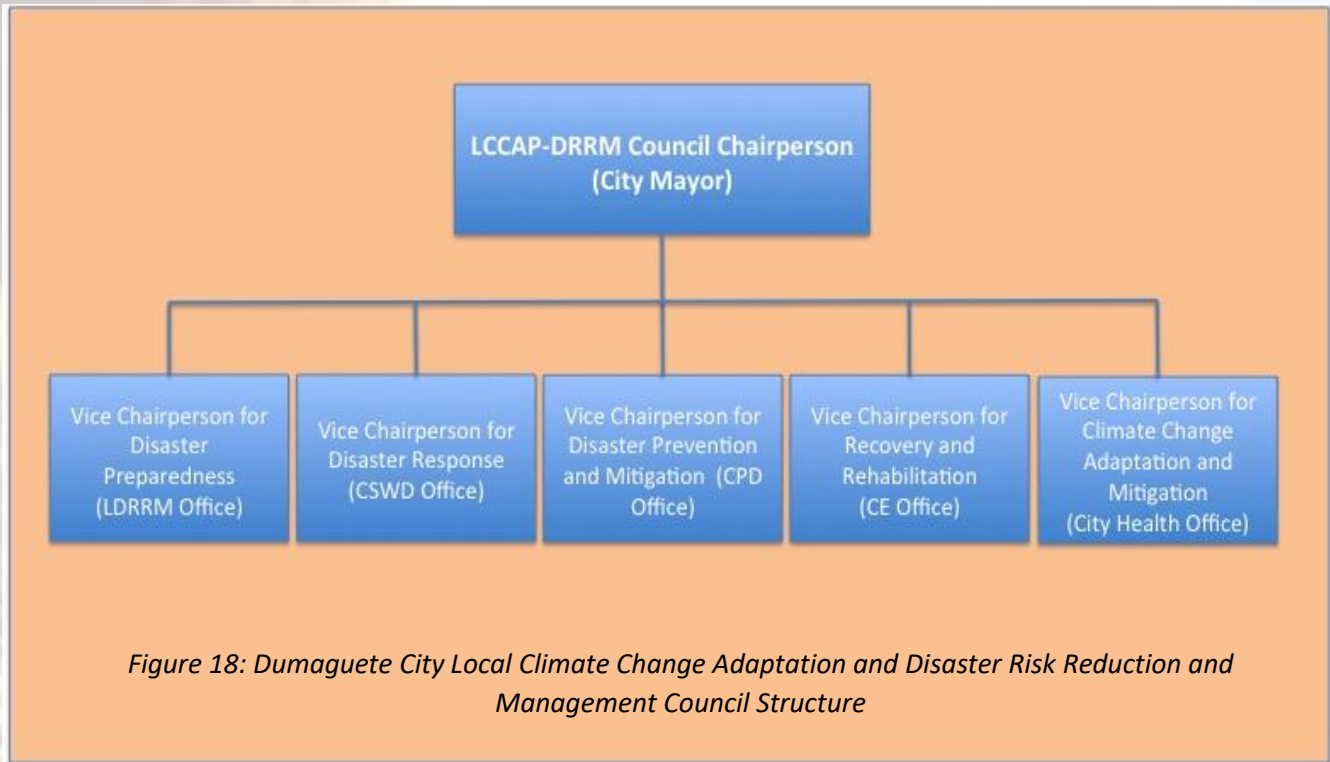
i. THE OVER-ALL SUMMARY OF BUDGET

**SUMMARY OF BUDGET FOR 6 YEAR COMPREHENSIVE LCCAP-DRRM PLAN IMPLEMENTATION
DUMAGUETE CITY, NEGROS ORIENTAL
YEAR 2017- 2022**

PROGRAMS		BUDGETARY REQUIREMENTS		TOTAL BUDGET REQUIRED	Percentage Breakdown of 70% of 5% LDRRM Fund
		5% LDRRMF	PEOPLE SURVIVAL FUND		
A. Disaster Prevention and Mitigation Program (35%)					
1	Climate Smart Infrastructure Support Program	72,121,935	0.00	72,121,935	45%
SUB-TOTAL		72,121,935	0.00	72,121,935	45%
Climate Change Adaptation Program (25%)					
2	Agriculture Resiliency Support Program	17,713,259	0.00	17,713,259	11%
3	Health and Well-being Management Support Program	10,649,313	0.00	10,649,313	7%
4	Environmental Protection and Management	12,396,555.50	0.00	12,396,555.50	8%
SUB-TOTAL		40,759,128	0.00	40,759,128	25%
C. Disaster Preparedness Program (40%)					
C.1 Internal System					
6	Disaster Response & Rescue Equipment and EWS Maintenance and Operation	23,659,500.00	0.00	23,659,500.00	15%
7	Supplies or Inventories	2,830,000.00	0.00	2,830,000.00	2%
SUB-TOTAL		26,489,500	0.00	26,489,500.00	17%
C.2. Organizational Development of LDRRMC/O Members					
8	Capability Building	18,280,000.00	0.00	18,280,000.00	11%
9	Other Programs or Projects of Similar Nature and Considered Necessary	2,500,000.00	0.00	2,500,000.00	2%
SUB-TOTAL		20,780,000.00	0.00	20,780,000.00	12.98%
GRAND TOTAL		160,150,563	0.00	160,150,563	100%

VI. GENERAL IMPLEMENTATION ARRANGEMENT

i. LOCAL CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION AND MANAGEMENT COUNCIL STRUCTURE:



Section 11 of RA 10121 states that, the existing City Disaster Coordinating Council (CDCC) shall henceforth be known as the City Disaster Risk Reduction and Management Council (CDRRMC). The Barangay Disaster Coordinating Council (BDCC) shall cease to exist and, it's power and functions shall henceforth be assumed by the existing Barangay Development Council.

The structural composition of the Dumaguete City Local Climate Change Adaptation and Disaster Risk Reduction and Management Council shall be headed by the City Mayor. Members of LDRRM are divided into five committees namely; 1) Disaster Preparedness Committee, 2) Disaster Response Committee, 3) Disaster Mitigation and Prevention Committee, 4) Rehabilitation and Recovery Committee and 5) Local Climate Change Adaptation and Mitigation Committee. Local Climate Change Adaptation and Mitigation was added in this structure to institutionalize climate change mitigation and adaptation initiative of LGU. Just like the structure of NDRRM, the specific membership of every committee were identified not as individual members but rather per LGU department to ensure the continuity of the programs being identified in this 5-year LDRRM Plan. According to the LDRRM it is very strategic to identify the committee members as per LGU department compared to appointing individuals, because people in the LGU departments will come and go but the department will remain even if a new set of political leaders will be elected every elections. The Table below will highlight the members of the LDRRM per committee.

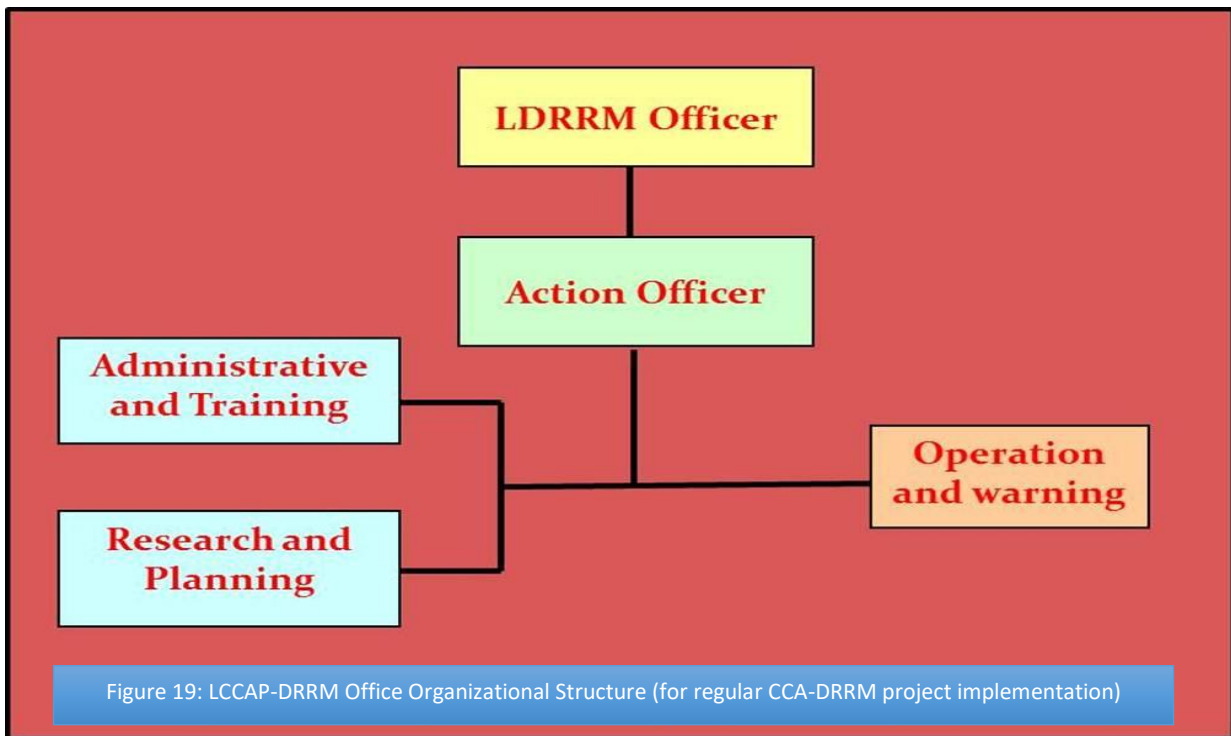
Table 19 List of LCCAP DRRM Council Members

LDRRMC Committees	DEPARTMENT AND INSTITUTION MEMBERS
1. Disaster Preparedness Committee	<p>Chair: LDRRM Office / Rescue 348</p> <p>Members:</p> <ul style="list-style-type: none"> - City Social Welfare and Development (CSWD) Office - Philippine Red Cross (PRC) - Department of Interior and Local Government (DILG) - Public Information Office (PIO) - Association of Barangay Captains (ABC) Pres. - Department of Education (DepEd) - Negros Oriental Hotels and Restaurants Association
2. Disaster Response Committee	<p>Chair: City Social Welfare and Development (CSWD) Office</p> <p>Members</p> <ul style="list-style-type: none"> - City Budget Office (CBO) - City Accounting Office (CAO) - City Treasurer's Office (CTO) - Philippine National Police (PNP) - Bureau of Fire Protection (BFP) - Rescue 348 - City Traffic Management Office (CTMO) - Armed Forces of the Philippines (AFP) - Philippine Coast Guard (PCG) - Negros Oriental Chamber of Commerce
3. Disaster Mitigation and Prevention Committee	<p>Chair: City Planning and Development Office (CPDO)</p> <p>Members</p> <ul style="list-style-type: none"> - City Environment and Natural Resources Office (CENRO) - City Veterinary Office (CVO) - City Health Office (CHO) - Office of City Agriculturist (OCA) - Silliman University (SU) - Foundation University (FU) - Negros Oriental State University (NORSU)
4. Rehabilitation and Recovery Committee	<p>Chair: City Engineering Office (CEO)</p> <p>Members</p> <ul style="list-style-type: none"> - General Services office (GSO) - City Social Welfare and Development (CSWD) Office - Gender and Development (GAD) Office - City Legal Office (CLO) - Local Contractors Association (LCA) - Philippine Institute of Civil Engineers (PICE) – Negros Oriental - Negros Oriental Electric Cooperative (NORECO) - St. Paul University - Philippine Maritime Academy (PMA)
5. Local Climate Change Mitigation and Adaptation Committee	<p>Chair: City Health Office (CHO)</p> <p>Members:</p> <ul style="list-style-type: none"> - City Environment and Natural Resource Office - City Agriculture Office - City Social Welfare and Development Office - Silliman University - Association of Barangay Council

LCCAP-DRRM OFFICE ORGANIZATIONAL STRUCTURE:

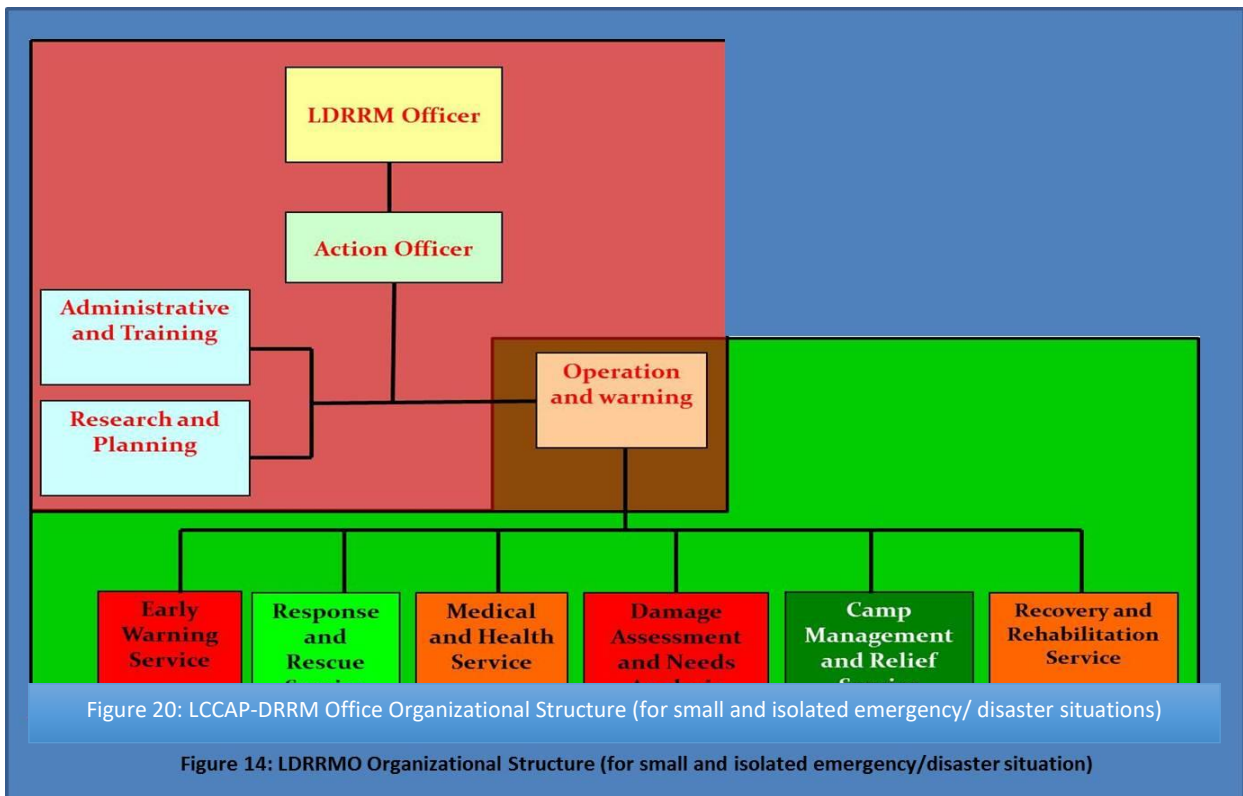
The Local Disaster Risk Reduction and Management Council defined this structure during the 3-day LCCAP-DRRM Planning and Budgeting Workshop. This structure consists of 3 levels to make it suitable to the different type of situations in the course of implementation of the LDRRM Plan.

- a) **LEVEL 1 Organizational Structure** – Implementation of regular CCA and DRRM program and project including initiative on climate change adaptation and mitigation was consider as primary tasks of the level 1 organizational structure



For the regular implementation of DRRM and CCA Programs and Projects and such minor emergencies that requires only monitoring and small level responses, the organizational structure and protocol shown in figure 19 will be in operation to accommodate the level of response needed. The LDRRM Officer and the Deputy/Action Officer of the DRRMO will be on top of the Chain of Command with the regular staff from Administrative & Training; Research & Planning; and Operations & Warning plus some volunteers on hand to fulfill the office functions on a regular basis.

- b) **LEVEL 2 Organizational Structure: Small to Moderte or Isolated Emergencies/Disaster Situations.**



When a disaster situation occurs and can be classified as a relatively small or medium emergency with an anticipated minimal amount of possible damage and affected population, this structure in figure 14 will serve as the working structure of the Local Climate Change Adaptation and Disaster Risk Reduction and Management Office (LDRRMO) of Dumaguete City. The City Mayor or the Local Disaster Risk Reduction and Management Officer will act as the Head of the Emergency Management Team (EMT). The Administrative and Training Officer together with the Research and Planning Officer will serve as Secretariat and Administrative support to the Operations and Warning Desk. The Deputy/Action Officer and the Operations and Warning Officer shall be responsible for the defining and execution of the Emergency/Disaster Operations or Contingency plan of the LDRRMO, in coordination with the Action Service Commands which are the following:

- **Early Warning Service Command (EWSC)** – The EWSC shall be headed by the ABC President with the Barangay Captains and SK Chairpersons of the 30 Barangays of Dumaguete City, Local PNP and the City Public Information Office as institutional or department members.
- **Response and Rescue Service Command (RRSC)** – The RRSC shall be headed by the Dumaguete City Rescue 348 with the assistance of One Rescue Team, Philippine Red Cross, Silliman Fire Brigade, BFP, PNP, Philippine Army, Chinese Volunteers, Philippine Coast Guard, ENRO and the City Engineering Office as the Institutional/ Department Members.

- **Medical and Health Service Command (MHSC)** – This service command shall be headed by the City Health Office as service command Team Leader. The members of MHSC are the City Veterinary Office, Philippine Medical Association (Dgte Chapter) and the Philippine Nursing Association (Dgte Chapter).
- **Damage Assessment and Needs Analysis Service Command (DANA-SC)** – DANA-SC shall be headed by the City Administrator’s Office as Team Leader with the assistance of the City Planning and development Office (CPDO), Office of the City Agriculturist (OCA), City Veterinary Office, and the Philippine Institute of Civil Engineers as members.
- **Camp Management and Relief Service Command (CaMReSC)** – CaMReSC team leader is the City Social Welfare and Development Office (DCSWDO) with PNP and DepED as service command members.
- **Recovery and Rehabilitation Service Command (RRSC)** – This service command shall be headed by the City Engineering Office as team leader, with the City Accounting Office, NORECO, GSO, ENRO DCWD and the TELCOs as service command members.

The above mentioned departments and institutions were objectively chosen by the LDRRMC of Dumaguete City based on the related function of their office or group, and qualifying capabilities such as skills and expertise, knowledge, and experience relative to the requirements needed for the LDRRMO Action Service Command. Below is the illustration of the members of Dumaguete City LDRRMO Action Service Command.

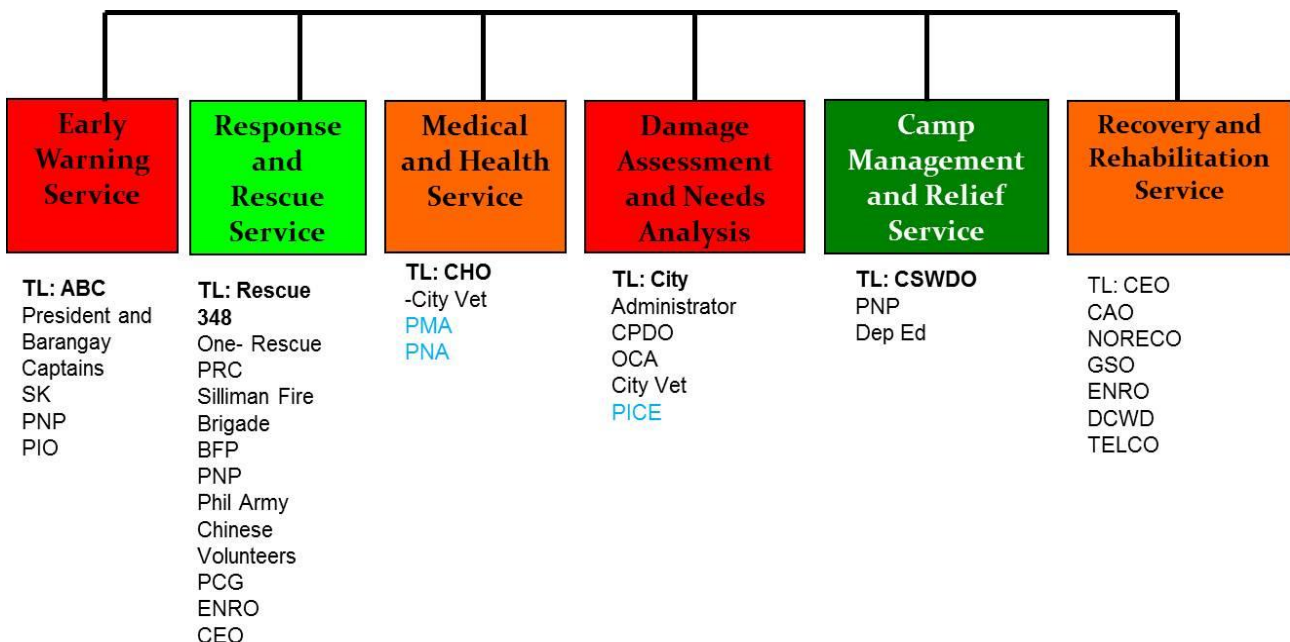
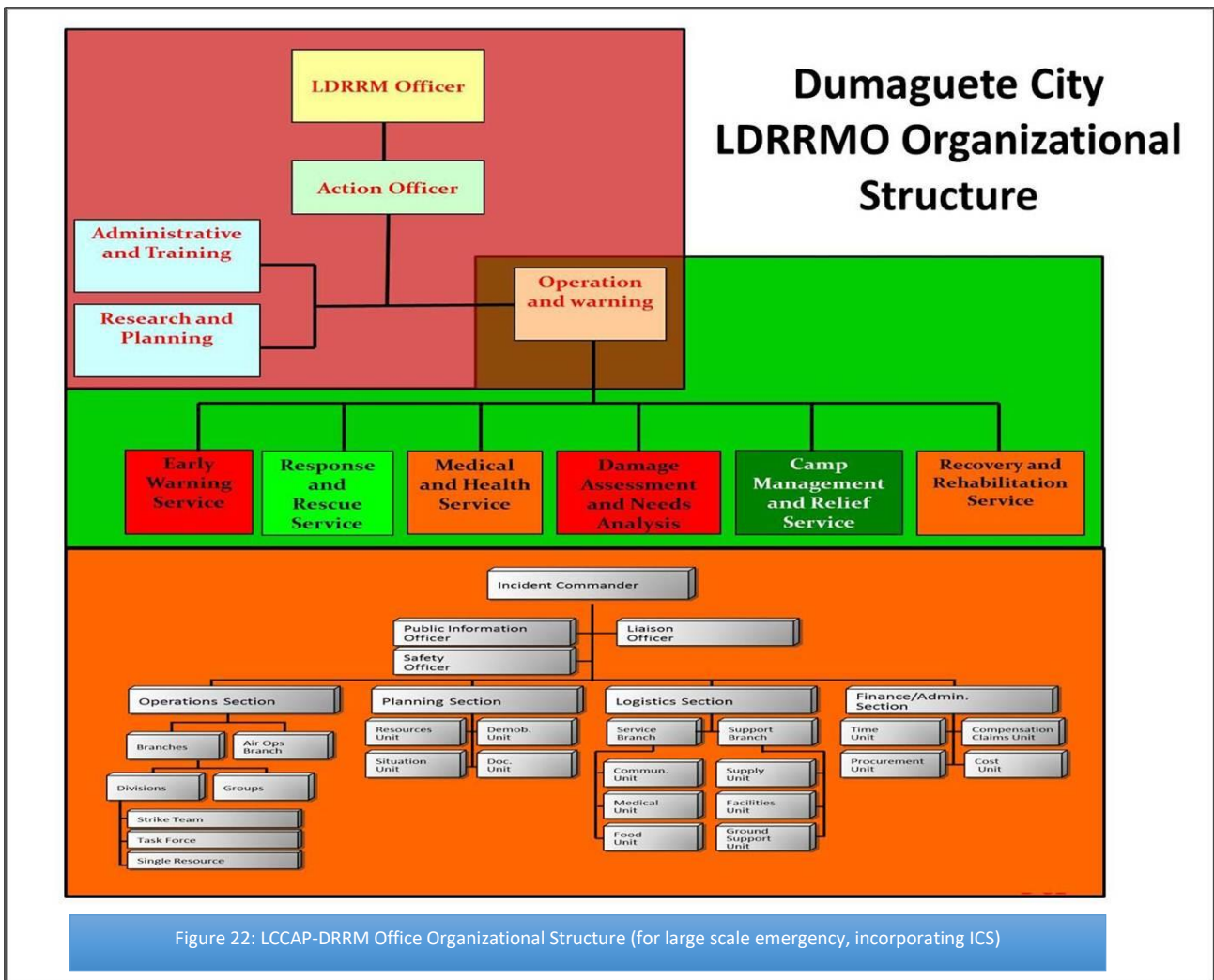


Figure 21: LDRRMO Service Command Team Leaders and Members

c) **LEVEL 3 Organizational Structure: Large Scale and/or Complex Emergencies and Disaster Situations.**



Typical examples of Large scale and/or Complex Emergency/Disaster situations is the occurrence of events such as Tropical Storm SENDONG in December 2011, the February 2012 Guihulngan Earthquake, Tropical Storm PABLO in December 2012, or as may be determined by the LDRRM Council. In Emergency/Disaster situations like this the LDRRMC members have agreed that the adoption and incorporation of the Incident Command System (ICS) as shown in figure 16, will be more effective because of its modular structure and adaptability to any rapidly expanding situation, especially with multi-agency participation, and therefore highly functional and will serve as the working structure that will be applied by the LCCAP-DRRM Office in Dumaguete City.

The Incident Command System (ICS), with its Incident Command Post near the vicinity of the incident site, and its Incident Management Team under the direction of the Incident Commander, will be operating under the guidance and directive of the Operations Center managed by the LDRRM Council with the City Mayor as Chairman and Over-all Head. The Operations Center will provide the necessary logistical and manpower support to the entire operations of the Incident Management Team.

The LDRRM Officer may be designated by the City Mayor as the Incident Commander, or as the case may be like Sea incidents (Coast Guard), Fire (BFP), Terroristic threats like bombing, chemical or biological (PNP or AFP) etc, any such individual or officer of any gov't office/agency whose background, training, expertise or experience highly qualifies him for that specific incident to be the Incident Commander of the whole operations of the Incident Management Team. In which case, the LDRRM Officer, due to his familiarity with the locality and local organizational set-up, can ably support the designated Incident Commander by being the deputy IC.

The LDRRM Officer, whether designated as Incident Commander or deputy to the IC, shall be responsible for the deployment of personnel of the Action Service Command, or the Department/Institutional service command team leaders and members to various posts as will be required and necessary within the ICS organizational structure. The LDRRM officer shall also ensure that all instructions are clear and well disseminated to everyone concerned as well as provide regular report to the Incident Commander, or as the Incident Commander himself, to the LDRRM Council at the Operations Center.

ii. TASKS, FUNCTIONS AND DEPARTMENTS INVOLVED:

- LDRRMC

The composition of the Dumaguete City Local Climate Change Adaptation-Mitigation and Disaster Risk Reduction and Management Council are the following:

- City Mayor as the Chairperson of the LCCAP-DRRM Council
- The Disaster Risk Reduction and Management Officer
- DRRMO Deputy/Action Officer
- Public Information Office (PIO)
- City Planning and Development Office (CPDO)
- City Social Welfare and Development (CSWD) Office
- Gender and Development (GAD) Office
- City Environment and Natural Resources Office (CENRO)
- City Veterinary Office (CVO)
- City Health Office (CHO)
- City Budget Office (CBO)
- Office of City Agriculturist (OCA)
- City Accounting Office (CAO)
- City Engineering Office (CEO)
- General Services office (GSO)
- City Treasurer's Office (CTO)
- City Traffic Management Office (CTMO)
- City Legal Office (CLO)
- Department of Interior and Local Government Office (DILG)
- Philippine National Police (PNP)
- Bureau of Fire Protection (BFP)
- Philippine Coast Guard (PCG)
- Armed Forces of the Philippines (AFP)

- Philippine Red Cross (PNRC)
- City Council Representative
- Association of Barangay Captains (ABC) Pres.
- Department of Education (DepEd)
- Civil Society Representatives:
 - Silliman University (SU)
 - Foundation University (FU)
 - Negros Oriental State University (NORSU)
 - St. Paul University
 - Philippine Maritime Academy (PMA)
 - Local Contractors Association (LCA)
 - Philippine Institute of Civil Engineers (PICE) – Negros Oriental
 - Negros Oriental Electric Cooperative (NORECO)
- Private Sector Representatives:
 - Negros Oriental Hotels and Restaurants Association
 - Negros Oriental Chamber of Commerce

The Dumaguete City Local Disaster Risk Reduction and Management Council shall have the following tasks and functions:

- Disaster Risk Reduction and Management policy recommendatory body to the Sangguniang Panglungsod;
 - Approve, monitor and evaluate the implementation of the LDRRMPs and annually review, test and develop the plan consistent with other national and local planning programs;
 - 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;
 - Recommend the implementation of forced or pre-emptive evacuation of local residents, if necessary.
- LDRRM Office

The LDRRMO shall be composed of the LDRRM Officer, the Deputy/Action Officer and the following staff: 1) Administrative and Training 2) Research and Planning and 3) Operations and Warning.

The Action Service Team is composed of the following:

- Early Warning Service - ABC President
- Rescue and Evacuation Service - Dumaguete Rescue 348
- Medical and Health Service - City Health Officer
- Damage Assessment and Needs Analysis - City Administrator
- Camp Management and Relief Service - City Social Welfare & Development officer
- Recovery and Rehabilitation Service - City Engineering officer

The Dumaguete City LDRRM Office, in coordination with concerned national and local agencies and instrumentalities, shall perform the following functions with impartiality, given the emerging challenges brought about by disasters in our present time:

- Design, program and coordinate Disaster Risk Reduction and Management activities consistent with the National Council's standards and guidelines;

- Facilitate and support Risk Assessments and Contingency Planning activities at the barangay level;
- Consolidate local disaster risk information which includes natural hazards, vulnerabilities, climate change risks, and maintain a local risk map;
- Organize and conduct training, orientation, and knowledge management activities on Disaster Risk Reduction and Management at the barangay level;
- Operate a multi-hazard early warning system, a major component of 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;
- Formulate and implement the Dumaguete City comprehensive and integrated LDRRM Plan in accordance with the national, regional and provincial framework, and policies on disaster risk reduction in close coordination with the local development council (LDC);
- Prepare and submit to the local Sanggunian through the LDRRMC and the LDC the annual LDRRMO Plan and budget, the proposed programming of the LDRRM Fund, other dedicated disaster risk reduction and management resources, and other regular funding source/s and budgetary support of the LDRRMO/BDRRMC;
- 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;
- Identify, assess and manage the hazards, vulnerabilities and risks that may occur in the 30 barangays of Dumaguete City;
- Disseminate information and raise public awareness about those hazards, vulnerabilities and risks, their nature, effects, early warning signs and counter-measures;
- Identify and implement cost-effective risk reduction measures/strategies;
- Maintain a database of human resources, equipment, directories, and location of critical infrastructures and their capacities such as hospitals and evacuation centers;
- Develop, strengthen and operationalize mechanisms for partnership or networking with the private sector, CSOs, and volunteer groups;
- 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 Dumaguete City;
- Organize, train, equip and supervise the Dumaguete Rescue 348 and the ACDVs, ensuring that humanitarian aid workers are equipped with basic skills to assist mothers to breastfeed;
- 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 and children can find help with breastfeeding, feed and care for their babies and give support to each other;
- Within the territorial jurisdiction of Dumaguete City, promote and raise public awareness of and compliance with RA 10121 and legislative provisions relevant to the purpose of RA 10121;
- Serve as the secretariat and executive arm of the LDRRMC;

- Coordinate other disaster risk reduction and management activities;
- Establish linkage/network with other LGUs for disaster risk reduction and emergency response purposes;
- Recommend through the LDRRMC the enactment of local ordinances consistent with the requirements of RA 10121;
- Implement policies, approved plans and programs of the LDRRMC consistent with the policies and guidelines laid down in RA 10121;
- Establish the Dumaguete City Local Disaster Risk Reduction and Management Operations Center;
- Prepare and submit, through the LDRRMC and the CDC, the report on the utilization of the LDRRM Fund and other dedicated Disaster Risk Reduction and Management resources to the local Commission on Audit (COA) copy furnished the regional director of the OCD and the Local Government Operations Officer of the DILG; and
- Act on other matters that may be authorized by the LDRRMC.

ii. THE IDENTIFIED EMERGENCY EVACUATION AREAS OF DUMAGUETE CITY

In compliance with RA 10121 and Memorandum Circulars on Disaster Risk Reduction issued by the Department of Interior and Local Government (DILG), Dumaguete City through its Local Disaster Risk Reduction and Management Office (LDRRMO) have identified possible evacuation areas in preparation for a worst case scenario happening.

Dumaguete City to date has a population of around 25,000 families/households. With an assumption that 20% of the population will be affected in a worst case scenario, 5,000 families will have to be evacuated. Taking into account each family will require a minimum of 8 sqm living space, a total of 4 hectares (5,000 families x 8 sqm = 40,000 sqm) will be critically needed as evacuation site.

Sorely lacking this huge area requirement at present, the LDRRM Council has settled on a solution of accounting of all available spaces in all private and public schools, the private sector, and the 30 barangays in the city with facilities such as Gymnasiums & Halls, Ball fields & covered Courts, Classrooms, Churches & Chapels, Barangay halls & Government bldgs, and other such similar places which have been flood free in the past and assessed to be relatively safe and secure as evacuation sites in the near future.

The LDRRM Office through the mandate of the LDRRM Council shall establish and maintain a strong link and coordination with school heads, barangay captains as well as heads of institutions and the private sector, and if possible execute a memorandum of agreement (MOA) between the city and these entities to ensure that utilization of such facilities will be granted during emergencies.

iii. THE INCIDENT COMMAND SYSTEM OF DUMAGUETE CITY

Defining the Incident Command System of Dumaguete City will be critical to avoid confusion among the key players in disaster response and will greatly help the LCCAP-DRRMO and BDRRMCs to facilitate a systematic and orderly response operations when a calamity strikes. The ICS of the city will be divided into two Emergency Command Protocols, 1) The Barangay Emergency Command Protocol and 2) City-wide Emergency Command Protocol.

- *The Barangay Emergency Command Protocol* – When a disaster strikes in a barangay the responsibility to take lead in the response operations lies with the Barangay Captain, to be assisted by the Barangay Disaster Risk Reduction and Management Committee. All support groups coming from the city and other areas responding to the emergency in the barangay should report first to the Barangay Captain for proper briefing and instructions before any response operation can be initiated by the group. The BDRRMC will as soon as practicable conduct Damage Assessment and Needs Analysis of the disaster and the information gathered will be the official report to be submitted to LDRRMO for proper action. The BDRRMC will also initiate the establishment of a Command Post or Operations Center, if necessary, to have an organized and effective response.

- *The City-wide Emergency Command Protocol* – When two or more barangays are affected by an Emergency/Disaster situation, the responsibility for immediate response at all levels rest with the LDRRM Office. The LDRRM Officer or the City Mayor will act as the Incident Commander and Dumaguete City Rescue 348 will immediately initiate the Emergency Command Protocol and coordinate the medical, rescue and evacuation procedures to be assisted by the City Health Office (CHO), City Social Welfare office, Planning and Development Office (CSWDO), Philippine National Police, Bureau of Fire, Red Cross, Dep't of Education, the BDRRMCs concerned, and other agencies tasks with the capability to respond and assist in such an emergency. The City Administrator's Office, as head of DANA-SC of the LDRRMO, will conduct the Damage Assessment and Needs Analyses that will serve as the official documentation/report of the city, to be submitted to the Sangguniang Panglungsod for the declaration of a State of Calamity if necessary, and to the higher authorities for assistance of any kind.

iv. INSTITUTIONAL WORKING ARRANGEMENT

- There shall be mutual cooperation among and between the LDRRMO, other city departments such as CSWDO, OCA, CEO, CHO CPDO, CENRO among others, and DepED, BDRRMCs and Accredited Community Disaster Volunteers in the implementation of this comprehensive 6-Year LCCAP-DRRM Plan;
- Quarterly or semi-annual Plans and Progress reports of LDRRM activities shall likewise be made to the City Council and other funding partners for information, technical and management guidance;
- The LCCAP-DRRMC shall actively participate in and support local policy proposals, including discussions and decisions relative to formulation, amendment and/or modifications of local policies pertinent to local disaster risk reduction especially in three core programs namely: disaster prevention, mitigation and preparedness;
- Accountability for the regular reporting system to the public and concerned officials belongs to the LCCAP-DRRM Officer.

v. GENERAL MONITORING AND EVALUATION FRAMEWORK

Monitoring and evaluation is the process of gathering, filing, accessing and analyzing information that will enable the City Mayor as LDRRM Council Chairman, to determine the progress of the implementation of the LCCAP-DRRM 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 LDRRMO shall be primarily responsible in carrying out monitoring and evaluation activities that will be reviewed by the LCCAP-DRRM Council as the overseeing body of the city for Disaster Risk Reduction and Management and Climate Change Adaptation program.

The LCCAP-DRRM Office shall submit a semi-annual report to the LCCAP-DRRMC and to the City Mayor informing them of the status of implementation of the approved LDRRM programs and projects for the period.

REFERENCES:

The 2016 Annual Budget of Dumaguete City, Negros Oriental. City Budget Officer File

The 10 year Comprehensive Land-Use Plan of Dumaguete City

RA 10121 Primer

German Development Local Climate Change Data Preparation Manual

Country Assessment Report for the Philippines – Strengthening Hydro-meteorological Service for Southeast Asia – UNISDR, the World Bank, World Meteorological Organization, PAGASA and Global Facilities for Disaster Reduction and Recovery

DENR-MGB Geo-hazard Assessment 2006.

NDRRMC-DBM-DILG Joint Memorandum Circular No. 2013-1.

NDRRMP 2011-2028.