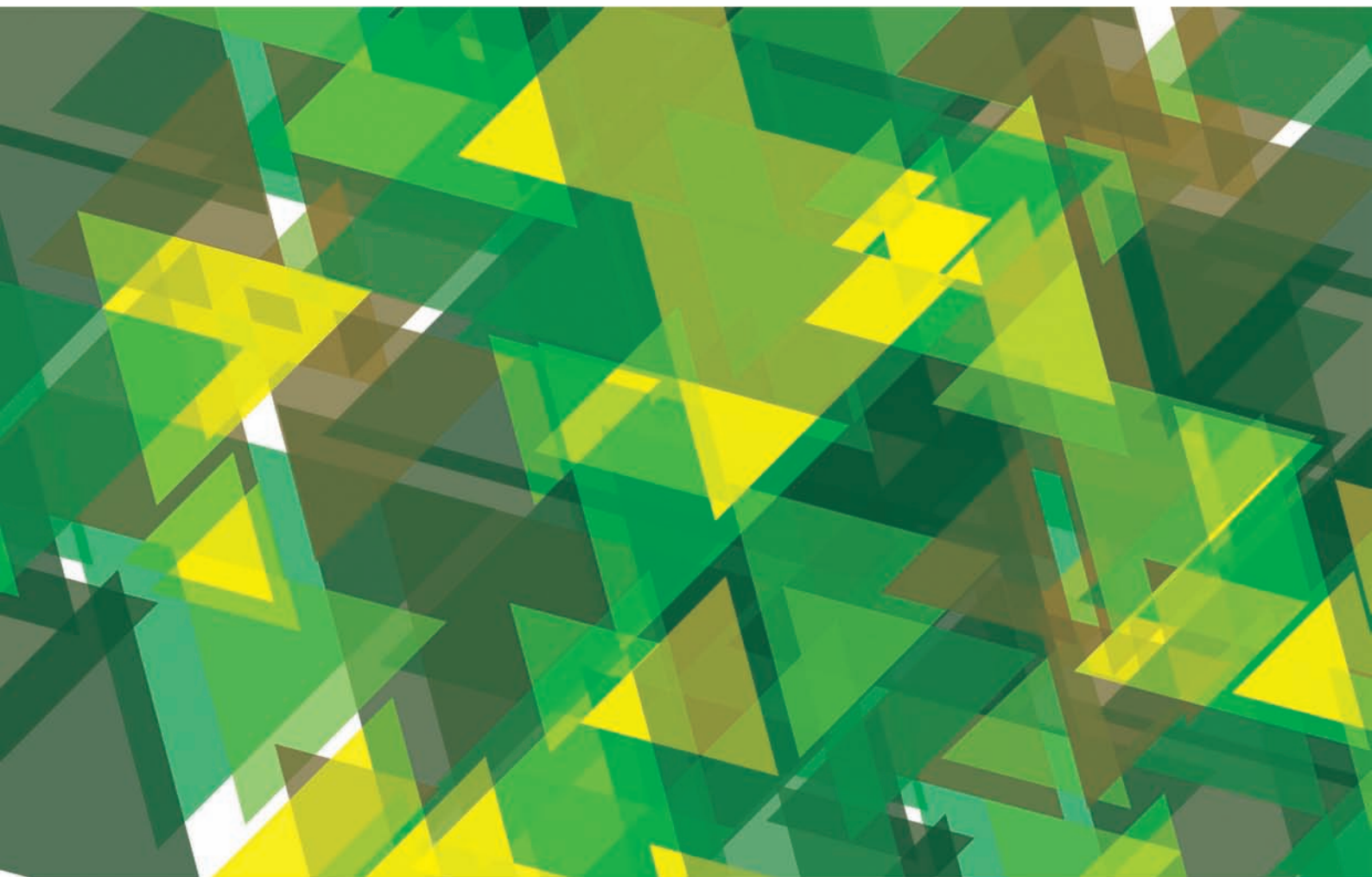


# **SUPPLEMENTAL GUIDELINES**

## **ON MAINSTREAMING CLIMATE AND DISASTER RISKS IN THE COMPREHENSIVE LAND USE PLAN**



# **EXECUTIVE SUMMARY**

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For inquiries, please contact:

Climate Change Commission  
2U LPLP Building, JP Laurel St  
Malacañang Compound, Manila City  
Email: [info@climate.gov.ph](mailto:info@climate.gov.ph)

Housing and Land Use Regulatory Board  
HLURB Bldg., Kalayaan Avenue, cor. Mayaman St., Diliman,  
Quezon City 1101, Philippines  
Email: [pdg@hlurb.gov.ph](mailto:pdg@hlurb.gov.ph)



PROJECT CLIMATE  
**Twin Phoenix**

*Understanding disaster risks in a changing climate,  
Working towards sustainable recovery.*

# **SUPPLEMENTAL GUIDELINES**

## **ON MAINSTREAMING CLIMATE AND DISASTER RISKS IN THE COMPREHENSIVE LAND USE PLAN**





# Supplemental Guidelines on Mainstreaming Climate and Disaster Risks in the Comprehensive Land Use Plan

## EXECUTIVE SUMMARY

A climate- and risk-sensitive comprehensive land use plan (CLUP) and zoning ordinance (ZO) both adopt a comprehensive approach in lessening impacts of disasters, including climate change, on local development processes. It seeks to rationalize the location of people, assets, and economic activities, address current risks and vulnerabilities, and enhance adaptive capacities towards safer, resilient, and sustainable human settlements. The integration of climate and disaster risks in the CLUP and ZO will allow local government units to:

1. Learn more of the natural hazards and climate change and how these would likely alter the development path of the locality;
2. Understand risks posed by natural hazards and climate change on exposed areas, sectors and communities through the analysis of sensitivities, vulnerabilities, and adaptive capacities;
3. Identify priority decision areas and development challenges posed by climate change and natural hazards;
4. Adjust projections on demand and supply of land for settlements, production, protection, and infrastructure development given the impacts of climate change and natural hazards, and existing risks and vulnerabilities;
5. Incorporate spatial development goals, objectives and targets to reduce risks;
6. Make informed decisions to effectively address risks and vulnerabilities by weighing alternative spatial strategies, land use allocation, and zoning regulations;
7. Identify appropriate risk reduction and climate change adaptation and mitigation measures as inputs to the comprehensive development plan and budget.

## Mainstreaming Framework

Mainstreaming involves two phases: first, the conduct of climate and disaster risk assessment (CDRA), and second, integrating the results of the CDRA in the various steps of the CLUP formulation process. The CDRA uses a six-step process. It involves organizing climate change and hazard information; scoping of potential spatial or areal, and sectoral impacts; developing an exposure database; conducting a climate change vulnerability assessment; conducting a disaster risk assessment; and summarizing findings. The CDRA facilitates the identification of priority decision areas, development challenges, implications and policy interventions, with emphasis on risk reduction and climate change and adaptation options.

The second phase involves the integration of the results of the CDRA in the CLUP formulation process with the following entry points: situational analysis, visioning, goals and objective setting, development thrust and spatial strategy generation, land use plan and policy framework detailing, zoning, plan implementation, monitoring and evaluation.

## The Climate and Disaster Risk Assessment (CDRA)

The Climate and Disaster Risk Assessment is the process of studying risks and vulnerabilities of exposed elements namely, the people, urban areas, agriculture, forestry and fishery production areas, critical point facilities, lifelines and other infrastructure associated with natural hazards and climate change. It seeks to establish risk and vulnerable areas by analyzing the underlying factors on hazard, exposure, vulnerability/sensitivity, and adaptive capacities. The CDRA facilitates the identification of priority decision areas and allow the identification of various disaster risk reduction and climate change adaptation measures in the form of land use policy interventions (i.e. land use policies, zoning provisions, support legislation, programs and projects) to address current and prevent future risks and vulnerabilities. The CDRA involves six major steps, namely:

1. **Collect and organize climate change and hazard information** - Data gathering on projected climate change scenarios, and hazards (i.e. spatial extent, magnitude, intensity, frequency), consultation with mandated agencies, and understanding historical damage data, and anecdotal accounts;
2. **Scope the potential impacts of climate change and hazard** - Scoping potential impacts on areas covered by the geographical extent of hazards and areas potentially affected by the impacts of climate change
3. **Develop the exposure database** - Building data on exposed elements in the impact areas covering population, urban use areas, natural-resource-based production areas, and critical point and lifeline facilities, including area-/element-based vulnerability/sensitivity and adaptive capacity indicators;
4. **Conduct climate change vulnerability assessment (CCVA)** - Assessing vulnerability to climate change based on the degree of exposure, sensitivity, and adaptive capacity of the elements in areas likely to be affected by climate change;
5. **Conduct disaster risk assessment** - Assessing risks from hazards based on the likelihood of occurrence and intensity of the hazard, exposure, vulnerability, and adaptive capacity
6. **Summarize findings** - Establishing priority decision areas and identification of spatial development challenges, issues and concerns, and implications, and policy interventions in the form or risk management options.

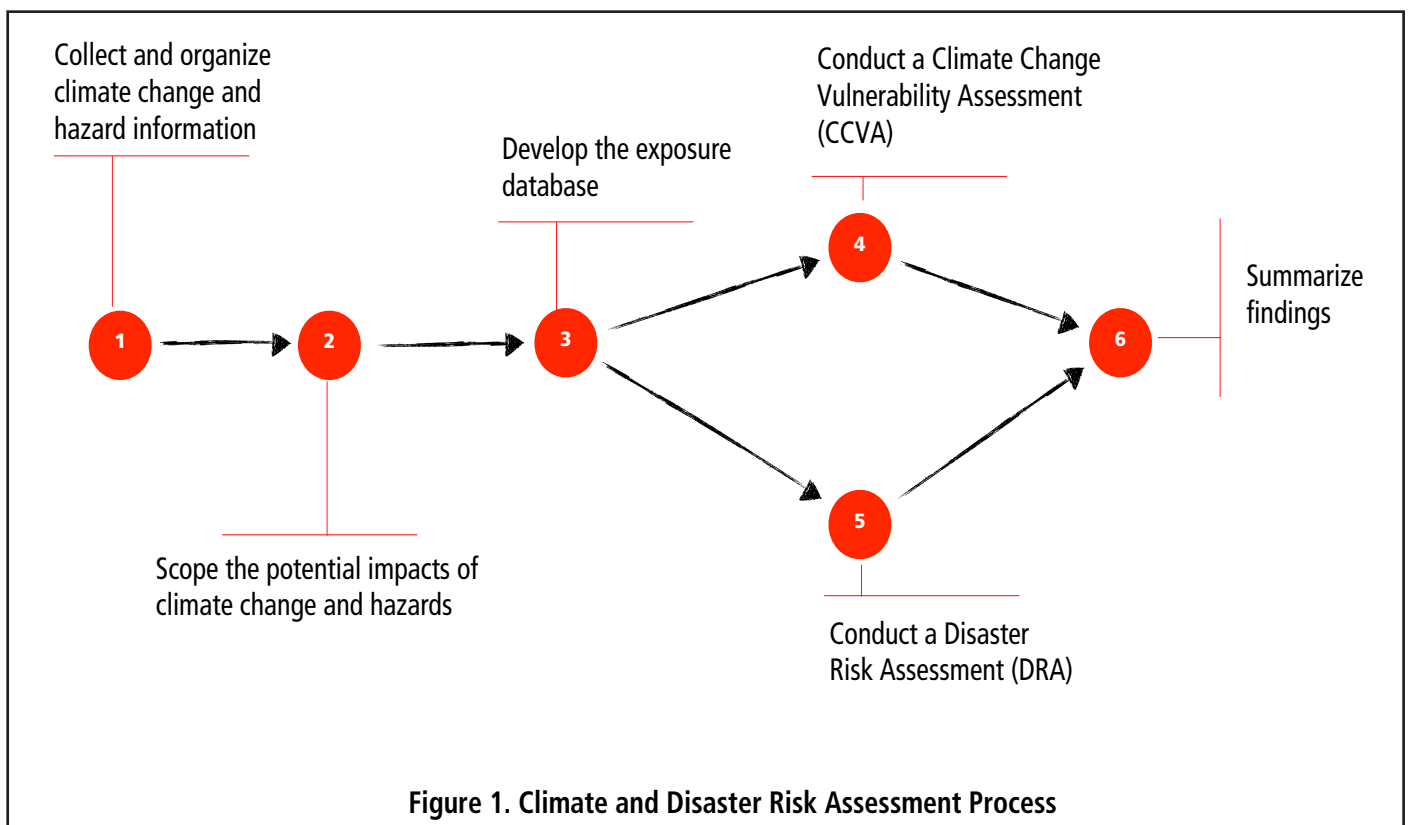


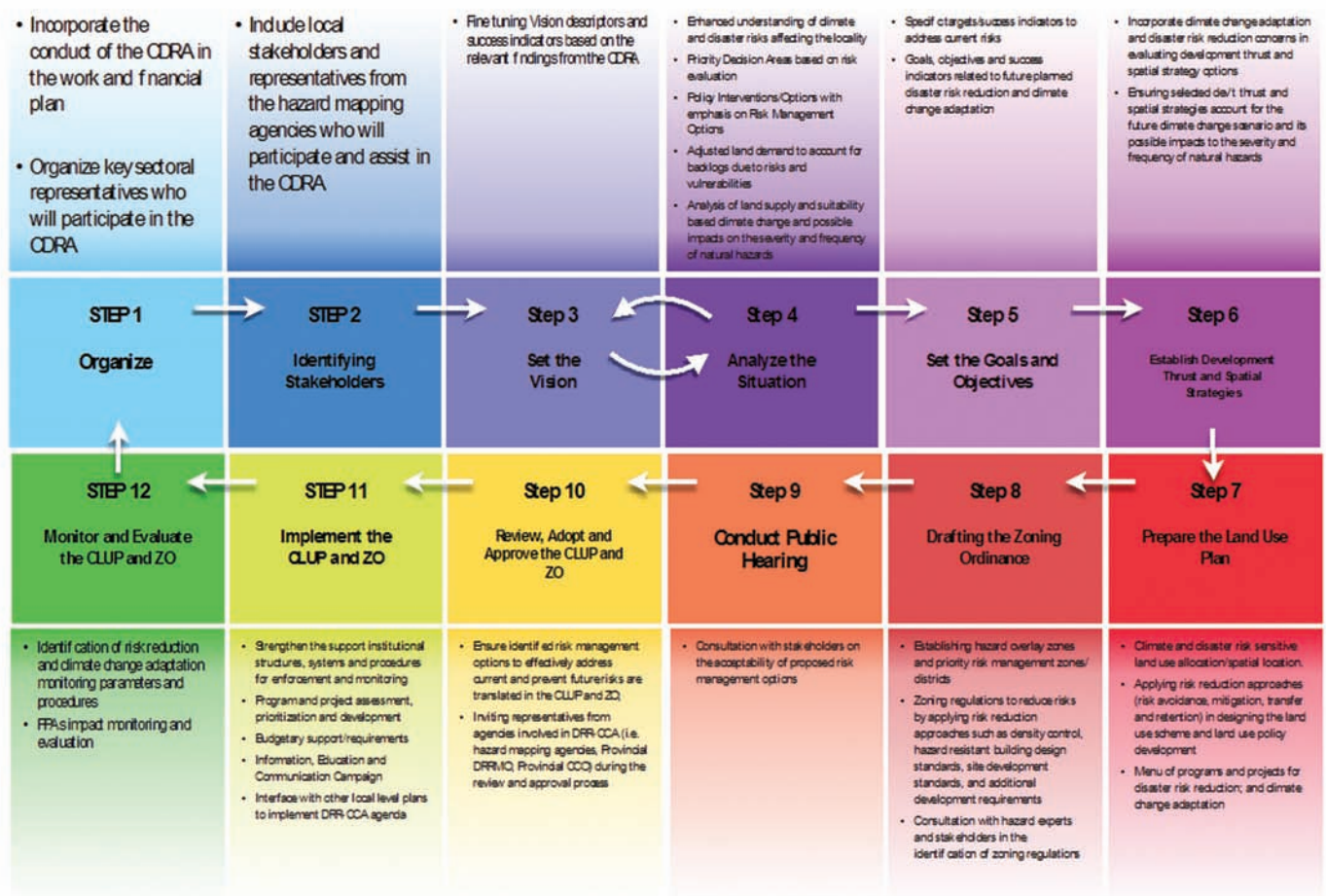
Figure 1. Climate and Disaster Risk Assessment Process

## **Integrating CDRA in the Comprehensive Land Use Plan**

The CDRA generates risk and vulnerability information to enhance the CLUP analytical foundation by ensuring that the challenges posed by disasters and climate change become part of the basis of the CLUP and that these would lead to the identification, financing, and implementation of disaster risk reduction and climate change adaptation measures. The emphases of mainstreaming are on:

1. Incorporating results of the CDRA in the analysis of the various development planning sectors, thus allowing the identification of development challenges, issues, concerns, implications, and policy interventions related to disaster risk reduction and climate change adaptation and at the same time helping build the case for other sectoral concerns;
2. Allowing adjustments on the projected land requirements of basic services such as school buildings, housing, health care centers, local roads, given current levels of risks and vulnerabilities;
3. Analyzing suitability of land supply by considering the potential impacts of climate change and natural hazards to ensure that future settlement areas are located in safe areas or in areas where risks and vulnerabilities can be managed given current and future capacities;
4. Identifying spatial development goals and objectives with emphasis on addressing current risks and vulnerabilities and ensuring long term and sustained sectoral and spatial development in view of climate change and natural hazards;
5. Evaluating and selecting development thrust and spatial strategy given the future scenario of climate change and hazards;
6. Incorporating the general concepts of risk reduction (i.e. risk reduction through risk avoidance, risk mitigation, risk transfer, and risk retention), and policies for effective climate change adaptation in land use decision mapping and policy formulation;
7. Recommending zoning regulations within hazard-prone areas, with emphasis on provisions on building design and site development regulations, regulations and arrangements within identified Areas for Priority Action (APAs), and other cross-cutting regulations related to climate change adaptation;
8. Identifying vulnerability and adaptation programs and projects to improve the capacities and capabilities of local government units in the implementation of sustainable DRR-/CCA-related land use planning;
9. Identifying planning indicators for the monitoring and evaluation of the effects of disaster risk reduction and climate change adaptation interventions implemented during the planning period.

**Figure 2. Mainstreaming climate and disaster risks, entry points to the CLUP formulation**



## Contents and Organization of the CLUP Guidebook

**Chapter 1. Introduction** This chapter provides the rationale for mainstreaming Climate and Disaster Risks in Comprehensive Land Use Planning. It argues the benefits of a risk-sensitive CLUP as an instrument in promoting sustainable development through the integration of climate and disaster risk reduction and climate change adaptation in all aspects of the CLUP formulation process. It discusses the enabling environment for mainstreaming DRR-CCA in local planning; the importance of the linkages of CLUP with provincial development and physical framework plans as well as with the comprehensive development plan; and the application of the ecosystem-based approach in promoting inter-LGU synergy and convergence in addressing climate and disaster risks.

**Chapter 2. Fundamental Concepts** The fundamental concepts of risk and vulnerability based on the frameworks of the Intergovernmental Panel on Climate Change (IPCC) on vulnerability and the United Nations (UN) on risk, and these frameworks' similarities and differences in the context of disaster risk reduction and climate change adaptation are discussed in this chapter. The important terminologies are discussed here to pave the way for a deeper understanding of disaster risk and climate change vulnerability assessments



**Chapter 3. Mainstreaming Framework** Two major components of the mainstreaming framework—the climate and disaster risk assessment and the integration of results into the CLUP, are presented in this chapter. The theoretical aspects are discussed to gain a better understanding on the how to's of the six-step climate and disaster risk assessment process and to identify the entry points for mainstreaming assessment results in the 12-step CLUP preparation process, specifically, in the visioning, goal and objective setting, development thrust and spatial strategy formulation, land use mapping, policy development, and zoning.

**Chapter 4. Climate and Disaster Risk Assessment** This chapter operationalizes the mainstreaming framework by demonstrating how each process is done using the pilot testing results of the CDRA approach in the Municipality of Opol. It outlines the procedures for: gathering climate and hazard information; scoping of impacts of climate change and hazards on areas, sectors or human and natural systems; enumerating various indicators for establishing exposure, sensitivity/vulnerability, and adaptive capacity for population, urban use areas, natural-resource-based production areas, and critical point and lifeline facilities; assessing and mapping vulnerability and risks; establishing priority decision areas; identifying sectoral development issues and concerns in terms of climate change and natural hazards; and enumerating policy options/interventions with emphasis on the identification of risk management options.

**Chapter 5. Formulating a Climate and Disaster Risk-Sensitive Land Use Plan** The results of the CDRA and how these will be used in the “business-as-usual” CLUP shall be demonstrated in this chapter. Analytical results of the CDRA are used in risk-sensitive development thrust and spatial strategy evaluation and selection, land use policy formulation, zoning regulations, program and project identification, and monitoring and evaluation.

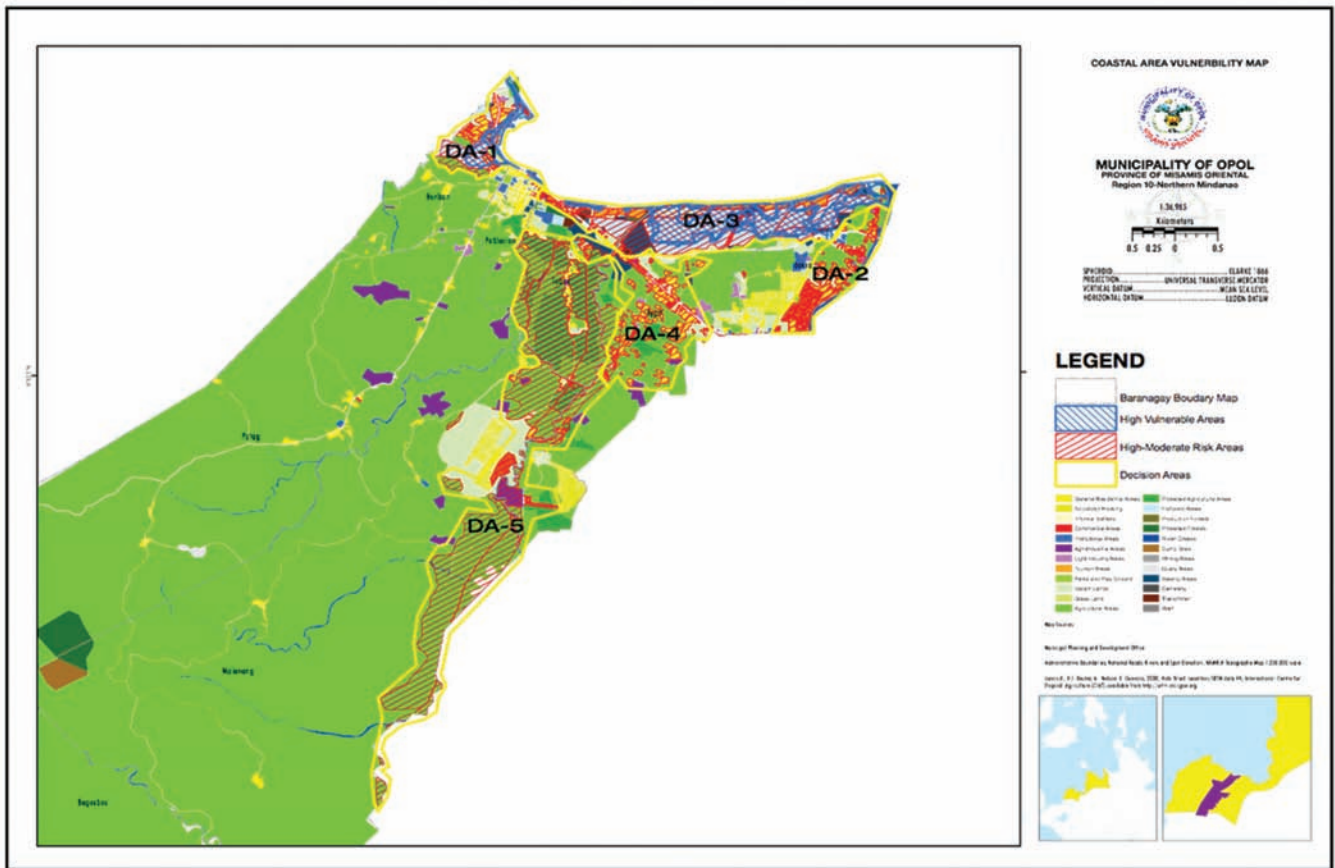
## **Climate and Disaster Risk Assessment for Municipality of Opol, Misamis Oriental**

Opol Municipality in Misamis Oriental is susceptible to hydrometeorological hazards such as flooding and storm surge. These hazards are projected to be more frequent and intense with climate change. Climate change projections done by PAGASA in the area suggest growing threat from extreme rainfall events, changes in seasonal rainfall patterns, and more dryer and warmer days. Storm surges are projected to result in intensified flooding in areas, both coastal and inland.

The combined assessments on disaster risk and climate change vulnerability done in the municipality revealed priority decision areas which shall be the focus of land use and sectoral planning and analysis. This combined analysis of disaster risks influenced by past knowledge on hazard events and the potential impacts of climate change is a no-regrets, integrated approach to disaster risk reduction and climate change adaptation.

Figure 1 below shows the five decision areas in Opol which have been sieved from the analysis of the geographic extent of flood and the exposed population, structures, and economic activities; as well as from the assessment of vulnerability to climate change. The implications to development and appropriate policy and risk reduction and adaptation measures were identified from the assessment.

**Figure 3. Identified decision areas based on the combined disaster risk and climate change vulnerability assessments**



As an example of the analysis, the Bonbon-Luyong, Bonbon Poblacion Coastal Area (DA1) is considered highly at risk to flooding due to the poor quality of structures along the coast while the fishpond areas are moderately at risk given their location and design. Transport or circulation systems are lowly at risk but may likely experience disruption in mobility in the event of floods. Some portions of the Bonbon and Poblacion areas are projected to be permanently inundated due to changes in sea levels. Most of the structures in the area are not designed to withstand coastal flooding and storm surge. A significant portion of the low-income population relies on tourism for their means of livelihood, which is expected to be disrupted by coastal flooding. If left as it is, damage to structures and possible deaths and injuries may be expected during floods. One key measure that has to be implemented is the strict implementation of easement standards coupled with alternative climate-resilient livelihood and safe relocation areas.

Considering together all the five priority decision areas identified from the disaster risk and climate change vulnerability assessments, the land use plan shall address the challenges of expanding its settlement to higher grounds, developing its coastal and crop production areas, and achieving water sufficiency.

Mitigating measures such as medium-to-high density settlements in high-risk areas will require substantial amount of investments and constrained by the low adaptive capacity of informal settlers. Higher grounds will be the choice as settlement expansion areas.

Apart from addressing coastal flooding, finding solutions to securing safe water supply needs priority attention given the adverse impact from saltwater intrusion. Mangrove reforestation is also an important adaptation measure to sustain the fishing industry along the coasts and at the same time to serve as protection from coastal floods.

Certain crop production areas are at risk to flooding and vulnerable to the reduced seasonal rainfall, increased number of dry days, and extreme temperature events, which potentially affect productivity. Thus, risk management options encompass disaster risk reduction and climate change adaptation measures such as irrigation facilities, climate smart production techniques, and crop insurance.

Achieving water sufficiency is a key element of the municipality's vision considering that its major source of potable water is Cagayan de Oro. Coastal communities rely from ground water resources and upland communities from nearby springs. Local water supply is further threatened by saltwater intrusion from coastal flooding and the projected reduction in seasonal rainfall and increase in temperature. The adaptation measures include identification and development of feasible local potable water point sources, setting up of a local water district, establishment of water treatment and recycling facilities, and designing of a rainwater harvesting/storage systems to augment the existing and future water supplies.



Recognizing the need to further enhance the capacities and empower local governments units on addressing climate change and disasters through local development planning, the Housing and Land Use Regulatory Board (HLURB), with technical assistance from the Climate Change Commission, United Nations Development Program (UNDP) and the Australian government, has formulated the Supplemental Guidelines on Mainstreaming Climate and Disaster Risks in the Comprehensive Land Use Plan as an instrument to improve local land use planning and regulatory processes. This initiative is being undertaken under the project—Enabling the Cities of Cagayan de Oro and Iligan and the Provinces of Compostela Valley and Davao Oriental to Cope with Climate Change or Project Climate Twin Phoenix.

The supplemental guidelines support the national strategic priority on mainstreaming disaster risk reduction and climate change adaptation in the development processes with emphasis on the formulation of climate- and risk-sensitive Comprehensive Land Use Plan (CLUP) and Zoning Ordinance (ZO). It is a product of consultations with land use planning practitioners from the various HLURB national and regional offices. It also supplements the initiative of the HLURB in formulating the enhanced CLUP guidebooks covering other thematic planning areas which include biodiversity, coastal and marine zones forest land use, and DRR-CCA concerns in the CLUP formulation process. It builds on the draft Reference Manual on Integrating Disaster Risk Reduction and Climate Change Adaptation prepared under the NEDA-UNDP-AusAid Integrating DRR and CCA project.



**CLIMATE CHANGE COMMISSION**  
**ADDRESS: ROOM 238 MABINI HALL, MALACAÑANG COMPOUND,**  
**SAN MIGUEL, MANILA, PHILIPPINES**  
**(632) 735-3144**  
**INFO@CLIMATE.GOV.PH**