

**INTEGRATING ENVIRONMENTAL IMPACT ASSESSMENT IN LAND USE
PLANNING TOWARDS CLIMATE ADAPTIVE RESIDENTIAL DEVELOPMENT:
THE CASE OF BAGUIO CITY AND STA. ROSA CITY, PHILIPPINES**

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Technische Universität Dortmund

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by

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Declarations

According to the internal guidelines for implementing the PhD regulation of the Faculty of Spatial Planning (§ 9 PromO):

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Disclaimer

This document presents work undertaken as part of a programme of study at the School of Spatial Planning, Technische Universität Dortmund. The views and opinions expressed herein remain the sole responsibility of the author, and do not necessarily represent those of the University.

All works taken from other authors are duly acknowledged;
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Preface

Of several environmental policies and systems in place that are attuned to the global call of sustainable and adaptive development in the midst of climate change, how much of these Philippine government initiatives—operating independently of one another—has really been effective and efficient in addressing the predicaments of particular localities directly and adversely prone to climate calamities. Such is the case of the Environmental Impact Assessment (EIA) and Land Use Planning (LUP) as practiced in the Philippines. The author posits the need to integrate these two systems to be more responsive to climate-adaptive resilient and inclusive development, specifically urban residential development. Hence, the conduct of these case studies—two urban residential communities in two Philippine cities prone to flooding and landslides—is pursued.

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This achievement is dedicated to my beloved **Mommy and Daddy**, whose endless love, unwavering belief in me, and sacrifices continue to be the bedrock of all my aspirations.

And to the **resilient people of the Philippines**, whose indomitable spirit, communal solidarity, and perseverance —especially in the face of environmental adversity—have always been a profound source of inspiration to me. Their inherent strength, while admirable, calls not for endless endurance, but for a future grounded in security and equity. This work is a humble yet resolute contribution toward building the robust and sustainable future their unwavering spirit rightfully deserves.

Abstract

The Philippines has been engaging in environmental initiatives since 1976 with Republic Act 3931 (Pollution Control Law). Two years after, the Environment Impact Assessment (EIA) system (Presidential Decree 1586) was initiated and has evolved as a separate system and operates separately from the Land Use Plan (LUP), which is directly involved in policy-making at the municipal level. In climate-adaptive residential development plans in urban communities, the implementation of the EIA and land use planning systems at the municipal level is deemed very crucial.

This dissertation that focused on two case studies of residential communities brings into light the Philippines' experience in implementing the EIA and LUP in view of climate-adaptive residential development. These case studies include two residential communities, each from two cities, Baguio and Sta. Rosa, that experienced climate-related disasters such as floods and landslides. The residential development plans for the two communities are subject to the EIA process, and both have approved Comprehensive Land Use Plans (CLUP) with corresponding Zoning Ordinances.

Baguio City is located in a seismically active mountainous region with stripped-off vegetation. With frequent periods of intense rainfall and rapid development, the city of Baguio has all the ingredients for a landslide-prone terrain. On the other hand, Sta. Rosa City is highly susceptible to earthquake and flooding, being situated where the West Marikina Valley Fault traverses, with floodplains sprawling a total area of 302 hectares. Drawing from vast secondary data and information, key informant interviews, and a survey (quota sampling) from both residential communities of the two cities, the findings expose the need to integrate the EIA in the land use planning system, particularly in the climate-adaptive residential development plan at the municipal level.

Overall, this dissertation presented eight concluding points. Both the EIA and LUP fully acknowledge the relevance of climate change in land use and development in light of recent climate-related hazards/disasters. However, surveys and interviews were found to demonstrate ineffective planning, both at the community and project level/scales. The EIA and LUP are presently fragmented systems pursued independently of each other due to fragmented policies and processes and inadequate databases to estimate climate impacts on development. Nevertheless, the EIA and LUP are potential planning tools to mitigate the impacts of climate change on land resource use and development.

In comparison, the EIA is a more rational system than LUP but limited in scope. Though the LUP is more flexible than the EIA, it negates the establishment of a robust database and methodology for EIA. The EIA and LUP consultations can be redefined for strategic actions for risk-prone communities to mitigate impacts. All system components of EIA and LUP present opportunities for integration. Disaster management policies should also be integrated into EIA and LUP. The EIA integration in LUP is possible at the local level, but a truly comprehensive integration that formalizes strategic environmental assessment principles will require targeted amendments to existing national legislation and policies. This can be mainstreamed throughout the LUP formulation process focusing on key result areas: planning parameters, intent to act or policy prescriptions accompanied by spatial targets, and adaptation actions for risk-prone urban settlements. Therefore, considering these points, policy, and institutional reforms with a view of retrofitting the planning process are recommended.

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List of Acronyms

AO	Administrative Order
CALABARZON	Cavite, Laguna, Batangas, Rizal and Quezon
CAR	Cordillera Administrative Region
CBAO	City Buildings and Architecture Office
CDP	Comprehensive Development Plan
CLUP	Comprehensive Land Use Plan(ning)
CNC	Certificate of Non-Coverage
CPDO	City Planning and Development Office
DAO	Department Administrative Order
DENR	Department of Environment and Natural Resources
DMC	Department Memorandum Circular
ECA	Environmentally Critical Area
ECC	Environmental Compliance Certificate
ECP	Environmentally Critical Project
EGGAR	Engineering Geology and Geohazard Assessment Report
EIA	Environmental Impact Assessment
EIAMD	Environmental Impact Assessment and Management Division
EIARC	Environmental Impact Assessment Review Council
EIS	Environmental Impact Statement
EMB	Environmental Management Bureau
ENR	Environmental and Natural Resources
EO	Executive Order
FLUP	Forest Land Use Plan
GA	Government Agency
GHG	Greenhouse Gas
HLURB	Housing and Land Use Regulatory Board
HUC	Highly Urbanized City
IAIA	International Association for Impact Assessment
IEE	Initial Environmental Examination
IEMSD	Integrated Environmental Management for Sustainable Development
IPCC	Intergovernmental Panel on Climate Change
IP	Indigenous People
IPRA	Indigenous People's Rights Act
IRR	Implementing Rules and Regulations
LDC	Local Development Council
LDIP	Local Development Investment Program
LGC	Local Government Code
LGU	Local Government Unit
LUP	Land Use Planning
MC	Memorandum Circular
NECA	Non-Environmentally Critical Area
NEDA	National Economic and Development Authority
NEPA	National Environmental Policy Act

NEPC	National Environmental Protection Council
NFPP	National Framework for Physical Planning
NGO	Non-Government Organization
NIPAS	National Integrated Protected Area System
PA 21	Philippine Agenda 21
PCSD	Philippine Council for Sustainable Development
PD	Presidential Decree
PDIP	Provincial Development Investment Program
PDPFP	Provincial Development and Physical Framework Plan
PEIS	Philippine Environmental Impact Statement
PEISS	Philippine Environmental Impact Statement System
PLUC	Provincial Land Use Committee
PO	People's Organization
PPA	Programs, Projects and Activities
PPP	Policies, Plans and Programs
PSA	Philippine Statistics Authority
RA	Republic Act
RED	Regional Executive Director
RLUC	Regional Land Use Committee
RPFPP	Regional Physical Framework Plan
RPM	Revised Procedural Manual
RPS	Rationalized (Local) Planning System
SAR	Special Administrative Region
SDG	Sustainable Development Goal
SEA	Strategic Environmental Assessment
TOR	Terms of Reference
TEZ	Tourism Economic Zone
UDHA	Urban Development Housing Act
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
UNWCED	UN World Commission on Environment and Development
ZO	Zoning Ordinance

Chapter 1: Introduction

Through three decades of direct involvement in both Environmental Impact Assessment (EIA) and comprehensive land use planning (CLUP) in the Philippines, it has been at the core of the author to crystallize pertinent issues between these two decision-making tools. These issues warrant some changes or refinements necessary to further aid the concerned decision-makers in managing, if not reducing, natural disasters with a view of formulating a risk-sensitive plan and creating climate change adaptive and resilient communities. With the additional requirement in the EIA such as the Engineering Geological and Geohazard Assessment Report (EGGAR)¹ as the government's response to a catastrophic landslide over a subdivision during a typhoon, the author is all the more resolved to address crucial issues between the implementation of EIA and land use planning in the country.

1.1 Background

The Philippine state has declared in Republic Act 9729 (The Climate Change Act of 2009) its intention to mainstream climate change into government policy formulations and establish the framework strategy and program on climate change. This is also in view of the world's apprehensiveness of the future in terms of climate change.

The Philippines contributes less to the causes of climate change but is one of the countries with the highest climate risk index.

Although the country has less contribution to the causes of climate change, ironically, it has been more vulnerable to its adverse effects, similar to other countries. In terms of the Global Climate Risk Index, countries like the Philippines and Pakistan that are recurrently affected by catastrophes continuously rank among the most affected countries in the long term and for the last six years (Kreft et al., 2017).

This study also dwells on the action agenda of Agenda 21, specifically, which concerns investments in human and social capital, population management, and human settlements, among others.

RA 9729 also adopted the framework of The Philippine Agenda (PA) 21 (1996), which defines sustainable development as “the harmonious integration of a sound and viable economy, responsible governance, social cohesion, and ecological integrity, to ensure that development is a life-sustaining process.”

¹ Created through DENR A.O. 2000-28 which requires all proponents of subdivision development projects, housing projects and other land development and infrastructure projects, private or public, to undertake an Engineering Geological and Geohazard Assessment

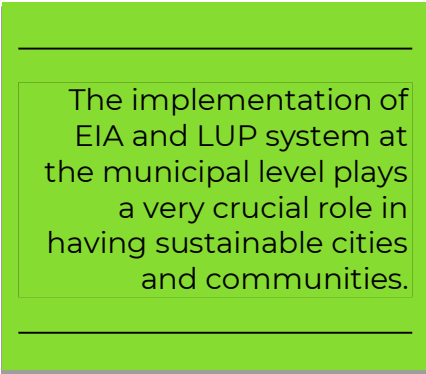
Sustainable development², by definition of the 1987 Report of the World Commission on Environment and Development, means meeting the needs of the present without compromising the ability of future generations to achieve their needs and aspirations (UNWCED, 1987). This is the springboard of many countries to craft their own definition of sustainable development through national policies. In some countries and international organizations, the definition is broad— incorporating biophysical and socio-cultural dimensions, including health. In other jurisdictions, the definition is more restricted, with the emphasis on the biophysical aspects. In general, however, all imply integrating economic, social, and environmental considerations with mutually attainable goals to guide future development.

One way of making sustainable development policy operational is by establishing assessment, planning, and implementation methods that integrate environmental sustainability considerations. Translating sustainable development policy into a program of action would facilitate its realization on the ground. Integrating environmental considerations in the operationalization of sustainable development would ensure the long-term viability of socio-economic development programs. Environmental sustainability integration would involve processes that combine ecologically-based planning and resource and environmental management to ensure the systematic appraisal, adoption, and implementation of socio-economic development projects.

The Philippines, being bound by its adherence to climate change initiatives, made sure that sustainable development goals are anchored to the country's commitment to mitigate and adapt to the continuing impact of climate change.

The United Nations Development Programme (UNDP) generally views sustainable cities and communities (SDG 11) as places with "access to safe and affordable housing" coupled with improved "urban planning and management...that is both participatory and inclusive."³

To convey these grand goals into practice, specifically in climate-adaptive residential development plans in urban communities, the implementation of the EIA and land use planning system at the municipal level is very crucial.



The implementation of EIA and LUP system at the municipal level plays a very crucial role in having sustainable cities and communities.

There are also other tools for development decision-making, such as risk assessment and strategic environmental assessment (SEA). As generally understood, SEA is a systematic and anticipatory process undertaken to analyze the environmental effects of proposed plans, programs, and other strategic actions and to integrate the findings into decision-making. The purpose of SEA, broadly stated, is to ensure that environmental considerations inform and are

² Sustainable Development from the UNEP

³ <http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-11-sustainable-cities-and-communities/>

integrated into strategic decision-making in support of environmentally sound and sustainable development (UNECE, 2006). Neither of the risk assessment and SEA has the legal or mandatory status of EIA or is not yet at the cutting edge of addressing sustainability issues (IAIA, 2002). This reflects the institutional context of the Philippines, where EIA is a nationally established and operationalized mechanism under the Environmental Impact Statement (EIS) system, administered by the DENR and directly linked to land development approvals. In contrast, SEA is neither legally mandated nor systematically integrated into local planning processes. While recognizing SEA's potential for broader strategic environmental integration and its theoretical advantages, this study's focus is guided by the current regulatory landscape. Nevertheless, it is widely accepted that SEA is much more likely to promote sustainable development than project-level EIA. This is because most strategic decisions have already been taken once a proponent begins articulating the needs of a specific project. By contrast, alternative options are still under debate when policies, plans, and programs are discussed. By incorporating sustainable development considerations early in the decision-making process, there is a good chance that the subsequent design of individual projects will be more environmentally acceptable and that the project-specific EIA process will be more focused and efficient (Weaver, 2003). This study therefore considers EIA not as a substitute for SEA, but as a pragmatic entry point to enhance the environmental responsiveness of land use planning within current governance and regulatory frameworks.

By far and large, the requirement of EIA with respect to development projects and the procedures to be followed for such assessments is the most pervasive environmental measure. It has long been entrenched in law than any other environmental policy, and its results are publicly acknowledged and documented. It seeks to avoid or reduce the environmental damage that comes with development initiatives and ensure that the benefits promised are sustainable and well within the carrying capacity of the environment. It is an anticipatory, participatory, integrative management tool, which has the ultimate objective of providing decision-makers with an indication of the likely consequences of their decisions relating to new projects or new programs, plans, or policies (Wood, 1995). However, decision-making takes place in a political context. Factors other than environmental ones need to be accounted for, and in many cases, economic, social, and political factors far outweigh the environmental factors. By this, EIA becomes a central element in any development planning process, which does not stray from its original intent some four decades ago.

When EIA was first developed in 1970 by the United States Government under the National Environmental Policy Act (NEPA), its primary intent was to heighten environmental considerations in public decision-making, hailing a new concept of planning and management (NEPA, 1993). The passage was a response to the host of notable excess road projects, flood control systems, and water reservoirs. To curb this public policy practice and respond to the clamor to manage the environmental effects of this infrastructure boom, the Environmental Impact Statement (EIS) system, now popularly known as EIA, was used to improve the federal planning process forcing early consideration of environmental values. However, decades after its enforcement, the EIA has failed to improve planning mainly because the EIA process did

not mesh with a rational, comprehensive planning and design process that compared various solutions based on a set of criteria. At the minimum, any project identified through this process must be economically achievable, technically sound, socially acceptable, and ecologically desirable. The EIA, on the other hand, only addressed one or two of these criteria in detail.

Today, countries that have developed their own EIA encounter similar flaws to integrate the EIA into public decision-making are gaining ground. In the Philippines, sustainable development translates to the “harmonious integration of a sound and viable economy, responsible governance, social cohesion/ harmony, and ecological integrity to ensure that development is a life-enhancing process” (PA 21). It underscores that socio-economic and environmental concerns must be addressed simultaneously in the planning or decision-making process instead of the conventional single-sector planning approach. For instance, policies that conserve the quality of agricultural land and protection forests improve the long-term prospects for agricultural development. Efficiency in utilizing energy and raw materials in industrial processes reduces wastes and can reduce costs (PCSD, 2004). However, merging environmental and socio-economic considerations in decision-making involves a fundamental realignment of the overall objectives of development planning in the light of a new awareness of the environmental implications of development activities. This means that the process of development should be viewed from the outset as a multipurpose undertaking that includes an explicit and defined concern for the quality of the environment. Within such a planning context, analysis and evaluation must stress the key role that environmental quality can play in sustainable development and that the results of these processes mutually reinforce each other.

To effectively implement this desired shift in the decision-making approach, the refinement of analytical tools and methodologies is critical. For instance, to accommodate the social and environmental consequences of the misuse of the nation's natural capital in economic calculations, such tools as Environmental Impact Assessment and Land Use Planning must be appropriately installed and strengthened and should work in complementation.

However, EIA has yet to be clearly linked to land use planning at the municipal level.

In relation to the other instruments to achieve the envisioned sustainable development, EIA has yet to be clearly linked to broader policy-making systems, specifically the land use planning at the local government level where both systems are carried out. Land use planning is the primary tool for incorporating environmental considerations in the formal process of decision-making/policy-making. However, the detailed process by which it is carried out is not legislated, unlike the EIA. It is broadly characterized in RA 7160 (Local Government Code of 1991) as a continuous policy formulation and implementation process that emphasizes the importance of continuous improvement of policies for environmentally sustainable and socially equitable growth. Specific operational prescriptions are provided by — as to membership, the time frame and national directions.

In principle, land use planning should include (a) prioritization of environmental issues in terms of their effect on economic development and poverty reduction, using both quantitative and qualitative techniques; (b) mechanisms that bring together different viewpoints during policy formulation and implementation processes; and (c) mechanisms to ensure social accountability and allow social learning to take place. However, land use planning is essentially the local government's ball game, and decisions arising from local government-specific needs hardly link the EIA system nor consider the results projects previously subjected to EIA.

1.2 Rationale of the Study

As the Inter-agency Panel on Climate Change (IPCC) conducts periodic assessments on the reservoir of knowledge on climate change and updating standard references for all government and private entities, there is also a parallel need to look into the Philippine experiences in living out its intention to comply with climate change initiatives particularly concerning the implementation of Environmental Impact Assessment vis-à-vis land use planning at the municipal level.

As seen from the above discussions, some observations are noteworthy to point out:

First, the refinement of analytical tools and methodologies is critical. For instance, to accommodate the social and environmental consequences of the misuse of the nation's natural capital in economic calculations, such tools as EIA and LUP must be appropriately installed and strengthened and should work in complementation.

Second, EIA has yet to be clearly linked to broader policy-making systems, specifically the land use planning at the local government level where both systems are carried out. The LUP is the primary tool for incorporating environmental considerations in the formal process of decision-making/ policy-making. However, the detailed process by which it is carried out is not legislated, unlike the EIA.

Third, the LUP is essentially the local government's ball game. Decisions arising from local government-specific needs hardly link the EIA system nor consider the results of projects previously subjected to EIA.

It is against this backdrop of identified gaps in institutional systems and planning practices that the urgency for review becomes paramount. The escalating damages in human settlements from successive climate-related disasters have underscored the critical need for more effective climate change adaptation strategies, prompting various sectors to call for a thorough re-evaluation of existing frameworks.

The LUP is primarily a broad-based long-term planning tool but implemented mainly through zoning regulations and direct public investments. The Philippine EIA and LUP systems operate independently despite assertions that socio-economic and environmental concerns are

“integrated into decision-making processes.” Both systems claim concern for the quality of the environment given its vulnerability to climatic changes. In the planning context, evaluation and policy development on environmental quality is critical to mitigating the effects of development projects on climate change while increasing adaptation with climate change impacts.

Given the Philippine context, where EIA is a legally mandated and widely implemented tool for project-level environmental review directly influencing land development approvals, this study specifically focuses on EIA. While SEA offers a broader, more strategic approach to environmental integration in planning, its lack of legal mandate and systematic integration into local planning processes in the Philippines necessitates a pragmatic approach. This research, therefore, prioritizes examining the existing and operational EIA system as a crucial and accessible entry point for enhancing environmental responsiveness within current land use planning frameworks, aiming to identify actionable improvements within the prevailing regulatory landscape.

1.3 Statement of the Research Problem

This study examined the Philippines' experience in implementing EIA and LUP in light of climate-adaptive residential development in urban communities taking Baguio City and Sta. Rosa City as case studies. The following queries were addressed:

1. What is the relationship between EIA and Land Use Planning System?
 - a) What are the similarities, differences, and possible linkages between the Environmental Impact Assessment and Land Use Planning System in the Philippines in terms of policy, scope of application, process, institutional arrangements, and outputs?
 - b) How is EIA related to Land Use Planning System?
2. What are the possible areas for integration?
 - a) What components of EIA can be integrated into the Philippine land use planning system to aid the decision-making towards climate change mitigation and adaptation?
 - b) What are the preconditions for this integration?
3. How did the EIA and LUP guide residential development, in the purview of climate adaptability, in the cities of Baguio and Sta. Rosa?

1.4 Objectives of the Study

The principal research questions brought forth the main objective of this dissertation, i.e., to examine how the EIA system in the Philippines relates to land use planning at the local government level.

Primarily, this study, in principle, provides a comparative review of the Environmental Impact Assessment and land use planning system of the Philippines.

Specifically, the study aims to:

- a. Provide a comparative review of EIA and Land Use Planning system in the Philippines;
- b. Establish the extent of relationship of the EIA to the decision-making process applied in land use planning in terms of policies, the scope of application, processes, institutional arrangements, and outputs;
- c. Ascertain the important components of EIA that facilitate or hinder the formulation of land use decisions, particularly those impacting climate-adaptive/risk-sensitive residential development in two cities; and,
- d. Provide recommendations in line with climate change adaptation goals to integrate the EIA system as a support mechanism into the land use planning system.

1.5 Assumptions of the Study

Following Riki Therivel's premise that EIA is a fundamental consideration to formulating strategic environmental policies such as a local land use plan towards climate risk-adaptation in settlement areas, and the reported limitations of EIA, this researcher argues that:

1. The Philippine EIA system can influence land use planning decisions to cause risk-sensitive residential development.
2. There are components of EIA that can be integrated into the land use planning system to allow for strategic environmental assessment.
3. There are components of the EIA or the LUP that hinder or facilitate the land use decision-making process in terms of prioritization of development needs, land use allocation, and zoning principles.

1.6 Scope and Limitations of the Study

Several limitations pertain to this study:

Firstly, the study focused only on two specific hazards: flooding in Sta. Rosa City and landslides in Baguio City.

Secondly, the assessment of EIA is limited to residential development projects that have been issued Environmental Compliance Certificates (ECCs).

Thirdly, the assessment of EIA focused only on the components over which the local government exercises a degree of control and those that affect the land use planning system. It covered residential development, which included mitigation activities and concerns, but excluded other geohazards such as earthquakes.

Only the key considerations and processes applied by the stakeholders that lead to land use policies and zoning ordinances were considered for assessment. All other land development controls outside established land use planning practices such as the national building code and real property tax system were excluded.

1.7 Significance of the Study

There have been several reviews made on the EIA system. The conception of environmental awareness started in 1977 with the promulgation of Presidential Decree (PD) 1151 or the Environment Code. In 1978, this was followed by PD 1586 initiating the Philippine Environmental Impact Statement System (PEISS). A series of PDs and DAOs were issued thereafter to update the EIA (DAO 300 in 1996; a revision on DAO 5 in 2000; DAO 30, which introduced the process and method for EIA in 2003; and DAO 8 issued in 2008, which streamlined the requirements). Also, in 2007, an EIA Review Manual was adopted to address "vague provisions ..., define and delineate clearly responsibilities and scope of authority" (EMB Memorandum Circular No. 001). However, the focus has been chiefly on the requirements and operations of the EIA process – mainly its procedural effectiveness.

With this research, the effectiveness of EIA and LUP was examined in the context of public policymaking with regard to achieving climate-adaptive residential development. The information and insights derived from the analysis of selected components of both systems were able to single out the areas of improvement to benefit local government units, particularly the climate change adaptation policy.

Contribution to Regional Development Planning

Exploring the salient features of two interlinked systems such as EIA and land use surfaced some policy-based issues on EIA application in the Philippines as a decision-support mechanism to land use planning. The results are hoped to be used to reconfigure land use

planning practices and contribute to current efforts to amend the existing policies on EIA and the legislation of land use planning system.

A paradigm is being proposed for integrating both processes at the local government level that could pave the way for harmonizing both processes toward achieving sustainable development through climate-adaptive residential development projects.

Chapter 2: Review of Related Literature

2.1 EIA and SEA in East and Southeast Asia

Since the 1970s, East and Southeast Asia have experienced unprecedented levels of economic growth, exposing it to a wide range of development opportunities and challenges. The environmental challenges include the toll on natural resources and the degradation of environmental quality in many regions and cities that threaten people's health and the quality of life, reduce economic productivity, and compromise sustained economic growth and poverty reduction.

Mainstreaming these issues into the development project level starts with the Environmental Impact Assessment. This approach was established in the region and has been in use since the early 1980s. It has contributed to pollution prevention and control in numerous projects that have adverse impacts on the environment. Nonetheless, there was still room for improvement in strengthening the legal systems, the timing of the study, public participation, and information disclosure. EIA was developed in the 1970s as a tool to assess and reduce adverse impacts on the environment caused by projects. The EIA was therefore referred to as project-based and was geared towards 'pollution control or prevention.' Substantial experiences with EIA and its applications have been accumulated, including procedure, methodology, and guidelines.

Nevertheless, the limitation in scope and function of the EIA system has resulted in difficulties in meeting new challenges, and many issues can only be addressed at the policy and strategic level. Thus, the development of SEA systems in the middle to the late 1980s to a large extent was forwarded to address the deficiencies of EIA. The SEA was geared towards upstream issues and was aimed at sustainability and cumulative and indirectly induced environmental effects. It focused on Policies, Plans, and Programs (PPPs) while EIA centered on projects. The SEA is a systematic process for evaluating the environmental consequences of a proposed policy, plan, or program initiative to ensure that they were fully included and appropriately addressed at the earliest appropriate stage of decision-making on par with economic and social considerations. It was an analytical and participatory approach for mainstreaming and upstreaming environmental and social issues into decision-making and implementation processes at the strategic level (Sadler, 1996).

A critical distinction, therefore, lies in understanding these operational levels: SEA is designed for PPPs at an upstream, proactive stage, while EIA focuses on individual projects at a downstream, reactive stage. This conceptual clarity is essential for comprehensive environmental governance, emphasizing the need to integrate environmental considerations strategically at the planning frontier and reactively during project implementation. Table 1 summarizes the general differences between SEA and EIA in the Philippines.

Table 1. Differences between SEA and EIA in the Philippines

	SEA	EIA
SCOPE OF OPERATION	Addresses policies, plans, and programs focusing on the decision-making process	Project-specific focusing on the final assessment report of the process
TIME SCALE	Longer due to broader scope and orientation on sustainability	Short term, based on project life
DATA REQUIREMENT	Requires primarily qualitative information and only necessary quantitative data	Requires more quantitative data than qualitative
METHODS/ PROCEDURES	<p>Applies continuum approaches:</p> <p><u>Impact-centered</u>: Focuses on impact assessment and is aimed at predicting enormous environmental impacts to establish prevention, mitigation, and control measures to protect the environment</p> <p><u>Institutions-Centered</u>: To effectively deal with environmental and social effects of policies, plans, or programs, when these effects cannot be predicted due to uncertainty on the concrete and complex processes and conditions needed that these interventions may have downstream</p>	<p>Technical and project-approach:</p> <p><u>Technical Approach</u>: Involves detailed scientific and engineering studies, rigorous data collection, and analytical methods to predict, assess, and evaluate specific environmental impacts</p> <p><u>Project-Specific Focus</u>: Concentrates on the direct, localized, and measurable impacts of a single, defined development project throughout its entire lifecycle, aiming to identify specific mitigation and management measures tailored exclusively to that project's context and scope</p>

Source: Author's construct, based on Brifett et al., 2003.

Except for North America and Europe, SEA is typically less well-established elsewhere. Given the rate of development and the massive environmental implications of many planning decisions currently being made in the region, the need for effective strategic assessment tools is great.

Of the 11 countries and Hong Kong SAR in the Region assessed by a World Bank report, Hong Kong SAR, China, Vietnam, Korea, and Japan are most advanced in applying or introducing SEA. The Hong Kong SAR developed a legal mandate for some types of SEA, governed by a directive for policies and strategies in which detailed guidelines have been developed and applied. It is mandatory that a strategic environmental assessment must be attached for approval when a policy or plan document is submitted to the Legislative Council for funding

approval and the Executive Council for the policy approval. Since the 1990s, Hong Kong SAR has successfully applied SEA in many programs such as the Second Railway Development Study 2000; extension of existing landfills and identification; ‘territorial development strategy’; and ‘strategy study on sustainable development for the 21st Century.’

Other countries in the region also showed strong interests in SEA. In the Philippines, studies on the SEA framework were undertaken in the 1990s, and several pilot-scale SEA projects were carried out (Briffett et al., 2003). The EIA regulation (DAO 30/2003), issued in 2003, stated that “the EMB shall study the potential application of EIA to policy-based undertakings as a further step towards integrating and streamlining the EIS system.”

At the local government level, Land Use Planning System is the policy-making process that resembles SEA in terms of scope and objective. It deals with sustainability policies at the strategic level. However, land use planning deeply lacks the basic structure and mechanisms that SEA espouses.

2.2 Insights from Germany's Integrated Environmental Planning

Given the challenges in effectively integrating strategic environmental considerations, particularly within existing land use planning frameworks where SEA is not yet fully established, examining how more mature systems address these issues offers valuable perspectives. A brief look into Germany's approach to environmental assessment and spatial planning provides a relevant example of a robust system. Recognizing the varying degrees of SEA implementation globally, Germany's system is particularly noteworthy for its well-established integration of environmental assessment at the planning level. This framework allows for the assessment of long-term environmental impacts directly at the strategic planning stage, often incorporating principles of SEA, thus presenting a model for a more anticipatory and holistic approach to environmental governance. This contrasts with many other jurisdictions where project-level EIA often remains the primary, and sometimes only, legally mandated environmental review tool, despite its limitations in strategic contexts.

In Germany, SEA is notably well-implemented in local land-use planning, regional planning, and local landscape planning, while its implementation in sectoral planning shows greater variation (Weiland, 2010). Significant progress in SEA practice, particularly in urban, regional, and landscape planning, has been evident since the enactment of the European SEA Directive (European Parliament and the Council, 2001), leading to the development of numerous environmental assessments and practice guidelines across Member States.

The EU SEA Directive was formally transposed into German federal law between 2004 and 2005. This integration occurred primarily through amendments to key spatial and land-use planning legislation, specifically the Federal Building Code (Bundesbaugesetz) and the Spatial Planning Act (Bundesraumordnungsgesetz). Concurrently, the Directive's principles were

incorporated into the extended EIA Act and the respective EIA Acts of most German states (Rehhausen et al., 2018). It is noteworthy that prior to this national implementation, federal agencies in Germany had not engaged in voluntary SEAs, and even the Federal Transport Infrastructure Plan 2003, developed post-EU SEA Directive adoption, only involved a voluntary environmental risk analysis without public participation (Fischer, 2006). This highlights an evolving landscape where federal-level legislative initiatives are now also subject to impact assessments, including sustainability assessments (Rehhausen et al., 2018, Section 5.3).

The comprehensive scope of the EU SEA Directive, as transposed into German law, mandates environmental assessment during the preparation and prior to the adoption of a wide range of public plans and programs. These include, but are not limited to, those in sectors such as land use, transport, energy, waste and agriculture.

The directive applies to plans and programs prepared and/or adopted by a competent authority, subject to legislative, regulatory, and administrative rules. This encompasses plans setting the framework for development consent of projects under the EIA Directive, those requiring assessment under the 'Habitats' Directive, and plans likely to have significant environmental effects, determined either case-by-case or by specifying types of plans (European Parliament and the Council, 2001).

Germany's foundation for integrated urban development was significantly shaped by legislation such as the Federal Spatial Planning Act of 1965 and, critically, the Federal Building Act (Bundesbaugesetz) adopted on June 23rd, 1960. The latter provided a uniform regulation of urban development law, replacing a fragmented system of specific laws. It established a system capable of meeting modern urban development objectives by conclusively regulating the delimitation of functions between spatial planning, urban planning, and building control law/building regulations. Furthermore, it differentiated between local self-government and direct administration by higher levels of government (Federation and state) in urban planning, requiring local authorities to organize and control urban development through urban land-use planning in conformity with federal and state spatial planning (1960, 1965). This established framework underpins the systematic integration of environmental considerations at various planning levels in Germany.

2.3 EIA and Relevant Environmental Policies in the Philippines

During the era of development and political centralization (1970s to 1986) in the Philippines, the country enacted its first environmental management measure through RA 3931 (The Pollution Control Law) in 1976, which was modified through PD 984 (National Pollution Control Decree) in the same year. It was declared a national policy to prevent, abate, and control pollution of water, air, and land for the more effective utilization of the country's resources.

Meanwhile, the country's EIA system was initially conceived in the Philippine Environmental Policy through Presidential Decree (PD) 1151. The actual establishment of the EIA System began with PD 1586 in 1978. This decree empowered the President to declare specific projects, undertakings, or areas in the country as environmentally critical and prohibit the undertaking or operating of such environmentally critical projects without first securing an Environmental Compliance Certificate (ECC) issued by the President or his/her duly authorized representative.

Subsequent environmental policies in the country were responses to international agreements during the era of expansion and political pluralization (1987-present). Figure 1 presents the two-era history of international platforms and corresponding Philippine legislations.

International Agreements

In response to the research during the 1970s which indicated that man-made chlorofluorocarbons (CFCs) reduce and convert ozone molecules in the atmosphere (Jachtenfuchs, 1990), the Vienna Convention for the Protection of the Ozone Layer, a multilateral environmental agreement was signed in 1985 that provided frameworks for international reductions in the production of chlorofluorocarbons due to their contribution to the destruction of the ozone layer, resulting in an increased threat of skin cancer (Nolan, 1995). This agreement was closely followed by the Montreal Protocol on Substances that Deplete the Ozone Layer. Finalized in 1987 and entered into force in 1989, the Montreal Protocol was the landmark multilateral environmental agreement that regulates the production and consumption of nearly 100 man-made chemicals referred to as ozone-depleting substances (UNEP, n.d.). Then, the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal was enforced in 1992 to protect human health and the environment against the adverse effects of hazardous wastes (UNEP, n.d.). In the same year, the Earth Summit was held to address urgent environmental protection and socio-economic development problems. The assembled leaders signed the Convention on Climate Change and the Convention on Biological Diversity, endorsed the Rio Declaration and the Forest Principles, and adopted Agenda 21, a 300-page plan for achieving sustainable development in the 21st century (UN, 1997).

In 1997, the Kyoto Protocol operationalized the United Nations Framework Convention on Climate Change (UNFCCC) by committing industrialized countries to limit and reduce greenhouse gases (GHG) emissions in accordance with agreed individual targets. The Kyoto Protocol was based on the principles and provision of the Convention and followed its annex-based structure. It only binds developed countries, and places a heavier burden on them under the principle of "common but differentiated responsibility and respective capabilities." It recognized that they are mainly responsible for the current high levels of GHG emissions in the atmosphere (UNFCCC, n.d.). By 2001, the Stockholm Convention on Persistent Organic Pollutants was signed. This environmental treaty aims to eliminate or restrict the production and use of persistent organic pollutants (UNEP, n.d.).

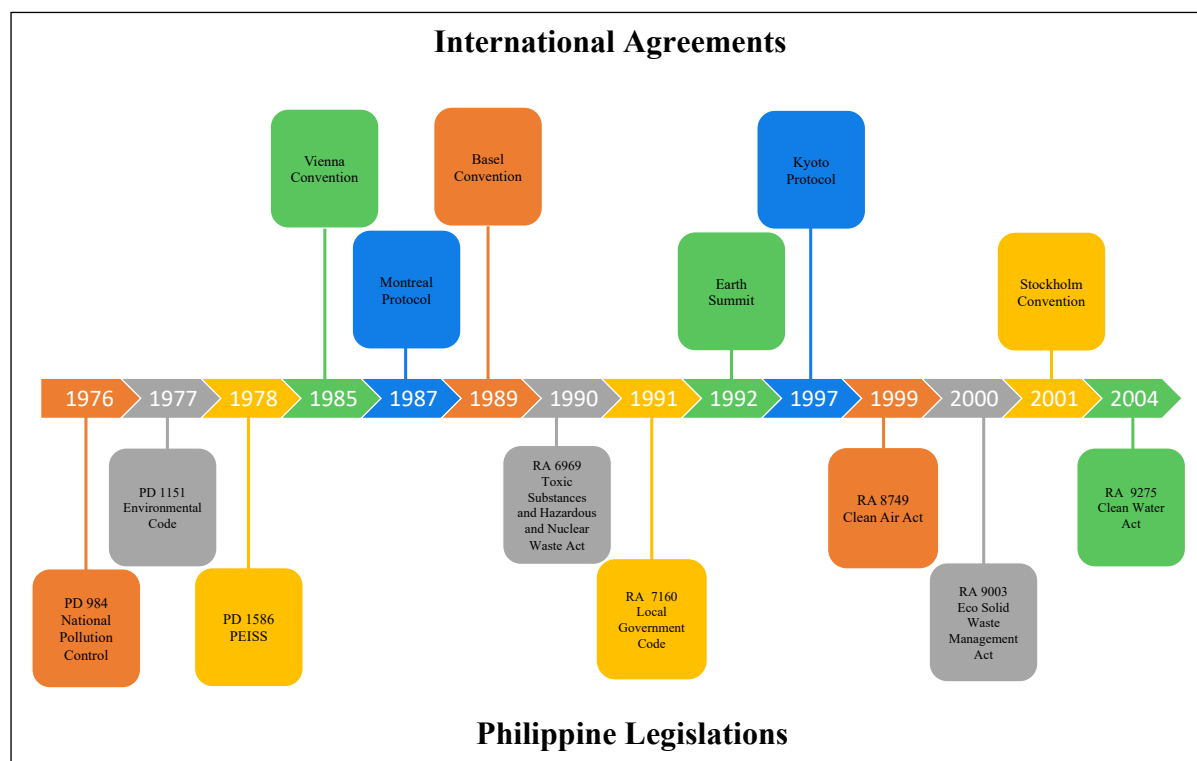


Figure 1. International Agreements and Philippine Laws of Environmental Management Measures

Source: Author's construct

Philippine Legislations

The Philippines enacted RA 6969 (Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990) on 26 October 1990 to address increasing problems associated with toxic chemicals and hazardous and nuclear wastes. The Act seeks to protect public health and the environment from unreasonable risks posed by these substances. Implementing rules and regulations of this law require that hazardous waste management shall comply with the requirements of PD 1586 (EIA System Law) and other enacted environmental laws.

In 1991, the country enacted the New Local Government Code (RA 9160), which decentralized control and responsibility of delivering basic services to the local government units (LGUs). During this era of expansion and political pluralization, most environmental functions of the DENR were transferred to LGUs except those relating to the conduct of EIA.

Other environmental laws such as RA 8749 (Clean Air Act of 1999), RA 9003 (Ecological Solid Waste Management Act of 2000), and RA 9275 (Clean Water Act of 2004) were subsequently enacted in response to agreements made during the Earth Summit and Kyoto Protocol where the Philippines was among the signatories/ratifiers. Regulatory functions and monitoring compliance of these laws fall under the DENR-EMB in addition to PD 1586 and RA 6969.

The evolving policy environment of EIA from 1977 has been shaped by national and global environmental measures to which the country has committed through various agreements.

In a complex and conflicting sea of policies, the EIA is continually undergoing refinement to clarify its appropriate niche in the whole Philippine development planning process.

- Is it a planning or a regulatory instrument?
- Does it seek to protect the environment, or does it support economic interests?
- Is it a tool for inhibiting or a facilitating instrument of sustainable development?
- Should the evaluation stress on science or social-cultural sensitivity?
- Does it help resolve, or does it promote conflicts in land and resource uses?

Exploring the prospects of EIA at a time when development interests are being integrated at a national scale, concerned institutions need to agree if EIA should focus on mitigation or rationalization of resource use and management or whether EIA should widen its scope of impact assessment or shift the paradigm of assessment.

In 1996, the Philippines recognized the need to integrate EIA at the policy-making level through the SEA system. The DAO 30/2003 stated, “The EMB shall study the potential application of EIA to policy-based undertakings as a further step towards integrating and streamlining the EIS system.” A conceptual framework plan for adopting the SEA system in the Philippines was proposed (IEMSD, 1996), containing generic procedures for public participation involvement throughout. Evidence of SEA in practice was collected like the Bohol Environment Code of 1998, where the vision, mission, goals, and strategies were formulated to meet the future needs of ecotourism and industrial development (Briffett et al., 2013). Other SEA initiatives included programmatic EIAs prepared for various wetland deltas in the Philippines and the master planning for Cebu and Metro Manila. Most of these were still in the early stages of preparation (Briffett et al., 2013).

Nonetheless, the above-mentioned 2006 assessment of the World Bank still rated the Philippine EIA project-oriented rather than an assessment of the whole plan. It was “reactive” rather than proactive in the prior assessment of alternatives of the overall planning.

Guidelines from planning agencies on project development and evaluation and the identification of local development priorities expressed through programs, projects, and activities (PPAs) did not mention the deliberate use of EIA results conducted for similar undertakings. Strategic policies were too abstract and wanting of measurable sustainability considerations. At best, land use plans were treated as the physical integration of traditional planning sectors and their minimum elements.

Table 2. Components in Planning

Core Element	Sector
Population	Population
Economic Activity	Agriculture, fisheries, forestry, trade, industry, services, tourism
Physical Resources	Environment, natural resources, transport
Income/Access to Services	Health, education, housing, social welfare, public works, energy, security, other services and facilities (for community groups such as the elderly, children, indigenous peoples)
Land Use	Physical integration of all sectors

Source: National Economic and Development Authority

2.4 EIA and Public Decision-Making Process

Planners know from many cases that thorough analysis does not guarantee that the results will play a crucial part in the final political decision. Neither would it be right in a democracy to use the result of formal analysis as the decisive answer in political problem-solving. Nevertheless, the EIA results should be taken into account by decision-makers – and often to a greater extent than is the case. Sager (1995) found that the results of the EIA were presented in ways that did not enhance public debate and informed political decision-making (Hilding-Ryderik, 2001).

Sager (2001), referring to several studies in the NORDIC region, asserted that although EIA is a self-contained process in itself, it operates in different planning perspectives that adapt to various policy-making approaches. In Norway, for instance, little was done to process the analytical results and help the politicians focus on the salient questions. Furthermore, in the land-use plans of many Norwegian cities, very modest use was made of the EIA results when forming the argumentative foundation of the planners' recommendation. It seriously undermined the instrumental rationality of plan-making when the analysis results were not utilized in later planning phases. The weak link between the EIA results and the reasons given for the recommendation also distorted communicative rationality.

The potential for mutual understanding was reduced when the results of the EIA did not constitute a discursive platform available to all parties. Hokkanen, as cited by Sager (2001) in studying the relationship between the EIA and policy-making, contended that public recognition of the ineffectiveness of the EIA as a policy-making instrument was partly responsible for the low level of public involvement. He raised an important issue when asking whether it is more important to expand public participation or to make the content of the EIA more versatile. Here, Sager suggested planners need to improve their communication with the politicians as well as with the public and that there was simply no point in increasing the resources used to produce analytical results that were likely to be ignored in the political decision process (Sager, 2001).

In Denmark, Sager (2001) commented on a proposal for the scoping of the environmental impact study that was ambiguous to be reflected in the final decision reflected in the findings of the EIA. This was regarded as a major problem that the Norwegian Parliament made a decision on the Gardermoen airport that was too detailed. A mismatch was created between the strategic level of the EIA and the detailed information needed to sustain the parliamentary decision.

Stenstadvold, as cited by Sager (2001), proposed a two-tiered process calling for a regional type of EIA at the first strategic stage and a more detailed impact assessment to follow later as lower-level decisions have to be made. The two-tiered process may lead to a more streamlined strategic planning process and a better fit between the EIA process and the political decision process. Conflicts erupted in the Gardermoen case because important decisions were already made when the municipalities fully entered the detailed planning phase. When the municipalities called their attention to the EIA to induce adjustments to the airport project, the proponents would counter by referring to the parliamentary decision. Therefore, one reason for the insufficient use of EIA results was that the Parliament's detailed decision included success criteria for the airport and the rail link. This severely limited the available options in the detailed planning of the project, to which the EIA was meant to provide important input. Stenstadvold also suggested that establishing an environmental monitoring program for the implementation of projects might strengthen the use of EIA results in that phase. Despite the above complaints, one should not underestimate the positive role of the EIA in giving the experts and the public access to the decision-making process and in making the municipalities commit themselves to the plan. Moreover, there were difficulties in determining to what extent the EIA results were actually used. A main task of the EIA is to inform the politicians, and they may have seen the results and considered them even if their final decision is unfavorable with respect to some environmental qualities (Sager, 2001).

Accordingly, as far as the issue of decision-making is concerned, EIA has several strong points. It has provided us with a standard process with clear rules on the start-up of the process, time limits, and final decision and appeal procedures (Sager, 2001). On the other hand, EIA can be described as an extensive bureaucracy with no or limited effect on the final decision on the project in question. The very nature of EIA can partly explain this defect. As a process or procedural tool, EIA did not include environmental policy statements or environmental criteria; the EIA process can only lead to a decision beneficial for the environment if the required environmental policy and environmental criteria are in place elsewhere.

2.5 Public Decision-Making Models

Popular models that can be associated with public policy making are synoptic or rational choice, incrementalism, and mixed scanning.

The rationalistic model (Banfield, 1959) requires complete scanning of all relevant data and choices, often impossible to heed. It requires the collection of enormous quantities of facts, the use of analytical capabilities we do not readily command, and knowledge of consequences that are far away in time. Synoptic planning has roughly four classical elements: goal setting, identification of policy alternatives, evaluation of means against ends, and policy implementation (Hudson et al., 1979). Synoptic planning is criticized for its bias toward central control—in the definition of problems and solutions in evaluating alternatives and in the implementation of decisions.

In the incrementalist decision model (Lindblom, 2003), on the other hand, decisions are either tentative or remedial, where small steps are taken in the “right” direction whenever the present course proves to be wrong or problematic. However, the moment decision-makers evaluate these small steps— which they must do to determine whether they are in the right course— they must refer to broader guidelines. These more comprehensive criteria are not formulated incrementally but have all the hallmarks of grand, *a priori* decisions. However, without such guidelines, incrementalism amounts to drifting to action without direction.

The mixed scanning decision model involves two sets of judgments: the first is broad, fundamental choices about the organization’s basic policy and direction; the second is incremental decisions that prepare the way for new, basic judgments and implement them once they have been made. Thus, mixed scanning is much less detailed and demanding than rationalistic decision-making but still more comprehensive than incrementalism – and less likely to be limited to familiar alternatives (Etzioni, 1989).

What is EIA to land use planning? While EIA has two standpoints: regulatory and planning, the latter gives the best locus of review. EIA introduces, discusses, examines, evaluates, and produces well-grounded environmental reasoning on which a political decision can or should stand. Hence, in principle, the decision-making model that fits EIA is more akin to the rationalism model.

2.6 Call for Integration of EIA in the Decision-Making Process

It has for long been a standard criticism of procedural planning theory that it is purportedly context-free. Sager (2001) cited Mandelbaum, who contended that “normative procedural theories are often incomplete because they do not specify either the settings in which they apply or the anticipated outcomes.” He criticized procedural theorists for postulating “general theories of planning which seek to establish the existence of a distinctive type of thought and action without reference to any particular object which this distinctive form may be associated with in the real world.”

Decision-making on projects emphasized that the effectiveness of the EIA process is dependent on the “degree of success in integrating assessment findings into decision-making in the

planning and project cycle” and that this is frequently low in developing countries, starting too late and resulting in poor links with project implementation (Lee, 2001; Wood, 2003). Glasson et al. (1999) identified weaknesses in the closed decision-making approaches and the integration of EIA with development plans in many developing countries.

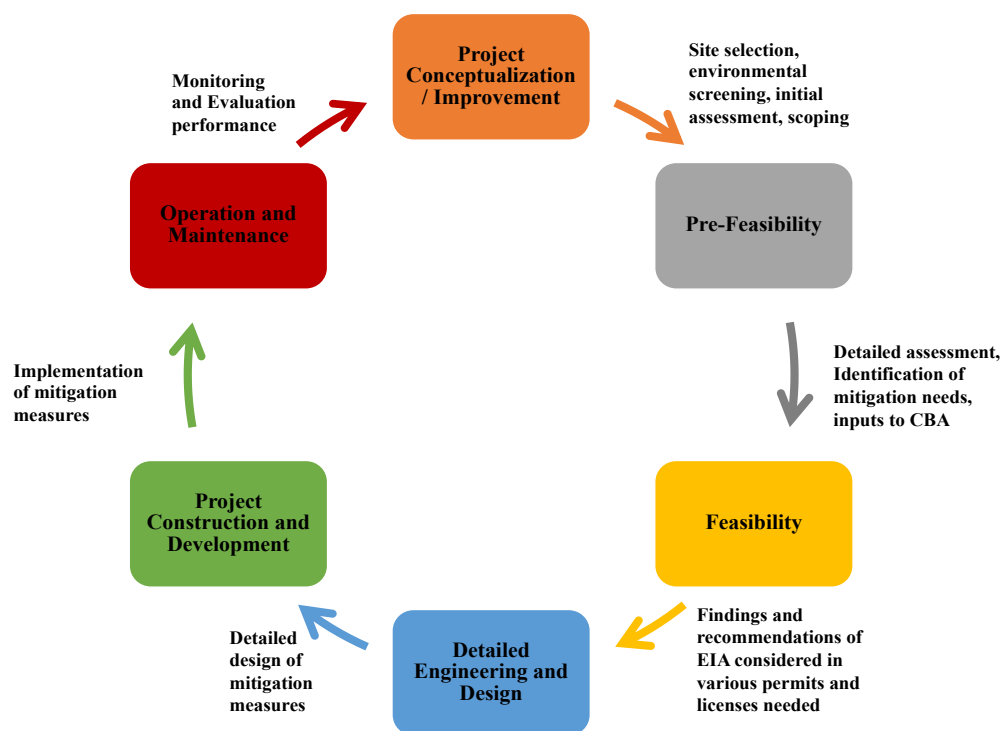


Figure 2. Environmental Impact Assessment Process and the Project Cycle
 Source: NEDA Project Development Manual

Too many examples existed in developing countries of mechanistic EIA reports being produced that have little or no effect on decisions. As Bisset (1992) stated, most EIAs seem to have been a function of justifying a decision (usually to develop) that has already been made and were concerned only with remedial measures. One of the major limiting factors concerning the development of Asian EIA practice is “...the lack of effective communication of EIA results and recommendations to decision-makers” (Lohani et al., 1997). In some eastern Asian countries, “EIA begins after the construction commences or after the project has secured prior approval in principle from authorities, and is used only to confirm that the environmental consequences of the project are acceptable” (Briffett, 1999). In Thailand, Indonesia, and Malaysia, political and business support for EIA was low and environmental agencies were virtually powerless compared with economic development agencies (Wood, 2003).

Changes were needed in two principal problems: the lack of willingness to integrate EIA into project planning or decision-making and the secretive nature of EIA and decision-making. (Lee, 2001; Wood 2003) Accordingly, these needed changes within the project cycle, in the decision-making context, and the appraisal methods and procedures.

Two possible solutions to the inadequate integration of EIA into decision-making in developing countries presented themselves. First, the problem of top-down EIA can be partially overcome by a real (rather than a 'lip service') commitment by leaders of developing countries to use EIAs in decision-making. However, countries were much more likely to use EIAs in decision-making if the EIA system responds to their needs, is designed and implemented by their nationals, and generates simple, easy-to-use, focused EIA reports (McCormick, 1993). In other words, the EIA process needed to be rooted in the indigenous culture of decision-making (even if this is top-down rather than bottom-up) instead of being imposed by national government authorities or external aid agencies.

Second, piercing the shroud of secrecy could begin if development (assistance) agencies took the lead in publicizing how EIA influenced their own decisions. This would involve a considerable but necessary change in many cases. An agency could then reasonably demand, perhaps as a condition of assistance — for nationally or internationally funded projects, that the government published the EIA report and the reasons for its decision. However, as Abaza (2000) has stated, this attitude of some developed countries can be interpreted as something approaching 'environmental imperialism' within some low- and middle-income countries.

Any decision-making model did not come “out of the blue”; neither was it primarily the result of one planner’s arbitrary or idiosyncratic improvisation. Style is linked — probably in some loose way — to the institutional environment via the characteristics of the planning agency. Because the EIA tasks are so central to the planning process, the planning style is largely the question of to whom the EIA process is designed. How much weight to put on technocratic analysis? How to open up the computational and analytic black box? How to balance refinements of the single items of the EIA against the advantages of making the analysis accessible to laypeople? How to make the EIA an important input into the democratic process of community preference formation? In addition, how to promote the use of the EIA results in political decision-making?

Finding reasonable solutions and answers to the above questions required thorough deliberation upon the organizational framework of the EIA process. The difficulties encountered in the Nordic cases were not caused by the incompetence of one planner or the rigidity of one bureaucrat. The achievement of success depended on giving all the involved parties the right incentives. In addition, doing this entailed careful design of EIA procedures, planning agency characteristics, politician-planner relations, and the institutional planning environment in general.

In the Philippines, a report made by the Philippine Rural Reconstruction Movement (PRRM, 2005) cited the following:

- Inadequate training of assessors and reviewers within the implementing agency;
- Public participation is not systematic, and its impact on decision-making is still undetermined;

- Social acceptability requirement (i.e., Local Council endorsement) is superficial and lacking in mechanism to incorporate equity considerations;
- Questionable practices by public servants where people involved in monitoring compliance are the ones preparing the Environmental Impact Statement — creating biased studies in favor of project proponents;
- Political intervention determines the outcome of some environmental reviews;
- No proper economic valuation of natural resources and their intangible ecological services;
- Limited, if not, inaccurate, database and information system that is accessible to key stakeholders and the public; and
- There is no deliberate effort to integrate EIA into local land use and development planning and apply EIA concepts/principles and tools to evaluate the environmental impacts of national and regional policies.

Chapter 3: Conceptual Framework

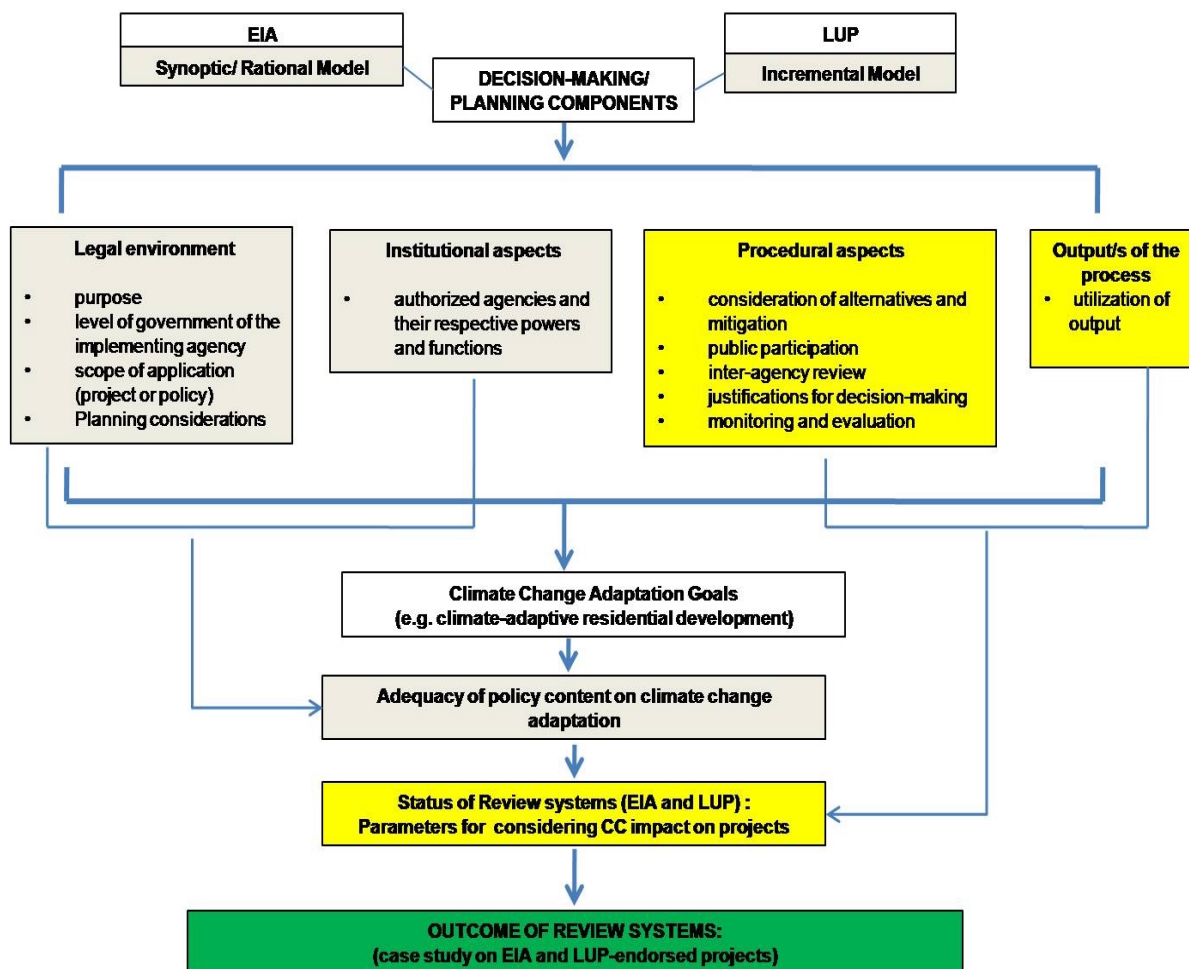


Figure 3. A Conceptual Framework

Source: Author's construct

The study framework capitalizes on EIA as a planning tool. As such, it is compared with LUP. EIA represents a rational planning approach which follows a systematic and structured configuration of problem solving up to decision-making. Comparatively, LUP is demonstrative of an incremental method where a project is evaluated by looking at its components individually or in smaller parts. Both planning systems have comparable components:

- Policy or Legal Environment – framework of laws, regulations, policies
- Institutional – organizations and structures implementing these systems
- Procedural Aspect – planning cycle and methods of analysis used
- Outputs – refer to process outcomes

Both systems recognize climate change as a development challenge. Based on the history of natural disasters and climate variability in the country, the disruptive effects of climate-related disasters, mainly in the built environment, can be addressed through prescriptive approaches. The case sectors chosen were residential developments in urban areas where the affected population resides.

The analysis of both planning systems in the climate regime starts with an understanding and mapping of the climate adaptation goals of the country, specifically for residential development. Both systems were assessed regarding the adequacy of policies on climate change adaptation and how these policies translate to prescriptive processes and methods to mitigate climate change impacts. The outcomes of these processes in the two study areas indicated the effectiveness and weaknesses of the systems in creating risk-sensitive residential development in the face of climate-related disasters.

Hereon, proposed land use changes are shaped by policies and strategies to provide more specific direction to the next wave of development projects. In addition, because EIA findings are integrated into policy formulation, the monitoring results can align from project to strategic goal.

To ensure the integration of EIA in the whole planning process, policies, institutional and procedural changes will be harmonized and streamlined.

Specifically, the analysis of EIA and land use planning are anchored on the following concepts:

1. Both EIA and LUP are systems with planning (decision-making) perspectives, given that they both operate within the context of public policy.
2. Based on the legislation and subsequent policies that govern LUP and EIA, both systems reflect two different planning (decision-making) paradigms, if not opposing. LUP is incremental, while EIA is synoptic or rational.
3. No decision model, however, is perfect. In this study, significant aspects for consideration in both study areas are the respective policy (legal) environment operating, the institutional structure that executes the decision-making process, the process by which decisions are reached, and the utilization of the outputs that capture the decision.
4. Thus, no decision model in itself can be subordinate to another. These systems have precisely the same basic components: legal environment, institutional aspects, procedural aspects, and outputs of the process.
5. Suppose both decision models are harmonized in terms of the policies that legitimize the process and define the institutional structures. In that case, the result will be a shift in the decision model that will redefine critical procedures and link outputs, leading to integrating both systems at both policy and operational levels (SITAR models, 1979, October).

Chapter 4: Methodology

4.1 Research Design

The research design used in this study is a comparative case method, specifically "two-case" case studies, to examine how the implementation of the EIA and LUP system affected the residential development in Baguio City and Sta. Rosa City, in the purview of climate adaptability. This approach is particularly suited to exploring 'how' and 'why' questions concerning the implementation and interface of systems. An advantage of a "two-case" case study design over a single-case study, according to Robert Yin (2009), is that the two case studies "strengthen the findings even further" (Yin, 2009) through cross-case comparison and replication logic. These findings strengthen the need to integrate the EIA in the land use planning system, particularly in the climate-adaptive residential development planning at the municipal level.

This study combined the qualitative and quantitative approaches to answer the research problems and objectives of the study shown below.

Table 3. Research Problems

Research Problems	Objectives
1. What is the relationship between EIA and Land Use Planning System? a) What are the essential similarities, differences, and possible linkages between the Environmental Impact Assessment and Land Use Planning System in the Philippines in terms of policy, scope of application, process, institutional arrangements, and outputs? b) How is EIA related to Land Use Planning System?	Provide a Comparative Review: EIA and LUP systems of the Philippines Establish the extent of the relationship of the EIA to the decision-making process applied in land use planning
2. How did the EIA and LUP direct the residential development, in the purview of climate adaptability, in the case of two cities in Baguio and Sta. Rosa.	Ascertain the important components of EIA that facilitate and hinder the formulation of land use decisions, particularly those impacting climate-adaptive/risk-sensitive residential development in cities; and,
3. What are the possible areas for integration? a) What components of EIA can be integrated into the Philippine land use planning system to aid the decision-making toward climate change mitigation and adaptation? b) What are the preconditions for this integration?	Provide recommendations in line with climate change adaptation goals to integrate the EIA system as a support mechanism into the land use planning system.

4.2 Fieldwork Tools

Methods of Data Collection

1. Gathering of Secondary Data and Information

National environmental legislation, including environmental impact assessment system, climate change adaptation, land use policies, guidelines and their corresponding implementing rules and regulations (IRR), circulars, memoranda, and directives, were gathered from the Official Gazette of the Republic of the Philippines. These were reviewed and analyzed to establish their purpose, institutional arrangement, the scope of application – whether project or policy, and planning considerations. Whereas, planning documents such as ecological profile, Comprehensive Land Use Plan (CLUP), Comprehensive Development Plan (CDP), and zoning ordinance (ZO) were collected from both case study areas: Sta. Rosa City and Baguio City. These were reviewed and analyzed to determine their compliance with said national environmental legislations.

Other data and information gathered, reviewed, and analyzed were the following:

1. Masterlist of Environmental Compliance Certificates (ECCs) issued by the EMB-DENR) from 2005-2010;
2. Masterlist of building permits issued by both case study areas from 2005-2010;
3. Disaster Management Reports from regional and local bodies;
4. Assessment reports on landslide incidents following Typhoon Parma, known in the Philippines as Typhoon Pepeng/Ketsana and Ondoy;
5. EIA studies on residential and mixed-use projects (commercial with residential use) and EIA review reports by the EMB-DENR; and
6. Compendium of zoning permits/ certificate of zoning since the enactment of the LGU's ZO from both case study areas.

2. Key Informant Interviews (KII)

Selected officials of the DENR whose scope of responsibilities, among others, involve review and approval of EIA, and monitoring compliance of national government agencies (NGA) and local government units (LGU) with environmental laws, and heads of the respective city planning and development office of Sta. Rosa City and Baguio City were interviewed to validate analyses derived from secondary data and information specifically regarding the national environmental legislation and their corresponding IRR. Their opinions on the general implementation of these environmental laws were ascertained as well. See Appendix 1 for the KII Questionnaire.

3. Survey

The survey was conducted to gauge the perception of the residents of two case study areas from both Sta. Rosa City and Baguio City on how the public sector manages the effects of climate-related hazards such as landslides and flooding on the built environment.

Sampling

The survey entailed a purposive quota sampling method. Determined through quota sampling, a total of one hundred (100) respondents were interviewed from the residents of the case study areas from both Sta. Rosa and Baguio City. This quota was equally divided into two (2) strata: fifty (50) residents from Balibago and Poooc in Sta. Rosa City and fifty (50) residents from City Camp and Cresencia Village in Baguio City. Systematic sampling was done at the ordered listing of names of the homeowners of the residential communities in the case study areas. Finally, willing to be interviewed and share their experiences were randomly selected for each residential community in the case study areas.

Interview Guide

The interview guide is a three-page document that started with a brief message to the respondent introducing the interviewer, informing about the purpose of the survey, and requesting full cooperation. Including the respondent's information, the questionnaire has twenty (20) questions that contain ten (10) items of closed-ended, three (3) open-ended, three (3) categorized, and three (3) Likert-scaled questions. See Appendix 2.

4. Triangulation of data from Key Informant Interviews, survey, and secondary literature

To achieve a comprehensive and robust understanding of climate-adaptive residential development and hazard management in Baguio City and Sta. Rosa City, this study employed data triangulation from secondary literature, KIIs, and a resident perception survey.

Secondary data provided the foundational regulatory context and baseline information on each city's distinct vulnerabilities (e.g., Baguio's landslide proneness; Sta. Rosa's flood susceptibility). KIIs with DENR officials and city planning heads offered implementers' perspectives on environmental law compliance, revealing challenges such as inconsistent EIA integration in Sta. Rosa and mixed perceptions of government preparedness in Baguio.

Complementing these, the resident perception survey captured community-level experiences, strongly corroborating the geographical vulnerabilities (high perception of landslides in Baguio; universal flooding perception in Sta. Rosa). This data also highlighted public reliance on informal information, indicating potential gaps in official dissemination.

By systematically comparing these diverse data sets—official frameworks, implementers' views, and resident perceptions—the study gained a nuanced understanding of policy-practice gaps and varying hazard awareness. This multi-source approach provided a robust validation of key findings, leading to a more holistic assessment of climate-adaptive strategies.

4.3 Study Areas

It is the policy of the Philippines as a State to integrate systematically the concept of climate change in various phases of policy formulation and development plans, among others. Cities are among the places of urbanity. The concentration of population and centralization of different services play a crucial role in determining the vulnerability and adaptation of an area to different environmental impacts. Baguio and Sta. Rosa cities in the Philippines played a vital role in this study.

Below is a summary of key information for the cities of Baguio and Sta. Rosa.

Table 4. Summary of Key Information of Baguio City and Sta. Rosa City

Characteristic	Baguio City	Sta. Rosa City
Land Area (km ²)	57.51 km ²	54.84 km ²
Population (PSA Census, 2015)	345,366	353,767
Annual Population Growth (2015)	+1.54%	+4.22%
Population Density (2015)	6,005 persons/ km ²	6,451 persons/ km ²
No. of Households* (2015)	89,987	101,385
Slope		Primarily 0.0-2.5%; some with 2.60-5.0%
Altitude	1400 masl	

*Excludes households in relocation areas.

Source: Philippine Statistics Authority, 2015 Census of Population

Selection of the Case Study Areas

The selection of Baguio City and Santa Rosa City as the primary case study areas for this comparative analysis was driven by a criteria-based process designed to ensure their relevance and representativeness in examining the interface between EIA and LUP in the context of climate adaptability. Unlike statistical sampling methods used for quantitative generalization, case study selection, particularly in comparative designs, relies on a strategic choice of cases that are theoretically relevant to the research questions (Yin, 2009). This approach allows for in-depth exploration rather than broad statistical inference.

At the time of this study, a critical limiting factor in the initial pool of potential candidates was the availability of fully approved and updated Comprehensive Land Use Plans (CLUPs) with corresponding Zoning Ordinances (ZOs). Only a limited number of cities in the Philippines

(approximately six at the time of consideration) had formally approved CLUPs that could provide a robust framework for assessing the study's objectives.

From this select group of cities, Baguio and Santa Rosa were chosen because they offered the most complementary contrasts essential for a two-case comparative study. Despite both being Highly Urbanized Cities (HUCs) with approved CLUPs and experience in EIA, and confronting ongoing urbanization challenges, their selection was primarily driven by their distinct profiles in terms of prevailing environmental hazards, urbanization dynamics, and geographical representation, all of which are critical variables for thoroughly examining the interface between EIA and LUP in climate-adaptive residential development.

While other cities within this limited pool might have met individual criteria, Baguio City and Santa Rosa City collectively provided:

1. **A diversity in experienced environmental hazards.** Baguio City represents a mountainous, geohazard-prone (landslides) environment, while Santa Rosa represents a rapidly urbanizing lowland susceptible to hydro-meteorological hazards (flooding). This allowed for the exploration of EIA and LUP responses to distinct climate-related risks.
2. **Varying urbanization dynamics.** Baguio City, a highly urbanized city, faces challenges of sustained development in a constrained environment. Santa Rosa City, a burgeoning economic center, exemplifies rapid, industrial-driven urbanization. These differences provided rich contexts for examining the effectiveness of planning instruments.
3. **Geographical and climatic representation.** Their locations (North vs. South Luzon, highland vs. lowland) ensured that findings would reflect a broader spectrum of Philippine urban and climatic conditions, enhancing the generalizability of the study's insights.
4. **Demonstrable planning maturity and engagement.** Both cities not only had approved CLUPs but also possessed a history of engaging with planning processes and EIA, offering tangible data and experiences for analysis.

These factors made Baguio City and Santa Rosa City the optimal pair to conduct a robust comparative analysis of how EIA and LUP interface under varied environmental and developmental pressures, particularly concerning climate-adaptive residential development. The following specific criteria further guided their final selection:

- (a) Presence of residential communities that experienced climate-related disasters such as floods and landslides

Baguio City: With its physical characteristics like being located in a seismically active region, situated in mountainous environments, stripped-off vegetation, moreover

frequent periods of intense rainfall, and rapid development, the city of Baguio has all the ingredients for a landslide-prone terrain.

Sta. Rosa City: The city is highly susceptible to earthquakes and flooding. It lies in a strongly faulted region where the West Marikina Valley Fault traverses, aside from its minor steep faults, through the city towards the entire Laguna region. However, flooding affects the city all year round as floodplains sprawl a total area of 302 hectares. In low flood plains, slight seasonal run-off flooding subsides from few hours to three days due to run-off accumulation coming from surrounding elevated areas, the low physiographic positions, poor infiltration, permeability characteristics, and drain ability outlet. Whereas moderate seasonal flooding along the coastal areas is more frequent, the areas experience deeper run-off, which subsides in a week to a few months.

(b) Experience with projects subjected to the EIA process

Baguio City: The study area is subjected to the EIA process. Project development has been granted an Environmental Compliance Certificate as required by the DENR-EMB. The processing for securing permits is done at the regional level, not local.

Sta. Rosa City: The study area is also subjected to the EIA process. The regional office is also the primary authority for processing the Environmental Compliance Certificate as applied for by the project proponent/developer.

(c) Presence of approved land use plans and enacted zoning ordinances

Both cities (Baguio and Sta. Rosa) have a CLUP with corresponding Zoning Ordinances. The study areas in both cities complied with the zoning ordinance for residential zoning.

(d) Geographical representation

The selection intentionally included cities from distinct geographical regions within the Philippines. Baguio City represents a highly urbanized center in Northern Luzon, characterized by its mountainous terrain and unique environmental challenges. Santa Rosa City, conversely, represents a rapidly developing area in Southern Luzon (CALABARZON region), typifying lowland urbanization and its associated environmental issues. This geographical diversity allows for a broader comparative analysis of how environmental planning systems operate across varied Philippine contexts.

In essence, Baguio City and Santa Rosa City offer contrasting yet representative cases-- one a highly vulnerable highland urban center, the other a rapidly urbanizing lowland city prone to flooding-- both with established planning frameworks and extensive experience with

environmental regulations. This dual-case approach allows for a robust comparative analysis of how EIA and LUP interface under varied environmental and developmental pressures, particularly concerning climate-adaptive residential development.

4.4 Methods of Data Analysis

The study applied document analysis to secondary data providing a “systematic review and evaluation of documents” from the Official Gazette of the Republic of the Philippines. This technique yielded specific knowledge and more understanding of the study, such as the purpose, institutional arrangement, scope of application – whether project or policy, and planning considerations (Bowen, 2009). Furthermore, official planning documents, five years of government compliance certificates, and zoning permits for both case study areas (Sta. Rosa City and Baguio City) were similarly reviewed and analyzed to determine compliance to national and local environmental legislation. In addition, other assessment reports, EIA studies, and EIA reviews, particularly on residential and mixed-use projects (commercial with residential use), gave a broader perspective of the conditions in the Philippine setting on a larger scale.

The non-experimental survey results of both case study areas were analyzed using basic descriptive statistics such as mode, arithmetic mean, and percentages. The survey analysis described, compared, and measured the central tendency of the respondents' perspectives concerning how the public sector manages the effects of climate-related hazards such as landslides and flooding on the built environment.

The KII results comprising transcribed qualitative data were subjected to thematic analysis. The transcribed data were organized into themes relevant to the problems of the study. This mainly validated the analyses derived from secondary data and national environmental legislation and their corresponding implementing rules and regulations (IRR). Their opinions on the general implementation of these environmental laws were ascertained as well.

4.5 Triangulation of Data

Triangulation is a method the author sees as appropriate for a mixed research design—qualitative and quantitative—that produces various data for this study. The triangulation of data from legal documents, other secondary literature, survey, and Key Informant Interviews presented a deeper analysis of how the EIA and Land Use Planning interplayed as applied in both cases of mixed commercial and residential land use in Sta. Rosa City and Baguio City. The results from the survey and KIIs validated and reinforced each other, hence, providing more credibility to the analysis.

Chapter 5: A Comparative Review: Environmental Impact Assessment and Land Use Planning System of the Philippines

5.1 The Philippine Environmental Impact Assessment System

5.1.1 Concept and Principles

The concept of EIA in the Philippines started in the 1970s when global awareness of environmental issues arose. The Philippines was one of the pioneers that initiated the adoption of EIA in its local government system. With such, this law [PD 1586, Environmental Impact Statement System] mandated all of the national government agencies – be it government-owned or privately owned projects or programs – to acquire or prepare an Environmental Impact Statement (EIS) (Supetran, 2013).

The EIS is a detailed statement that contains the environmental impact of a proposed action, project, or undertaking; any adverse environmental effect which cannot be avoided should the proposal be implemented; alternative to the proposed action; a determination that the short-term uses of the resources of the environment are consistent with the maintenance and enhancement of the long-term productivity of the same; and, whenever a proposal involves the use of depletable or non-renewable resources, a finding must be made that such use and commitment are warranted (PD 1151).

Principles of EIA in the Philippines focus on balancing socio-economic and environmental development, following the path of sustainability. The following are the basic principles used in the EIA system of the Philippines (DAO 2003-13):

- a. The EIS System is concerned primarily with assessing the direct and indirect impacts of a project on the biophysical and human environment and ensuring that these impacts are addressed by appropriate environmental protection and enhancement measures;
- b. The EIS System aids the proponents in incorporating environmental considerations in planning their projects as well as determining the environment's impact on their project;
- c. Project proponents are responsible for determining and disclosing all relevant information necessary for a methodological assessment of the environmental impacts of their project;
- d. Three general criteria shall guide the review of the EIS by EMB: (1) that environmental considerations are integrated into the overall project planning, (2) that the assessment is technically sound and proposed environmental mitigation, measures are effective, and (3) that social acceptability is based on informed public participation;

- e. Effective regulatory review of the EIS depends largely on timely and accurate disclosure of relevant information by project proponents and other stakeholders in the EIA process;
- f. The social acceptability of a project is a result of meaningful public participation, which shall be assessed as part of the ECC application, based on concerns related to the project's environmental impacts; and
- g. The timelines prescribed by this Order, within which an ECC must be issued or denied, apply only to processes and actions within the Environmental Management Bureau's (EMB) control and do not include actions or activities that are the proponent's responsibility.

5.1.2 Policy and Legal Environment

With the aim to attain and maintain a rational and orderly balance between socio-economic growth and environmental protection, PD 1586 established the Environmental Impact Statement System founded on the environmental impact statement decreed by the earlier PD 1151 for every proposed project and undertaking deemed significantly affecting the quality of the environment.

For guidance in determining which areas and types of projects are environmentally critical and within the scope of the EIS system, Proclamation No. 2146, series 1981 (Proclaiming Certain Areas and Types of Projects as Environmentally Critical and Within the Scope of the Environmental Impact Statement System Established Under PD 1586) identified heavy industries, resource extractive industries, and infrastructure projects as Environmentally Critical Projects (ECPs) and 12 areas as Environmentally Critical Areas (ECAs). See Appendix 5.

Later in 1996, Proclamation No. 803 (Declaring the Construction, Development and Operation of a Golf Course as an Environmentally Critical Project Pursuant to PD 1586) ordered the “construction, development and operation of a golf course” as included under the ECP.

With the reorganization of DENR in 1987 (Executive Order No. 192, Providing for the Reorganization of the Department of Environment, Energy and Natural Resources, Renaming it as the Department of Environment and Natural Resources, and For Other Purposes), the EMB was created, one of whose primary functions include recommending *rules and regulations for EIA and providing technical assistance for their implementation and monitoring*. Said function was emphasized in Executive Order No. 292, 1987 (Instituting the Administrative Code of 1987).

Subsequently, a series of Executive and Administrative issuances were passed to improve and rationalize the implementation of the PEIS and strengthen the capability of DENR to do so – EO 291, series 1996 (Improving the Environmental Impact Statement System) and AO 42,

series 2002 (Rationalizing the Implementation of the Philippine EIS System and Giving Authority in addition to the Secretary of the DENR, to the Director and Regional Directors of the EMB to Grant or Deny the Issuance of ECCs). They also urged project proponents to conduct simultaneously the EIS (as required for ECC application) and the feasibility study of the proposed project. Most importantly, recognizing the acquired competence of the EMB in the field, AO 42 granted the EMB Director and Regional Directors authority to grant or deny the issuance of ECCs, in addition to the Secretary of the Environment and Natural Resources.

Within the DENR, Implementing Rules and Regulations (IRR) for the Philippine EIS System were formulated through Department Administrative Order (DAO) 2003-30. To date, the latest Revised Procedural Manual (RPM) for said IRR, promulgated by Memorandum Circular (MC) 2007-002, prescribes the procedures for the processing of applications for ECCs and CNCs within the timeframes specified in AO 42.

The role of the LGU and the involvement of legitimate stakeholders in the whole EIA process was explained in Memorandum Circular 2007-08 (Simplifying the Requirements for Environmental Compliance Certificate or Certificate of Non-Coverage Applications), Memorandum Circular 2008-08 (Clarification of the Role of LGUs in the Philippine EIS System in Relation to MC 2007-08) and Memorandum Circular 2010-14 (Standardization of Requirements and Enhancement of Public Participation in the Streamlined Implementation of the Philippine EIS System). The latter MC prescribed guidelines for determining direct and indirect impact areas and for identifying legitimate stakeholders.

5.1.3 Components of the System

Scope of the System. With the four ECPs project types and 12 ECAs, the earlier described categories have been technically defined by the EMB. MC 2007-002 broadly categorized them into (Appendix 4):

- a. *Single Projects* – has three groups: Group I that includes major projects such as Golf Course, heavy industries, fishery, major wood processing, etc. with EIS requirement; Group II includes minor projects with IEE as the highest requirement; and Group III, which includes all types of Group II outside EIA;
- b. *Co-Located Projects in either Environmentally Critical Area (ECA) or Non-Environmentally Critical Area (NECA)* – a group of single projects, under one or more proponents, which is located in a contiguous area and managed by one administrator, who is also the ECC applicant; and
- c. *Unclassified Projects* – projects not listed in any of the groups, e.g., projects using new processes/technologies with uncertain impacts and major groupings.

EIA Process. The EIS process generally goes through six stages grouped into three phases, as prescribed and described in the IRR/Manual:

1. Initial phase or Pre-screening/Scoping Phase:

Screening – basically determines if an EIA is needed. If so, sets the document type for preparation, the whole gamut of requirements, endorsing and decision authorities, and the duration of processing.

Scoping – would identify the proposed project's most significant issues and restrict the extent of baseline information to those necessary to evaluate and mitigate these impacts.

2. The Actual Study Phase:

EIA study and report preparation – which should be based on a good description of the proposed project, involves site characterization and prediction of impacts; evaluation of impacts and proposed alternatives; and identification and assessment of mitigating measures. Study results are presented in an EIA Report, which shall correspond to the type of project as discussed earlier.

EIA report review and evaluation – are undertaken either by third party experts commissioned by EMB or DENR-EMB internal specialists, the Technical Committee. EMB evaluates the recommendations of the EIA Review Committee (EIARC) and the public's inputs during public consultations/hearings, leading to a draft decision document.

Decision-making – involves evaluating EIA recommendations and the draft decision document, resulting in the issuance of an ECC, CNC, or Denial Letter. In the case of a granting of an ECC, it is then transmitted to concerned LGUs and other government agencies for integration into their decision-making process.

3. Post - Environmental Compliance Certificate:

Monitoring, validation, and evaluation/audit stage – assesses the performance of the proponent against the ECC and its commitments in the Environmental Management and Monitoring Plans to ensure actual impacts of the project are adequately prevented or mitigated

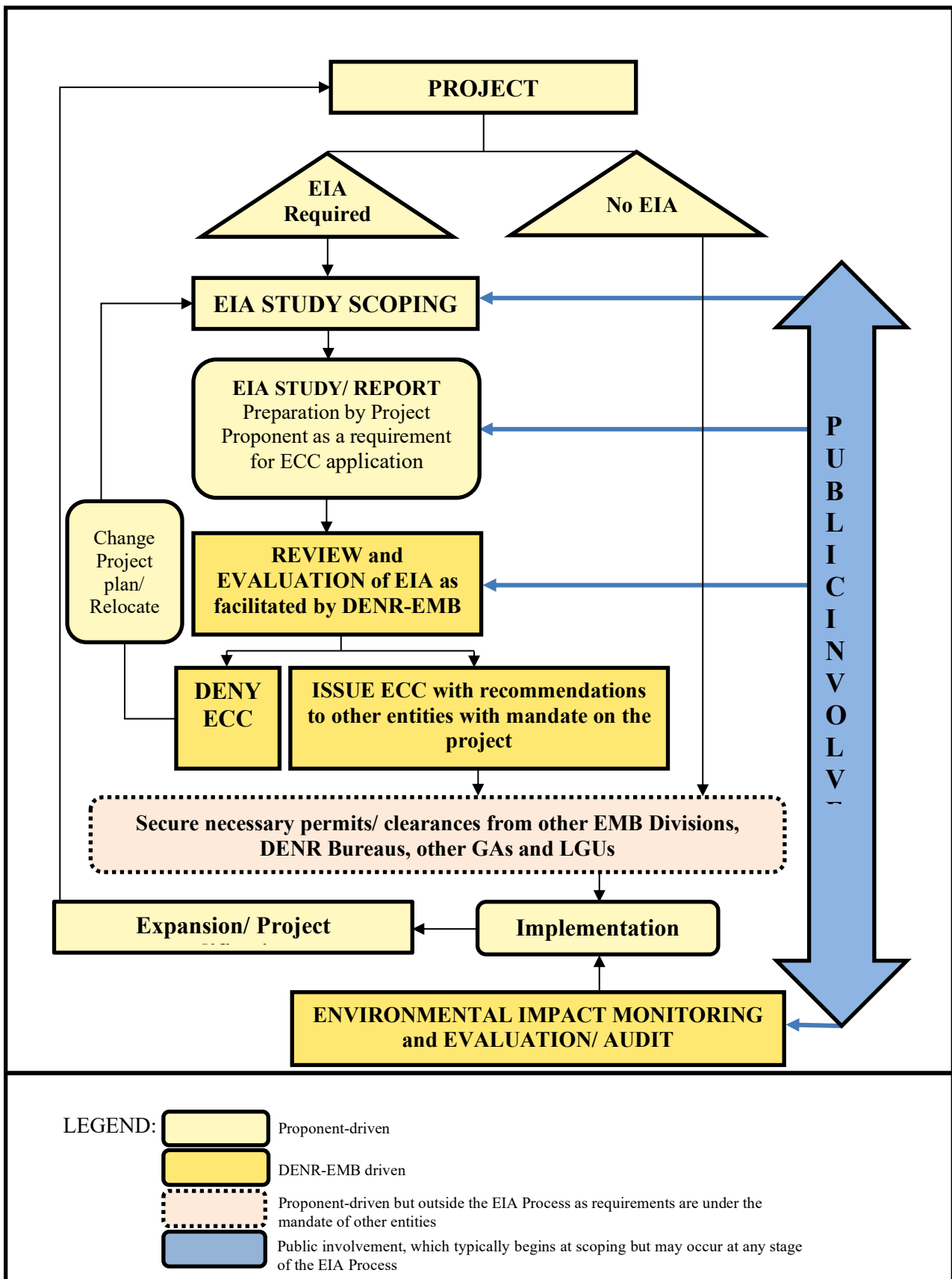


Figure 4. Summary Flow Chart of EIA Process

Source: DENR Procedural Manual, 2007

Implementing Institution, Structures, and Roles. The DENR is the main government agency having oversight for the implementation of the EIS system. Although it was not until 2002 when EMB was granted approving authority, the bureau has played a significant role in carrying out the process since its creation in 1987. Eventually, the ad hoc divisions in EMB's central and regional offices were converted into a full-fledged Environmental Impact Assessment and Management Division (EIAMD) with important functioning sections on EIA Evaluation, Impact Monitoring, and Validation, and in the Central Office, Systems Planning and Management (Section 13, DAO 2003-30). The institutional arrangement included the establishment of deciding authorities/level of decision authorities within the agency's correspondence with the project's category type.

As discussions would so far indicate, the EIA/EIS/PEIS has an adequately established structure embodying an over-arching rationale for the initiative (legal basis) with a distinct institutional arrangement. This is complemented by a set of detailed operational guidelines concerning types and categories of covered projects; EIA report types and generic contents; procedural requirements; including the roles and responsibilities among the private (proponent), government (DENR, EMB, LGU), and public sectors within the context of the EIS process.

EIA and Local Decision-Making Processes: Coordination, Control, and Authorization.

EIA is project-based, meaning EIA would be performed on projects situated within local territories over which local government units have the administrative mandate, local government agencies have jurisdiction, and where communities reside or make a living. Therefore, local decision-making in this respect within the context of EIA regulation deals with the manner of interaction, in terms of coordination, control, and authorization, among the most significant players in a locality with the end goal of moving towards an environmentally sustainable decision.

Inter-agency coordination seems to be an innate role among the proponents (the EIARC, DENR-EMB, local community, etc.) that can be perceived as early as the scoping stage of the EIA process. This assumed role could be attributed to the public and technical scoping aspect of the process.

The local counterpart and the technical committee on the EIA process, together, set the guidelines in the crafted project Terms of Reference (TOR), identify "the most significant issues/impacts of a proposed project, and... delimit the extent of baseline information to those necessary to evaluate and mitigate the impacts" (MC 002-2007). With this, control mechanisms are inevitably established, thus further guiding the succeeding steps in the EIA process resulting in a more effective context setting and framework building for the intended outcome of the study.

In summary, the notion of EIA study provides an avenue for participation as local stakeholders. The local stakeholders may serve as local expert sources, resource persons, interviewers, interviewees to optimize and facilitate access to indigenous knowledge of the environment

upon which appropriate environmental management and social development plans will be based.

Benefits and Limitations of the System. Sandler (1996) cited an international review undertaken on the effectiveness of EIA in the mid-1990s. Consistent with the study's findings, the following benefits and limitations identified can also be said of the Philippines EIA system (PEIS).

The following are the benefits or advantages of the Philippine EIA system (PEIS):

- Improved project design/siting;
- More informed decision-making more environmentally sensitive decisions;
- Increased accountability and transparency during the development process;
- Improved integration of projects into their environmental and social setting;
- Reduced environmental damage;
- More effective projects in terms of meeting their financial and socio-economic objectives; and,
- A positive contribution towards achieving sustainability.

However, some of the limitations are as follows:

On EIA scope

- Small-scale projects are not included in most EIA systems, although their cumulative impacts may be significant over time. The local government's environmental policies must address these limitations as cumulative effects also have degenerative effects on the physical environment.
- A significant limitation in the Philippine planning system is that while EIA is primarily applied to specific infrastructure projects based on thresholds (e.g., type, scale, location), CLUPs are not formally subjected to environmental assessment. Despite CLUPs having long-term and significant environmental impacts as they guide overall land development, their preparation process currently lacks a dedicated section for formal environmental evaluation or the integration of EIA. This represents a critical gap in the legal and procedural framework, allowing potential adverse environmental effects at a strategic level to go unaddressed during foundational planning stages.

On EIA application

- Difficulties in ensuring adequate and useful public involvement (or participation);
- Insufficient integration of EIA work at key decision points in relation to feasibility and similar studies in the project life-cycle; with some major decisions being made even before EIAs are completed;

- Lack of consistency in the selection of developments requiring specific EIA studies;
- Weak procedures for obtaining early agreement on the scope of EIA studies;
- Inadequate understanding of the relative roles of baseline description and impact prediction;
- Poor integration of biophysical environmental impacts with social, economic, and health effects;
- Production of EIA reports which are not easily understood by decision-makers and the public because of their length and technical complexity;
- Lack of mechanisms to ensure that EIA reports are considered in decision-making;
- Weak linkages between EIA report recommendations on mitigation and monitoring and project implementation and operation; and
- Limited technical and managerial capacities to implement EIAs.

5.2 The Philippine Land Use Planning System

5.2.1 Concept and Principles

It has been a firmly established role of the state to safeguard the public interest and promote the general welfare of its constituents. Dear and Clark (1981), Serote (1995) specifically stressed these roles as (a) supplier of goods and services; (b) regulator and facilitator of the market; (c) arbiter between contending social groups; and (d) social engineer.

In this context, the state is able to intervene in almost all aspects of community life. It can be said that public planning is a set of intervention measures that underscore these (basic) roles of the state. These general welfare goals and human rights can be further interpreted to the government's role in land administration and as a steward of the environment.

In the Philippine setting, the absence of a comprehensive national legislation on land use regulation is dealt with by utilizing the devolved powers of local governments by having them "enforce and implement nationally generated land use policies" (Serote, 2008).

Although the Philippine Constitution explicitly stated this mandate, the Local Government Code of 1991 fulfilled the regulation of land use through the comprehensive land use plan and zoning ordinance.

The LGC, as the Philippines' version of decentralization policy, showed the notion of devolution and co-management. These embodied principles are aimed to strengthen government accountability, the national government working on the country level planning activity and maintaining good international relations. Local governments are enhanced and equipped to do local planning activities; spur innovation at the local level, given that local

communities have unique resources and features that must be developed and further conserve; and make the government more responsive to the actual needs of the citizenry. The LGUs face problems at different paces and magnitudes. Thus, specific strategies must directly target their specific needs to promote more urban-regional development, not only to create and continuously enhance the urban areas but also to give equal importance to the regional and rural context and the significant relationships that sustain the urban and rural environments.

In addition, Section 15 of RA 7160 stated the two-fold functions of the LGU, such as the political and corporate nature of local government units. Every local government unit created or recognized under this Code is a body politic and corporate endowed with powers to be exercised in conformity with the law. It shall exercise powers as a political subdivision of the national government and as a corporate entity representing the inhabitants of its territory.

As a body politic, the LGU is a political subdivision of the national government endowed with the powers to manage its territorial jurisdiction for and on behalf of the government. Moreover, the LGUs are envisioned to become effective partners of the government in the attainment of national goals. As a body corporate, the LGU represents its residents, the inhabitants within its territory.

It is likewise endowed with powers and resources necessary for its efficient and effective governance to deliver basic services and facilities to enable its inhabitants to develop fully into self-reliant communities.

RA 7160 further provides the avenue to address the grassroots problems related to land. With the objective of promoting the efficient and best use of land by resolving land use conflicts and conserving ecological resources for sustainable development, several objectives in land use planning can be specifically achieved, such as:

- Promoting the efficient utilization, acquisition, and disposition of land and ensure the highest and best use of land;
- Directing, harmonizing, and influencing discussions and activities of the private and public sectors relative to the use and management of land;
- Reconciling land use conflicts and proposals between and among individuals, private and government entities relative to the present and future needs for land;
- Promoting desirable patterns of land uses to prevent wasteful development and minimize the cost of public infrastructure and utilities and other social services; and
- Conserving areas of ecological, aesthetic, historical, and cultural significance.

Land use planning enables the harmonization of varied land uses critical for local development. As defined by Section 3 of RA 7279, land use planning is the rational process “of allocating available land resources as equitably as possible among competing user groups and for different functions consistent with the development plan of the area....” Furthermore, land use planning

is the rational and judicious allocation of available land resources to different land-using activities (e.g., agricultural, residential, industrial) and for different functions consistent with the overall development vision/goal of a particular locality.

In summary, land use planning entails the detailed process of determining the location and area of land required to implement social and economic development through policies, plans, programs, and projects.

5.2.2 Policy and Legal Environment

The 1987 Philippine Constitution is considered the principal enabling law that provides for the sustainable management and development of all the country's resources, providing for the purpose by which the country's resources should be managed, used, developed, owned, and disposed (HLURB, 2013). The Philippine constitution specifically stated the grounds for the conduct of planning, as shown in Table 5.

Table 5. Legal Bases for Planning Based on the 1987 Philippine Constitution

Basis	Scope
Article 2 Sec 5	Promotion of general welfare
Article 2 Sec 16	Protect and advance the right of the people to a balanced and healthful ecology
Article 2 Sec 9	Promotion of improved quality of life for all
Article 12 Sec 3	Land ownership vis-à-vis requirements of ecology conservation
Article 12 Sec 6	Use of property bears a social function--- economic agents contribute to common good

Source: 1987 Philippine Constitution

As mentioned above, RA 7160 provides the planning and development context for the LGUs. The law provides the authority of LGUs to plan for their own development. As a centerpiece legislation that provides a framework for local development planning, the LGC assures that the national planning mandate will be devolved to the local governments. Other equally important notions of RA 7160 include the promotion of the general welfare of people (section 16); formulation of local development plans by the LGU (section 106); devolution of the delivery of the basic services and facilities (section 17); land reclassification (section 20); local government linkages to the NGOs and POs (section 35); and conduct of consultations with stakeholders (sections 26 and 27), to mention some.

Other supportive policies to the conduct of planning at the local level clarify the coordination and other legalities of doing local planning, such as the different national executive and agency directives).

Table 6. Pertinent National Directives Related to Land Use Planning

Law	Scope
Executive Order 648 (1981)	Land use control standards and guidelines which shall govern land use plans and zoning ordinances of local government units as well as adjudicatory function of hearing and deciding cases related to land use
Executive Order 90 (1986)	HLURB as the sole regulatory body for land use and housing development
Executive Order 72 (1991)	HLURB mandated to review and ratify the comprehensive land use plan (CLUP) and zoning ordinance (ZO) of highly urbanized cities, independent component cities, cities and municipalities of Metro Manila, and physical framework plans of provinces.
Joint Memorandum Circular No. 1, S. 2007	By NEDA- Methodology for preparing the Provincial Development and Physical Framework Plan (PDPFP) and the Provincial Development Investment Program (PDIP) By DILG- Methodology for preparing the Comprehensive Land Use Plan (CLUP), Comprehensive Development Plan (CDP), and the Local Development Investment Program (LIDP) using the Rationalized (Local) Planning System (RPS)

Source: Various Executive Orders and DILG RPS, 2014

Similarly, other policies having a valuable bearing in the formulation of LUPs include the following:

- a) RA 9729 (An Act Mainstreaming Climate Change into Government Policy Formulations, Establishing the Framework Strategy and Program on Climate Change, Creating for this Purpose the Climate Change Commission and for Other Purposes)

In keeping with the expressed policy of the Philippine government to systematically integrate the concept of climate change in various phases of policy formulation and development planning, RA 9729 specifically stipulates LGUs as being 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 Action Plan."

- b) Without so much changing the declared policy, RA 10174 (An Act Establishing the People's Survival Fund to Provide Long-Term Finance Streams to Enable the Government to Effectively Address the Problem of Climate Change, Amending for the Purpose RA 9729, Otherwise Known as the "Climate Change Act of 2009", and for Other Purposes)
- c) RA 10121 (An Act Strengthening the Philippine Disaster Risk Reduction and Management System, Providing for the National Disaster Risk Reduction and Management Framework and Institutionalizing the National Disaster Risk Reduction and Management Plan, Appropriating Funds Therefore and For Other Purposes)

- d) RA 7279 or the Urban Development and Housing Act (UDHA), Section 39 also mandates the formulation of development plans by LGUs for more rational and balanced development of settlements, residential areas, and socialized housing
- e) RA 8371 or the Indigenous People Rights Act (IPRA) (An Act to Recognize, Protect and Promote the Rights of Indigenous Cultural Communities/Indigenous People, Creating a National Commission of Indigenous People, Establishing Implementing Mechanisms, Appropriating Funds Therefor, and for Other Purposes)
- f) RA 9184 or the Philippine Procurement Law (An Act Providing for the Modernization, Standardization, and Regulation of the Procurement Activities of the Government and for Other Purposes)
- g) RA. 4846 (An Act to Repeal RA 3874 and to Provide for the Protection and Preservation of Cultural Properties (June 18, 1966) and amended by PD 374 (January 10, 1974)
- h) RA 9593 or the Tourism Act of the Philippines. (Section 37) LGUs, in consultation with stakeholders, are encouraged to utilize their powers to ensure the preparation and implementation of a tourism development plan (that integrates zoning, land use, infrastructure development, etc.). (Section 61, Development Planning) Each application for designation as a Tourism Enterprise Zone shall be accompanied by a development plan (consistent with the principles of economic, cultural, and environmentally sustainable tourism development).

Although there are still a number of policies related to the preparation of land use plans, these are needed to be fully integrated into the preparation of land use plans as they affect the policy areas (production, protection, infrastructure, and settlement) being safeguarded and harmoniously integrated into the land use planning activities.

Aside from the abovementioned laws, there are also large-scale planning documents linked to the preparation of land use plans. These plans showed the vertical linkages of physical plans from the national level down to the actual comprehensive land use plans at the local level. These planning documents include the following:

The National Framework for Physical Planning (NFPP) 2001-2030. This national plan evolved as a response to an earlier presidential directive "to formulate an integrated national land use policy agenda that would guide the allocation, utilization, development and management of the country's physical resources" (NFPP, p.3). The NFPP is a planning document that presents the overall framework for the planned allocation, use, and management of the country's land and other physical resources at the national and sub-national levels (NFPP). It indicates broad spatial directions and development guidelines on the four major land

use policy areas: settlements development, production land use, protection land use, and infrastructure development (HLURB Vol. 1).

As local counterparts, there are the *Regional Physical Framework Plans (RPFs)*, *Provincial Development and Physical Framework Plans (PDPFPs)*, along with the *LGUs' Comprehensive Land Use Plans (CLUPs)*, which cover the physical development of their respective territories, and shall be consistent with the National Physical Framework Plan. (HLURB Vol. 1).

- a) *Regional Physical Framework Plan*. This physical planning document links the NFPF with the PDPFP and the CLUPs. This planning document provides the broad principles and policies of four land uses and the regional spatial strategy.
- b) *Provincial Development and Physical Framework Plan*. This planning document addresses the disconnection between spatial and sectoral factors and between medium and long-term concerns. It contains the long-term vision of the province. It identifies development goals, strategies, objectives/targets, and corresponding PPAs, which are primary inputs to provincial investment programming and subsequent budgeting and plan implementation.
- c) *Comprehensive Land Use Plan*. It refers to a document embodying specific proposals for guiding and regulating the growth and development of a city or municipality. It is comprehensive because it considers all sectors significant in the development process, i.e., demography, socio-economic, infrastructure and utilities, land use, and local administration, within the territorial jurisdiction.

While the higher-level framework plans are best indicative or recommendatory only, lower-level ones should reflect the structural organization and policy proposals embodied in the NFPF (Serote, 2008). Bottom-up-wise, the local development plan approved by the *Sanggunian* (English: Legislative Body) shall, nevertheless, be integrated into the development plan of the next higher LDC (Serote, 2008). Inasmuch as, there is a need to utilize the regulatory powers of the LGU to enforce the national land use policies pertaining to the four land use categories of settlements, protection, production, and infrastructure support areas mentioned earlier (Serote, 2008).

In view of the above-mentioned principles and objectives, formulation, evaluation/approval, and monitoring of the LUP derive their legal bases as discussed below:

CLUP Formulation. The formulation of CLUPs, along with the Comprehensive Development Plans (CDPs), falls under the mandate of RA 7160. Specifically, Section 20.c states that “The local government units shall, in conformity with existing laws, continue to prepare their respective comprehensive land use plans enacted through zoning ordinances which shall be the primary and dominant bases for the future use of land resources:

Provided, That the requirements for food production, human settlements, and industrial expansion shall be taken into consideration in the preparation of such plans.”

Evaluation/Approval of CLUPs. EO 72 (Providing for the Preparation and Implementation of the Comprehensive Land Use Plans of Local Government Units Pursuant to the Local Government Code of 1991 and Other Pertinent Laws) delineates the power and responsibilities of the LGUs and the HLURB in the preparation and implementation of comprehensive land use plans under a decentralized framework of local governance. More specifically, Section 2 (Plan review and approval) of said EO devolves the powers of the HLURB to review and approve the comprehensive land use plans of component cities and municipalities to the province, and such powers shall be exercised by the *Sangguniang Panlalawigan* (English: Provincial Board).

Monitoring of the CLUPs. Moreover, EO 72 also empowers the HLURB to monitor “...changes in the actual use of land resources; and, the implementation of comprehensive land use plans by LGUs with a view to ensuring compliance with national policies, standards and guidelines....”

5.2.3 Components of the System

Scope of the System. A land use plan is the systematic and organized presentation of an LGU’s strategic vision, objectives, and directions, which, after an iterative process, are converted into a physical and spatial dimension (HLURB Resolution No. 908, series of 2013). Loosely, all land and waters within an LGU jurisdiction are generally subjected to land use planning. To be more specific about it, a land use plan starts from the uplands (or forests) -to-lowlands-to-coastal ecosystems of the watershed/sub-watershed system covering both public and private lands where the LGU is located (HLURB Resolution No. 908, series of 2013).

The systematization of the land use planning approach can be delved in terms of the four policy areas where LUP works. These are the protection, production, settlements, and infrastructure themes of the space where LGUs work.

Protection Areas. These are parts of the land that need to be conserved and protected to continuously provide the basic and survival materials for sustained human development. The notion of sustainable development is integral in this aspect as the conservation and protection of areas are for the present and future generations to come. These are the areas providing salient life support system for the land, which includes the NIPAS and non-NIPAS areas, protected agricultural areas, and environmentally constrained areas.

Production Areas. These are known as the "space for making a living," the areas for agriculture (croplands, fisheries, livestock, poultry), industrial, commercial, tourism, etc. These areas are highly dependent on the interaction of the protection areas providing the

significant resources and the settlement areas where the actual labor force for making a living lives.

Settlement Areas. These areas include those "spaces for living" where human settlements grow in harmonious relationship with the protection areas. Settlement areas are places including the urban (town centers), rural (upland, lowland, coastal communities), and indigenous peoples communities.

Infrastructure Areas. These areas are also known as the "exchange spaces." These areas link the different spaces together through transport networks, social infrastructures, economic infrastructures, and other administrative support. Without the linkage that these spaces create, the harmonious and sustained growth and development of other spaces will not be assured.

Essentially, these are the coverage of the land use planning system in the Philippines, usually covering municipalities or cities as administrative boundaries.

The Land Use Planning Process. HLURB prescribes a 12-step process leading to the completion of the CLUP and its principal regulatory mechanism— the zoning ordinance.

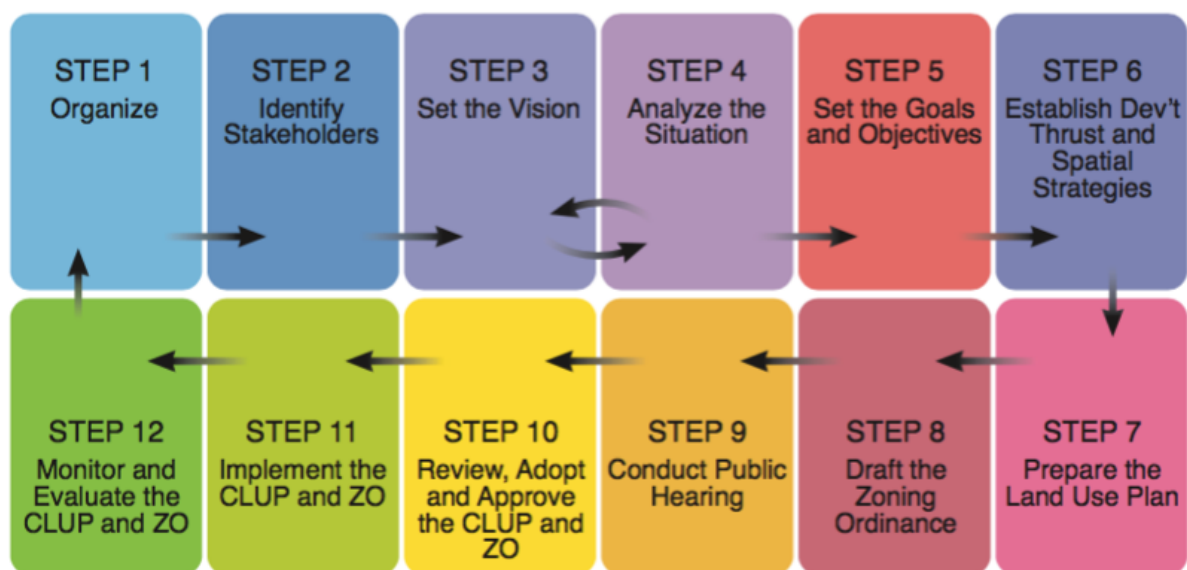


Figure 5. The Comprehensive Land Use Plan Process
Source: HLURB, 2013

Step 1: Getting organized is an important first step to take before doing the actual plan preparation activities. Anticipating and preparing for the resources that will be needed for the planning activities will lead to the smooth implementation of accomplishment of planning outputs in time.

Step 2: Public participation is a fundamental part of the planning process. It ensures the involvement of all stakeholders to enhance awareness, raise the quality of the plan, and increase

the likelihood of the plan's acceptability and success of implementation. Stakeholder participation has two essential and related components: information sharing between the LGU and the citizenry, and active involvement of stakeholders in identifying issues, evaluating options, and formulating strategies.

Step 3: The third step in the land use planning process is to establish the vision. This involves defining the desired future for the city or municipality. The vision is a powerful tool that provides direction and momentum for the entire planning process, as well as for achieving a shared development objective. Moreover, it serves as a guide for the subsequent stages of the planning process, ensuring that all actions and decisions are aligned with the vision. This activity may be done interchangeably with Step 4: Analyze the Situation.

Step 4: Analyzing the situation involves both technical and participatory methods to identify the issues, potentials, and future development needs of the city/municipality. The technical assessment is based on factual data from surveys and official records, while participatory assessment involves consultations with communities and stakeholders to gather their needs and suggestions. The results of this step may affect the prioritization of stakeholders and the setting of the strategic vision (Step 3).

Step 5: Formulating goals and objectives with community consensus is crucial for achieving the city/municipality's vision. Participatory goal setting ensures engagement of all sectors and shared ownership of the plan. Goals should address weaknesses, build on strengths, and take advantage of opportunities identified in the situational analysis.

Step 6: This step involves translating the city/municipality's vision into physical and development terms. This includes identifying preferred land uses, spatial character, and development strategies to achieve the goals. It is a critical step in determining the future development of the area and involves choosing development alternatives that serve as a framework for the land use plan, using inputs from sectoral, thematic, and area studies.

Step 7: This focuses the preparation of the Land Use Plan, which translates the city/municipality's vision, goals, objectives, development thrust, and spatial strategies into a plan that details the allocation and detailing of land uses. The Land Use Plan also integrates mandatory elements such as transportation networks, public facilities, economic development, ecologically critical areas, and natural hazards. This step aims to reconcile land use conflicts and make necessary adjustments in the matrix of relationships.

Step 8: This is the translation of the Land Use Plan into an integrated Zoning Ordinance. This is achieved through the local enactment of an ordinance that contains regulations on the allowed uses in each zone or district, as well as district regulations and implementing schemes.

Step 9: This step provides a systematic approach to consensus building on the final draft of the CLUP/ZO prior to its submission for approval. This involves a three-stage process: public

display and information dissemination, the conduct of public hearing/consultation, and the refinement of the CLUP/ZO because of the public consultation.

Step 10: This step involves conducting a comprehensive review, adoption, and approval/ratification of the CLUP/ZO. It is crucial to review the plan in terms of its consistency with national, regional, and other relevant plans. This step aims to legitimize the CLUP and ZO for implementation by obtaining the necessary approvals from the appropriate authorities. The review process may involve public consultations, stakeholder engagement, and expert assessments to ensure the plan meets the standards and requirements set by the concerned agencies. Once approved and ratified, the CLUP and ZO become the official land use plan and zoning regulations of the city/municipality.

Step 11: Implementing the CLUP requires resources, institutional structures, and procedures, among others, to be realized. The Local Government Code allows flexibility for LGUs to design and implement their own organizational structure and staffing pattern according to their vision, goals, and objectives. The LGU may enact other measures and instruments to implement the CLUP/ZO realistically. These measures and instruments are laid out in this section, with the understanding that each LGU must assess what is appropriate for their particular situation. Ultimately, the success of the plan implementation hinges on the LGU's creativity in governance.

Step 12: This step of the process involves the identification and establishment of monitoring, review, and evaluation (MRE) systems for the implementation of the CLUP and ZO. The establishment of an effective MRE system is crucial in tracking the progress made towards achieving the vision set out in the CLUP. It serves as a guide for the LGU in focusing their development efforts and interventions towards the realization of their goals and objectives.

Implementing Institutions, Structures, and Roles. The CLUP preparation as per RA 7160 states that each local government unit must develop a comprehensive multi-sectoral development plan initiated by a local development council and approved by its *Sanggunian*.

The local authority for the preparation of the CLUP is the local development councils headed by the mayors and composed of the following members:

- (1) All *Punong Barangays* (English: Barangay Chairperson) in the city or municipality;
- (2) The chairman of the committee on appropriations of the *Sangguniang Panlungsod* or *Sangguniang Bayan* (English: City or Municipal Legislative Body) concerned;
- (3) The congressman or his representative; and

- (4) Representatives of nongovernmental organizations operating in the city or municipality, as the case may be, who shall constitute not less than one-fourth of the members of the fully organized council.

Also part of the local development council is the development sector representatives of the local offices operating in the LGU. This representation is enhanced by the presence of the local sector representatives from the five development sectors (social, economic, environment, infrastructure, and institutions).

LUP and local decision-making process: Coordination, Control, and Authorization. In the principle of decentralization, the LUP process is designed to have an independent and decentralized character as mandated by the law.

The 12-step process of the HLURB outlines the tasks and levels of involvement of LGUs, establishing coordination and control mechanisms for the system. This ensures that LGUs are firmly established in the coordination process.

Legislatively, the local *Sanggunian* plays a crucial role in the LUP process as it is responsible for approving and authorizing the output. This regulatory mechanism serves to authorize what can be allowed in the land use of the locality, providing a long-term framework for decision-making.

5.3 Probing the Interface of EIA and Land Use Planning: Similarities, Differences, and Areas of Complementation

The environmental impact assessment system and land use planning are two separate themes in the management of the natural environment. Although these themes follow a separate set of systems or methodologies, there still exist areas of complementation, similarities, and differences.

Through the various system factors for EIA and LUP, deeper analysis can be made to pinpoint the areas of similarities and differences, thus enabling for better understanding of the relationships of the two systems.

Table 7. Similarities and Differences Between EIA and Land Use Planning System

System Elements	EIA	LUP
Policy Base	<ul style="list-style-type: none"> ▪ PD 1586, DENR Admin. Orders ▪ Mandated process 	<ul style="list-style-type: none"> ▪ Philippines Constitution, local government unit, national guidelines ▪ State principle on rational use of land resources ▪ Guidelines on process

System Elements	EIA	LUP
Objectives	<ul style="list-style-type: none"> ▪ Assess environmental impacts of a specific project, recommend appropriate mitigation measures, promote sustainable development through protection and wise use of ENR 	<ul style="list-style-type: none"> ▪ Promote efficient and best use of land, resolve land use conflicts and conserve ecological resources for sustainable development
Scope of Application	<ul style="list-style-type: none"> ▪ Project-focused ▪ Environmentally critical projects and projects in environmentally critical areas ▪ Depends on the physical area covered 	<ul style="list-style-type: none"> ▪ All land and waters within LGU jurisdiction
Process or Methodology	<ul style="list-style-type: none"> ▪ Rational ▪ Science-based ▪ Consultative 	<ul style="list-style-type: none"> ▪ Incremental ▪ Step-by-step, developmental ▪ Vision-oriented ▪ Participatory
Institutional Arrangements		<ul style="list-style-type: none"> ▪ LGU ▪ National (regional) and local stakeholders
Outputs	<ul style="list-style-type: none"> ▪ Environmental conditions, ▪ Mitigation plan ▪ Geohazard information 	<ul style="list-style-type: none"> ▪ LUP ▪ Zoning Regulations

Both the Environmental Impact Assessment and the Land Use Plan are important planning documents in the development of Philippine communities. Both of which are required by local governments of the Philippines to initiate any land use development (e.g., residential, industrial, infrastructural, etc.). Practices of LUP and EIA in the Philippines are evaluated using various system elements (e.g., policy base, objectives, the scope of application, methodology, institutional arrangements, and outputs).

Policy Base The EIA and LUP were made under the Philippine laws and orders. EIA's baseline policies consisted of various laws such as P.D. 1151 (Philippine Environmental Policy; PD 1586 (Establishment of Philippine Environmental Impact Statement System (PEISS) led by the National Environmental Protection Council (NEPC); P.P. 2146 or the proclamation of certain types of projects as environmentally critical; A.O. 42 or the Rationalizing the implementation of the Philippine EIS System led by the Department of Environment and Natural Resources.

On the other hand, LUP was based on the Philippine constitution and integrated into local government units and national guidelines. Both of which are being

governed by the national government of the Philippines down to the smallest unit in the community, the barangay.

Although the EIA and LUP came from entirely different policy backgrounds, both the land use planning process and the EIA system acknowledged the existence and importance of the other system. In the Philippine Land Use planning system, based on the policy where it arose, the EIA system has been recognized as one of the tools that assured better management of environment-related projects — allocation of land to its best use is assured.

Objectives Mainly, both the plan and assessment aim to rationalize the use of land and maintain it sustainably. Generally, EIA is an interdisciplinary analysis of the effects of development projects that came from the public and private sector's actions. Specifically, EIA aims to:

- 1). Assess environmental impacts of a specific project;
- 2) Recommend appropriate mitigation measures;
- 3) Promote sustainable development through protection and wise use of the environment and natural resources.

On the other hand, LUP in the Philippines focuses more on the use of land and water jurisdictions and has the following objectives:

- 1) Promote the efficient use or utilization, acquisition, and disposition of land, ensuring the highest use of the resource;
- 2) Harmonize discussions and activities of both private and public sectors in relation to the management and use of lands;
- 3) Reconcile the conflicts and proposals regarding land use between and among the individuals, private and government entities relative to the present and future need of land;
- 4) Promote desirable patterns of land use to prevent wasteful development and minimize the cost of public infrastructure and utilities and other social services; and
- 5) Preserve areas of ecological, aesthetic, historical, and cultural significance.

In terms of system objectives, EIA is more specific in assessing the impacts of a project, while the LUP system is geared towards balancing the many-fold uses of land to the society. In this case, it is arguably sensible to note that the EIA system works on the specifics of the LUP system to safeguard the best use of the natural resources base. It assures that no significant damage to the natural environment will result from human activities by controlling the actual use and, at the same time, mitigating the inevitable extractive and disruptive activities that the project implements

Scope of

Application Based on the objectives of EIA and LUP, it can be seen that both represent the conservation and proper utilization of lands and water resources. However, EIA deals explicitly with a specific project or program done by a public or private sector and suggests the mitigating actions that have to be done. On the other hand, LUP deals with the provision of the best and most efficient use of land under the jurisdiction of a community.

The development focus of EIA and LUP systems varies. Development projects, especially those listed with potential environmental impacts, are the focus of the EIA system. In contrast, the LUP system sees all human activities affecting the use of land and water resources within the administrative bounds of a city or municipality as its scope. Here it is clear that the LUP system tries to work out the general harmony of human activities, be it a simple regular activity or a large-scale project, to the best possible balance of use and conservation of resources. However, the EIA system, on its specific methods, addresses the bits of interactions in the whole project's system of implementation to minimize and, to the greater extent, eliminate the damaging aspects of the conduct of the project up to its implementation and mitigate the undesired and unintended impacts of the project operation to the natural environment.

Process or

Methodology The process between the two planning techniques (EIA and LUP) involves a systematic approach. The EIA involves various steps, which include the following:

- 1) Screening – determines whether the project requires an EIA as well as the level of assessment to be done;
- 2) Scoping – identifies the key issues and impacts of the project to the communities; also, this phase determines the scope and time-frame of the project;
- 3) Impact analysis – data and baseline information gathering as well as identification and prediction of the environmental and social impact of the project or program;
- 4) Mitigation – recommendation of actions to undertake to potentially avoid the adverse environmental consequences of the development activity or project;
- 5) Reporting – includes the presentation of the EIA to the Environmental Management Bureau (EMB);
- 6) Review of EIA – examines the effectiveness of the current EIA report that has been done and provides the information needed for the decision-making; and

- 7) Project Implementation and Monitoring – the last stage and comes when the project is commissioned. In addition, at this stage, it is checked and ensured that the project's impact does not go out of the legal standards, implementation, and mitigation measures as described in the EIA report (UST, 2011).

EIA is widely considered an offspring of the rational planning model, which advocates for a systematic, logical, and evidence-based approach to decision-making. This is reflected in EIA's reliance on scientific data, baseline studies, and predictive assessments to evaluate the environmental consequences of a proposed action. It is inherently criteria-driven and compliance-focused, mandating adherence to specific environmental standards and regulatory requirements to inform clear decisions on project approval or modification.

In the case of LUP, there is no general process for the land use plan in the Philippines. However, specific land use planning documents could provide a process. One of the planning documents used in all of the municipalities in the Philippines is the Comprehensive Land Use Plan (CLUP). The CLUP, as a planning process, consists of 12 steps that clearly show how land use planning is being done in the Philippines. This process provides insights to the planning team to create a systematic and structured land use plan. Moreover, this kind of process is vision-oriented (HLURB).

In contrast to EIA, land use planning often exemplifies an incremental planning model. This approach acknowledges the complex and dynamic nature of land development, where decisions are made in smaller, adaptive steps rather than a singular, overarching master plan. LUP processes are typically flexible, participatory, and developmental in nature, evolving through stages such as visioning, situational analysis, plan formulation, implementation, and monitoring, allowing for adjustments based on changing conditions and stakeholder input.

While both EIA and LUP are crucial for sustainable development, their differing underlying models can lead to both compatibility and friction. EIA's rigorous, data-driven assessment can provide essential environmental insights and specific criteria for LUP's broader strategic framework. Conversely, LUP's long-term vision and adaptive nature can provide the necessary contextual understanding for individual projects subject to EIA. However, potential mismatches in assumptions regarding data completeness, timelines, and implementation can arise. EIA often assumes comprehensive data for specific projects at a given point, while LUP deals with broader, often less precise information over longer temporal and spatial scales. This can lead to difficulties

in directly applying project-level EIA tools to the more fluid and iterative stages of strategic land use planning.

To bridge this gap and foster greater harmonization, rational assessments (like those employed in EIA) can be embedded into the step-by-step structure of LUP. This could involve:

- Integrating evidence-based evaluations during the situational analysis phase of CLUP development to establish a robust environmental baseline and identify critical sensitivities.
- Utilizing scenario-building approaches during plan formulation to proactively assess the potential long-term and cumulative environmental implications of different land use alternatives or policy choices, thereby applying principles of Strategic Environmental Assessment (SEA) at a more anticipatory level.
- Ensuring that environmental criteria and standards, typically central to EIA, inform the zoning regulations and implementation guidelines derived from the CLUP.

Institutional

Arrangements Various governing bodies are entitled to the creation of the local development plans in the Philippines. In EIA, it is usually done by an expert or a consultant hired by the officials of the project or program seeking an assessment. Since it is a requirement in the Philippines for a program or a project to continue, the Department of Environment and Natural Resources is one of the lead agencies that issue the certificate as an approval for the project or program to proceed.

On the other hand, the LUP in the Philippines is governed by the lead agencies working under the local government of the country. Various sectors—private and public—are involved in the creation of land use plans.

The methodological approach, in general, can be seen as both the systems of EIA and LUP striving to be as comprehensive as possible. The EIA system tries to be as exhaustive as possible about the possible outcome of the project from inception up to the actual operations. The notion of comprehensiveness, in this sense, results from being science-based and rational, given the complex nature of projects and their consequent impacts. For the LUP system, the aspect of comprehensiveness deals with the components it tries to integrate, which include, at the minimum, the development sectors of economic, environmental, social, infrastructure, and institutions.

Both the EIA and the LUP systems integrate the notion of community participation in their systems. Since these systems are geared towards community participation from the public inputs and their general acceptance of the results and their involvement in the decision-making process, it is understood that participation of the public, or the major stakeholders at least, is integral in the process.

The major actors in the EIA system include both the sector that applies for the environmental compliance certificate (ECC) and the DENR-EMB, which directly deals with the application procedure, the revisions in the application, the specifications, and the general review and approval of the project concerned. The other sectors involved in the EIA, including the affected community and the LGU concerned, are dealt with by these two bodies, primarily acting in the application process in the EIA system. Since the EIA system works on the project scope, the stakeholders involved in the process are very minimal compared to the LUP system, wherein the planning process entails the entirety of the municipality or city and representations at the provincial and district level, which is the concern in terms of the review and approval of the plan. The commonality is the involvement of the LGU in both systems. Although not as huge as the tasks or role at hand for the LUP system, the LGU in the EIA system facilitates and provides inputs, especially regarding the spatial concerns where the project will be sited. On the other hand, the LUP system fully operates at the LGU concern; EIAs of several development projects are among the many considerations the planning team needs to address.

Outputs Primarily, the output of the EIA consists of a document showing an assessment of how the program or project will affect the environment and the strategies and mitigating actions that have to be done to lessen the adverse effects. Moreover, other outputs include environmental condition profile, geohazard information, and mitigation plan.

On the other hand, the output of the LUP includes the various zoning and land use regulations since the LUP concerns more about the jurisdictions and the management of land for resource use. Other specific output includes the CLUP, FLUP, etc.

5.3.1 Relationship Between EIA and Land Use Planning System

The relationships between the EIA and the land use planning system are as follows:

- No explicit link between the two systems
- Both are governed by “guidelines” in terms of process

- EIA is more used for regulation, so is the Zoning Ordinance
- Both systems have in-place mechanisms for impact assessment
- EIA is pursued by the national government, whereas LUP by local governments
- Common planning parameters are nationally legislated (standards on waste management and pollution control, and access to land resources owned by the national government)
- On climate change, EIA focuses on project impacts on GHG emission and other hazardous substances that can compromise the quality and sustainability of ENR
- Neither system has a mechanism for measuring cumulative impacts of development or climate change impacts on communities

A critical distinction within these relationships concerns the assessment of environmental risks. Traditionally, the Philippine Environmental Impact Assessment (PEIS) system is designed to evaluate the effects of projects on the environment, focusing on impacts such as greenhouse gas emissions and the release of hazardous substances that could compromise the quality and sustainability of natural resources. This core mandate means EIA primarily functions as a tool for managing project-induced environmental degradation.

However, a significant challenge arises when considering disaster risks, which represent the effects of the environment (i.e., natural hazards and climate change impacts) on projects, communities, and development plans. While Comprehensive Land Use Plans (CLUPs) are inherently tasked with addressing these vulnerabilities and guiding safe land use, the standard project-based EIA process does not naturally incorporate this reciprocal assessment.

In the Philippines, practices are evolving to bridge this gap. There is a growing emphasis on incorporating Climate Change Adaptation (CCA) and Disaster Risk Reduction and Management (DRRM) into planning processes. This includes the use of tools like Climate and Disaster Risk Assessment (CDRA) by Local Government Units (LGUs). CDRA utilizes historical data on climate-related hazards (e.g., flooding, landslides) and vulnerability analyses to inform land use decisions. While not formally mandated within the typical EIA for specific projects, outputs from CDRA studies can and should inform project siting and design, thereby indirectly influencing the project's vulnerability to environmental hazards.

Furthermore, effectively addressing climate change necessitates integrating a temporal dimension into environmental assessments, moving beyond a current snapshot to account for changing climatic trends over long periods. This involves considering shifts in rainfall patterns, temperature increases, changes in typhoon frequency and intensity, and sea-level rise projections. While EIA frameworks are often static, primarily assessing impacts at a project's inception and during its operational phase, the dynamic nature of climate change requires a more forward-looking approach.

For EIA to adequately inform strategic land use planning, it must incorporate historical climate data (e.g., past 5-10 years or more) and future climate projections into its baseline and impact prediction stages. This means integrating temporal layers into the impact assessment, allowing for the evaluation of a project's long-term environmental resilience and its contribution to or vulnerability within changing climate scenarios. The challenge lies in enhancing existing EIA tools and methodologies to account for these future climate scenarios and the cumulative changes that unfold over time, moving towards a more dynamic and adaptive assessment framework that can truly inform sustainable and resilient land use decisions.

A significant practical challenge in applying the principles of the rational model to environmental assessments in the Philippine context, particularly concerning long-term planning and climate trends, is data availability. The ideal of the rational model assumes comprehensive and reliable datasets for thorough analysis and optimal decision-making. However, the absence or scarcity of long-term and spatially detailed datasets, such as historical climate records (e.g., rainfall, temperature trends, typhoon frequencies over several years) or robust land use change data, frequently undermines this principle.

This data limitation can severely constrain assessment methods, leading to incomplete environmental baselines, uncertain impact predictions, and ultimately, an increased risk in assessment and decision-making. When critical information is missing, the ability to accurately evaluate environmental impacts or project resilience to future hazards is compromised. To mitigate this, approaches to data collection need to be adaptive. Primary data collection can serve as a vital alternative or supplement, enabling the gathering of specific, localized, or recent temporal information. This might include conducting community surveys to document local experiences with typhoons or historical flooding over the last five years, or analyzing recent land use changes through direct observation or recent satellite imagery. Supplementing quantitative gaps with qualitative data can also provide crucial insights into environmental conditions and community vulnerabilities. Regardless of data limitations, it is imperative that key disaster risk parameters, such as those related to landslides, flooding, and typhoons, are systematically integrated into baseline studies and impact prediction within EIA, leveraging all available data, whether primary or secondary, and even anecdotal evidence where scientifically sound.

Despite these efforts, neither the traditional project-level EIA nor the CLUP currently possesses a fully integrated and robust mechanism for comprehensively measuring both the cumulative impacts of development and the reciprocal impacts of climate change and disaster risks on communities and infrastructure over the long term. This highlights a need for policies and practices that more explicitly require the consideration of climate and disaster vulnerability assessments within the broader environmental planning framework, ensuring that projects are not only environmentally sound but also resilient to future hazards.

5.3.2 Possible Areas for Integration by Systems Components

Four possible areas for integration by system components are policy, institutional, process, and outputs. Analysis indicates that significant opportunities exist within these domains to foster a more synergistic relationship between EIA and LUP, encompassing the harmonization of legislative frameworks, fostering inter-agency collaboration, streamlining operational procedures, and standardizing informational outputs. For instance, at the policy level, integration could resolve ambiguities arising from separate mandates, while at the institutional level, it promises more coordinated efforts in addressing environmental challenges. Process integration offers the potential for streamlined workflows and reduced duplication, and output integration ensures consistent and comprehensive information for decision-making. The specific components and detailed pathways for these integrations are summarized in Chapter 8 as key findings and form the basis for actionable recommendations.

5.3.3 Preconditions for Integrating EIA and Land Use Planning Based on System Components

Prior to successfully integrating the system components of EIA and LUP, several crucial preconditions must be established. These foundational requirements are not merely theoretical but represent practical necessities that permeate all levels of policy, institutional structures, processes, and outputs. At the policy level, preconditions involve aligning diverse legal mandates and ensuring consistent legislative support for integrated planning. Institutionally, it necessitates building technical capacities within relevant agencies and defining clear collaborative mechanisms among stakeholders. For processes, preconditions include harmonizing methodologies and developing shared approaches to data collection and impact assessment. Lastly, regarding outputs, it requires standardizing information formats and establishing integrated database systems to ensure effective communication and utilization of findings across both domains. Addressing these preconditions is essential for creating an enabling environment where the proposed integrations can be effectively implemented and sustained, thereby enhancing the overall effectiveness of environmental governance. A comprehensive list of these necessary preconditions is detailed in Chapter 8.

Chapter 6: Climate Adaptive Residential Development: Case Study of Two Cities

6.1 Introduction

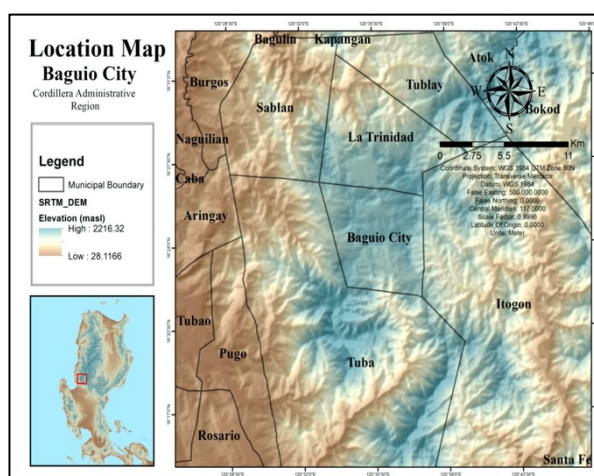
Cities are among the places of urbanity. The concentration of population and centralization of different services play a crucial role in determining the vulnerability and adaptation of an area to different environmental impacts. Baguio and Sta. Rosa cities in the Philippines play a key role in this study.

6.2 Case Study Area 1: Baguio City

The city of Baguio is among the oldest cities in the Philippines. Known as the City of Pines and the Summer Capital of the Philippines, the city is lying on the plateau of the Cordilleras at an altitude of 1,400 MASL. It has a land area of 57.51 km² and a population of 345,366 (PSA Census, 2015), which is the only Highly Urbanized City (HUC) in the region. Baguio City is also a regional capital and one of the flourishing highly urban areas in the Philippines. The city's population density is 6,005 persons/km², and it has an annual average population growth rate of 1.54 (PSA Census, 2015).

Baguio City is bounded on the north by the municipality of La Trinidad, on the east by the municipality of Itogon, and the municipality Tuba on the southwestern portion, all in the province of Benguet. The city has a total of 129 urban barangays.

It has a temperature of 8 - 10°C lower than in the lowlands. Baguio City's cool climate attracts settlers such that the whole mountainsides have developed into housing projects. With its limited space, high-rise structures are dominating Baguio City's landscape. This poses a significant risk to its inhabitants due to its steep terrain, for being traversed by the northern splay of the Philippine Fault Zone, and for being in a wet region. Baguio City holds the world record for a 24-hour rainfall at 1,200mm (Jennings, 1950). With such a confluence of environmental characteristics, Baguio City is highly prone to landslides (Orense, 2003).

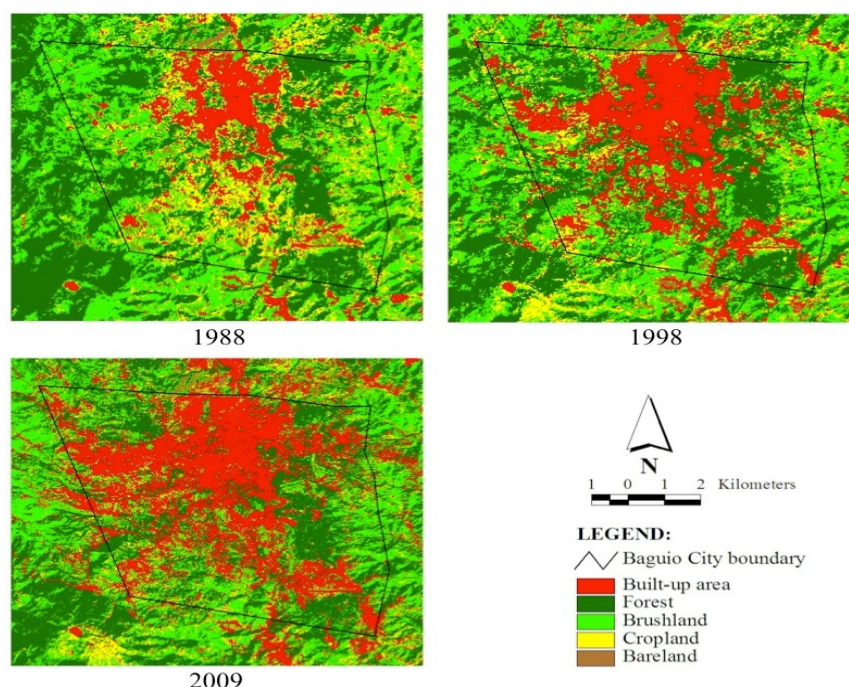


Map 1. Location Map, Baguio City

6.2.1 Development Trends and Spatial Growth

Baguio City's rich urbanization history started as a planned resort city during the American occupation of the Philippines in the early 1900s. The situation only paved the way for the concentration of people in the area. The once planned city for several temporary American settlers and few affluent locals has been changed into its current phase.

The Burnham Plan for Baguio started the rich history and spatial growth for the city. The Plan prepared by Daniel H. Burnham for Baguio is said to be the miniature version of the plan by *L'Enfant of Washington, D.C.* Among its major developments included the construction of Kennon Road that connected Baguio to McArthur Highway, government and building sites, open spaces, parks and parkways, and radial street system. These infrastructure developments paved the way for the continuously increasing concentration of people in the area as induced by the relatively cold climatic condition in Baguio City.



Map 2. Decadal Built-up Map, Baguio City (1988, 1998, 2009)

Source: Baguio City CLUP, 2012

Urbanization, through the continuously growing built-up areas in the city, has been very evident as decades passed. Present problems of Baguio are still being attributed to the limits imposed by the Burnham Plan that was not substantially replanned along the lines with the issues and concerns of the urbanizing Baguio. Firstly, the Plan only considered a maximum population of 2,000. Currently, Baguio serves as home for more than 300,000 people. Next, it failed to incorporate an adequate street system due to the incomplete survey conducted. Finally, there was a heavier emphasis on the city's physical appearance and architectural design than other important aspects like developing facilities for utilities and other support services such as power, water, and communication lines.



Picture 1. Typical Settlements in Baguio City

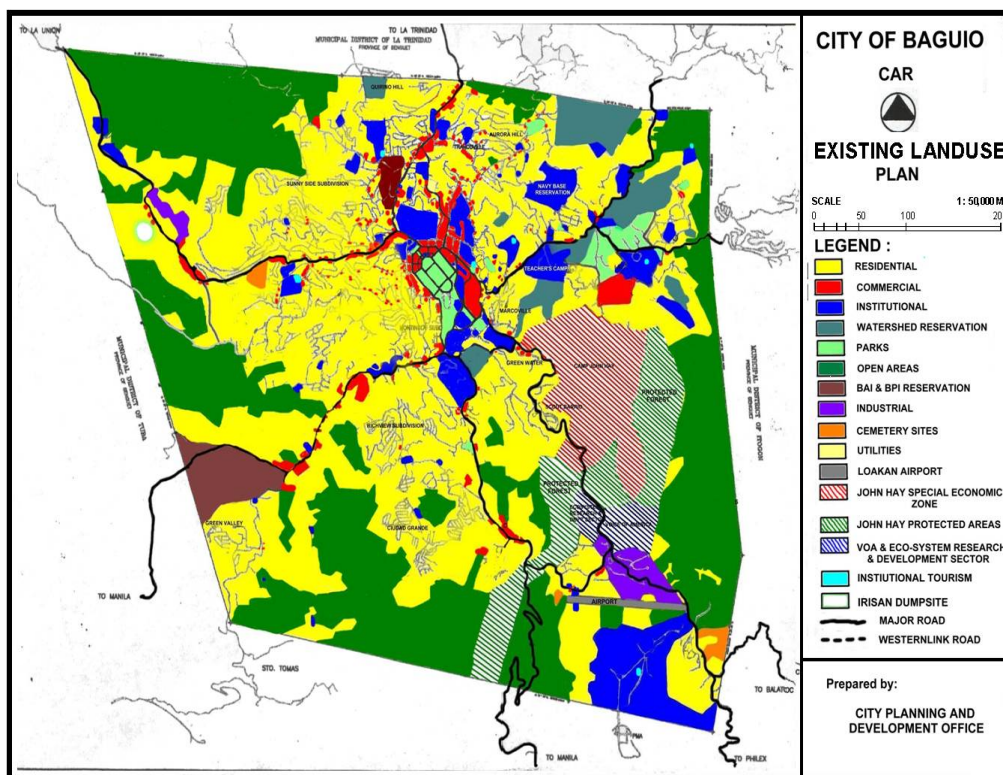
6.2.2 Land Use Planning Institutions, Policy, and Decision-Making Processes and Structures

Baguio City is among the HUCs in the Philippines. The structure for the land use planning for Baguio City is more likely related to the provincial planning level than that of the usual city-level due to the comparable high population that HUCs need to accommodate.

The land use committee working to prepare the city's physical plan is the City Land Use and Development Committee. This is usually composed of the development sectors represented by the different local city departments headed by the City Planning and Development Office (CPDO). As a city with a pronounced indigenous peoples (IPs) group, Baguio City's Local Development Council (LDC) includes a significant representation of the *Igorots* (the local indigenous group in Baguio City); also, it includes representatives from the NGOs, private sector and private organizations (POs). The main areas of concern by the city land use committee are the four policy areas of protection, production, settlements, and infrastructure.

The reviewing committee for the land use plan of the city committee is the Regional Land Use Committee (RLUC) of the Cordillera Administrative Region (CAR). Since Baguio City is a highly urbanized city, the regional office, not the province of Benguet, directly handles the reviewing committee for the land use planning activity. This is also true concerning the approving body for the land use planning activity held by the Baguio City land use committee - Housing and Land Use Regulatory Board (HLURB).

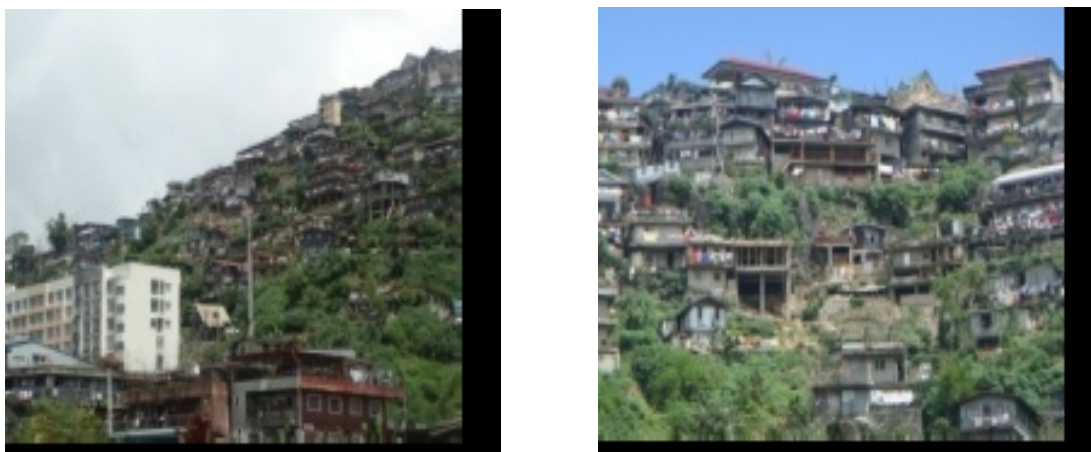
After the successful review and approval of the regional land use committee and the HLURB, respectively, the city council of Baguio or the *Sangguniang Panglunsod* will adopt the land use plan and implement it as a Zoning Ordinance.



Map 3. Existing Land Use Plan, Baguio City
Source: City Planning and Development Office, Baguio City

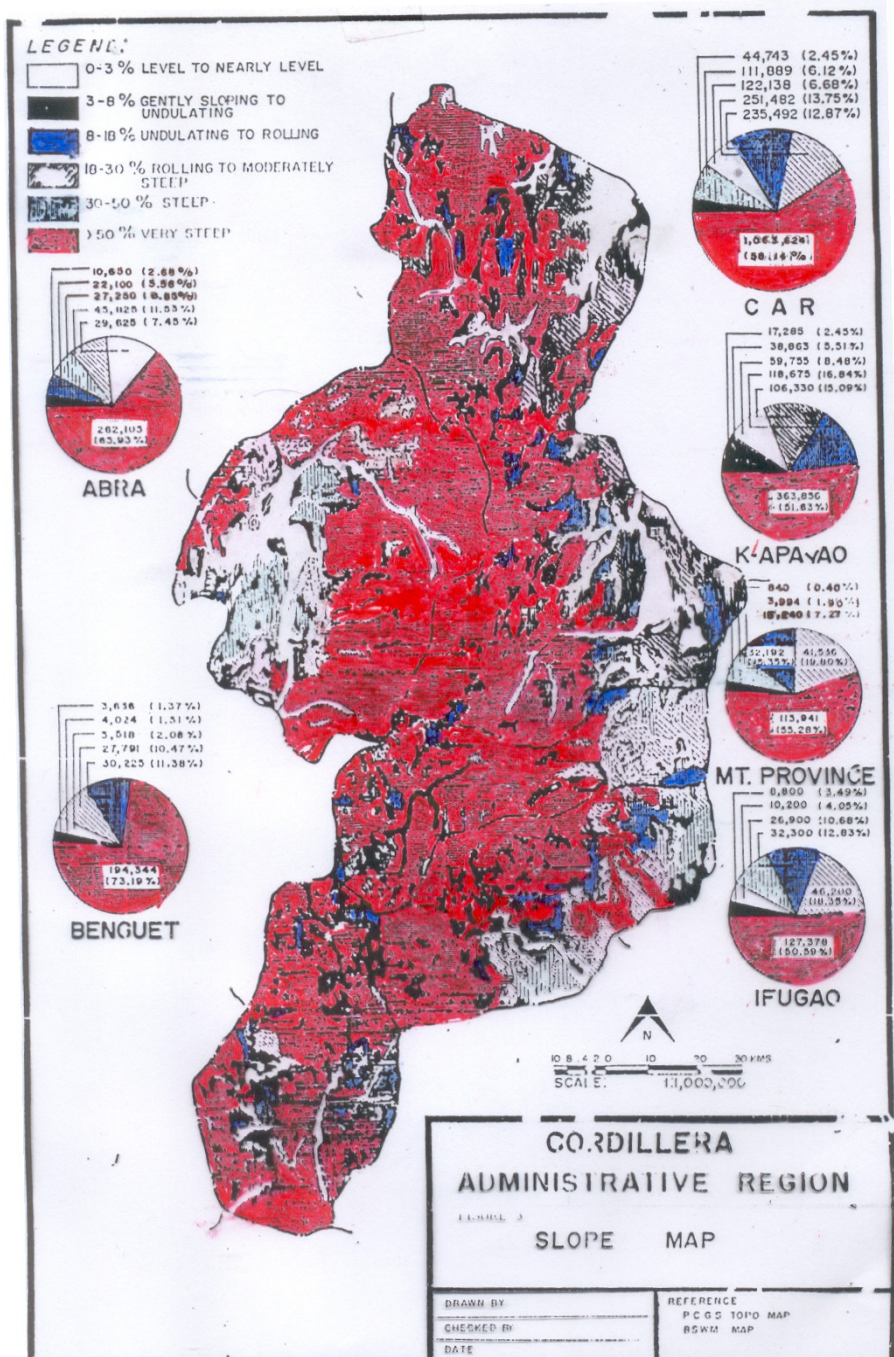
6.2.3 Environmental Considerations in Spatial Planning

Given the increasing challenges in the rapidly urbanizing Baguio City, several concerns added to the innate vulnerabilities of the city — urban sprawl and uncontrolled development, among others. The physical limits of Baguio City's geography show its high vulnerability to landslides. Characteristically, the whole Cordillera region is prone to landslides due to the following: steep slope, removal of vegetation, weakening of previously strong rock by weathering, presence of relict structures, and overloading of slope surfaces by formal and informal infrastructures.



Picture 2. Urban Sprawl along the Slopes of Baguio City (Verzosa, 2009)

Steep Slope. About 90 percent of the region is characterized by steep to very steep slopes. Generally, the steeper the slope, the more liable it is to be unstable and prone to mass movements. With this topographic character, Baguio City is no exception in the occurrence of landslides. Other contributing factors include the soil and subsurface rock formation character, the fault line traversing the region, and the structure built above the topographic slope surface.



Map 4. Slope Map of Cordillera Administrative Region (CAR)
 Source: City Planning and Development Office, Baguio City



Picture 3. Typical Vegetation Site in Baguio City

Removal of Vegetation. Vegetation provides cover that cushions the impact of rain falling on a slope. The trees and other vegetative covers of a surface provide an apparent cohesion to the slope materials. However, due to uncontrolled urbanization in the area, the previously lush forest vegetation of the city has been continuously transformed into agricultural and residential lands to give way to the increasing demands in the rapidly increasing populace settling in the city.

Weakening of previously strong rock by weathering. With lesser vegetation to hold the soil-rock surface system intact, the process of weathering is induced. This natural process is triggered by the changing environmental conditions commonly due to water action. Water saturation of earth materials causes a rise in pore water pressure resulting in weathering and fragmentation of rocks into smaller fragments.



Role of water: saturation of earth materials causes a rise in pore water pressure



Picture 4. Fragmentation of Rocks

Presence of relict structures. Relict pertains to joints (fractures), bedding planes, faults in the surface area. The complex fault system which constitutes the northern splay of the Philippine fault zone has dramatically disturbed the underlying rock formations, thereby reducing their shear resistance. Though these served as passageways for mineralizing solutions, which brought about various mineral deposits the region is noted for, it also altered the host rocks, reducing their weathering resistance. Due to the geologic character of the Cordillera region, the relict structures are a permanent feature of the area, making the subsurface rock formations more susceptible to breakage and weathering.

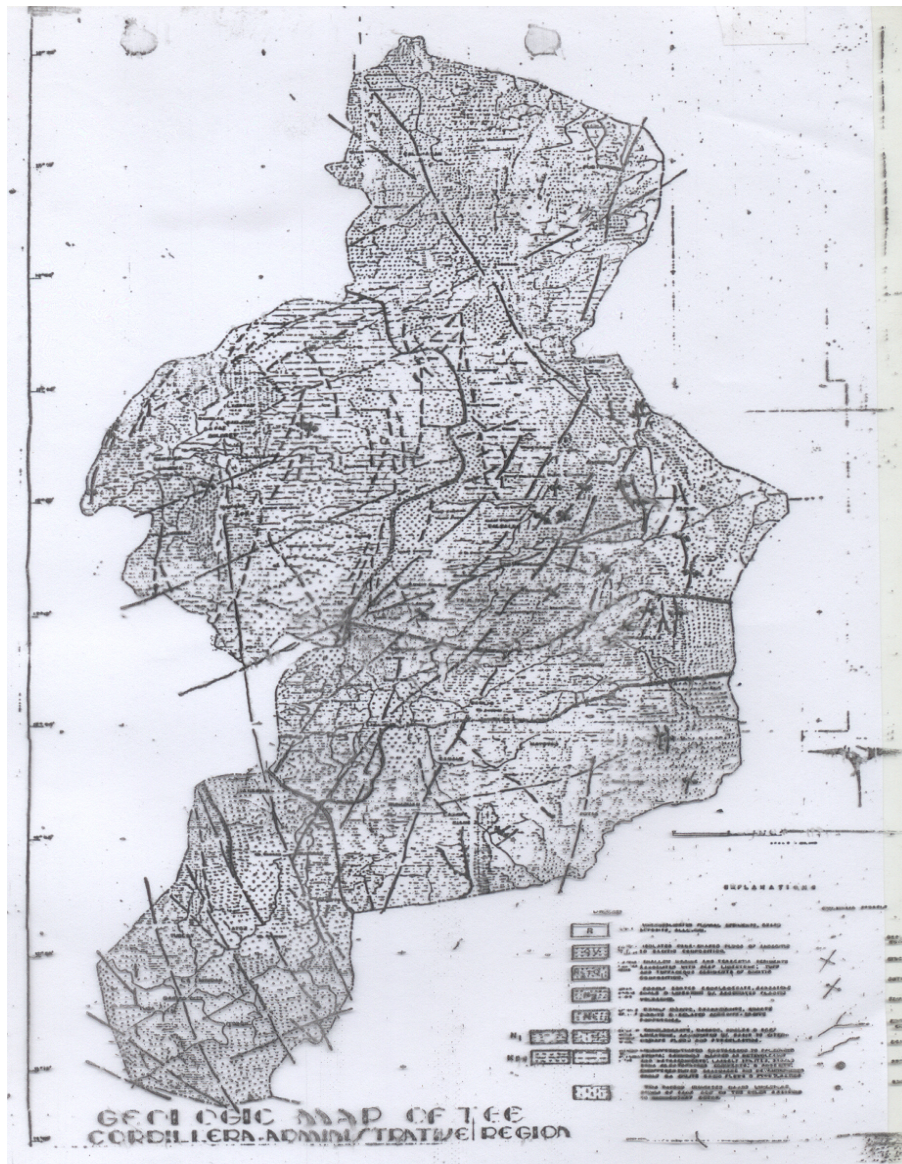
Overloading of slope surfaces by formal and informal infrastructures. Stress on the weight carried by the sloped surfaces of the city adds to its vulnerability for subsidence and surface



Picture 5. Sample photo of improperly built houses in Baguio City

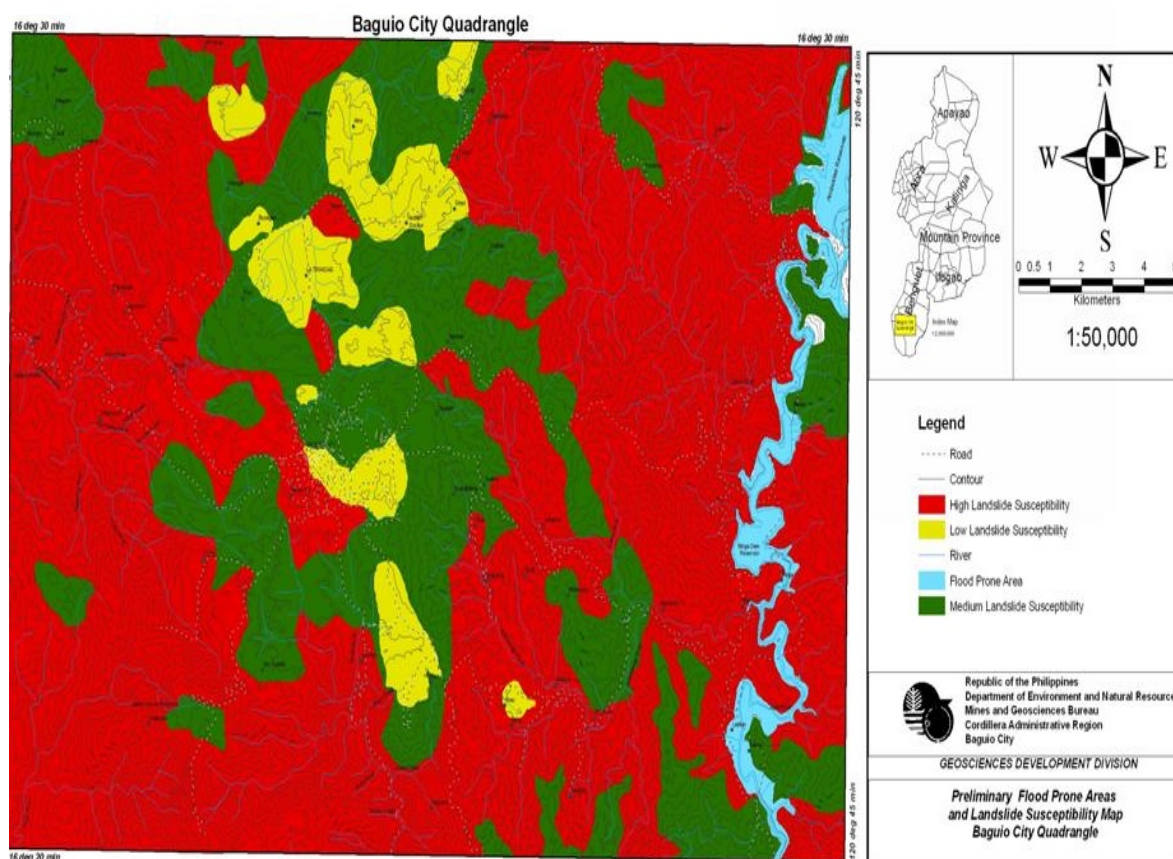
breakage. Rain, rock debris, dead trees, garbage dumps, buildings, houses, and stockpiles are among the weight stressors for the landmass surface. In addition, improperly built houses and other structures aggravate the instability of steep slopes, which later causes slope failure.

Given such physical characteristics as a seismically active region, mountainous environments, degraded lands, areas subject to frequent periods of intense rainfall, and areas subject to rapid development, Baguio has all the ingredients for a landslide-prone terrain.



Map 5. Geologic Map, Baguio City

Source: City Planning and Development Office, Baguio City



Map 6. Preliminary Flood Prone Areas and Landslide Susceptibility Map
– Baguio City Quadrangle
Source: DENR, CAR

6.2.4 Local Experience in EIA

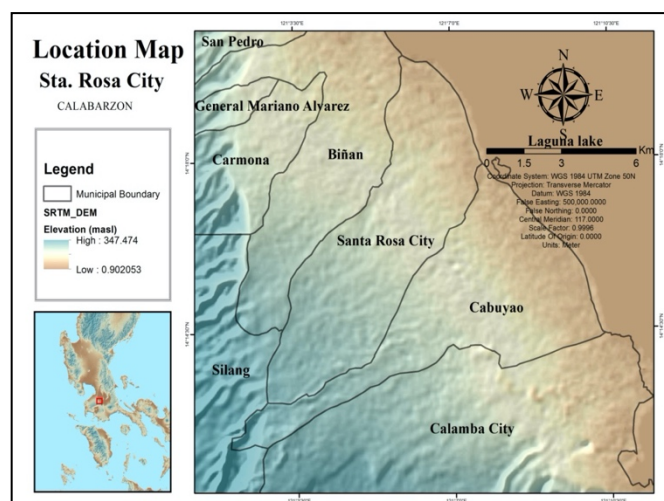
Baguio City is one of the most important urban centers in the region and the other parts of Northern Luzon (CAPO, 2009). On the other hand, due to the growing population and the booming economy, Baguio city poses numerous environmental threats (landslides, flash floods, mudslides). Projects that will incur impacts on the local environment must comply with existing environmental laws to protect the critical ecosystems and control the impacts of the project developments.

For Baguio City, project developments, just like other LGUs, must secure an ECC to formally commence the actual citing of development projects. However, the processing for securing permits is held at the regional level and not at the local level.

Communities acknowledge that disaster management is mainly a public sector responsibility. Gauging the actions of government at three levels (i.e., national, city and barangay), residents in Baguio are undecided on whether or not the government was really prepared, citing the different scales of impacts in different locations.

6.3 Case Study Area 2: Sta. Rosa City

Sta. Rosa City became a city in 2004. It has a total land area of 54 km² in the northwestern part of Laguna Province. Bounded by the cities of Biñan in the northwest and Cabuyao in the east, and the municipality of Silang, Cavite in the west and the Laguna Lake in the northeast, Sta. Rosa City is among the growing residential estate cities assuming for the housing requirements of the population of the Greater Manila Area. In addition, it is a site of residential, commercial, and industrial expansion from Manila — considered a major growth center in Laguna.



Map 7. Location Map, Sta. Rosa City

The city of Sta. Rosa is a first-class component city. It has slopes ranging from 0.0 to 2.5 percent, indicating level to nearly level lands (97.89 percent). It is 40 kilometers away from Manila. The predominant land uses in the city include residential and commercial, manufacturing, industrial, and institutional uses, although it started primarily as vast agricultural lands and grasslands. Sta. Rosa City has a population of 353,767 (PSA, 2015), distributed among 18 urban barangays.

6.3.1 Development Trends and Spatial Growth

The spatial growth of the city of Sta. Rosa can be traced from the Spanish period, American and post-war planning efforts, and the recent spatial developments brought about by infrastructure development and decentralization policies of the national government.

The earliest records show that the old settlement in the area where Sta. Rosa now lies forms part of a mere barrio of Biñan called Barrio Bukol. Then the spatial growth started with the old church of Santa Rosa de Lima that was built at the currently “Poblacion” or town center constructed as early as 1796, serving as the reference point in the establishment of the old “Municipio” or municipal town hall, the public plaza, and the street alignment – a Spanish style planning.

The Spanish-inspired settlement commenced the growth of the urban area for Sta. Rosa. Other housing units followed. Thus, many Spanish-type *bahay na bato* houses in the city are still present. Among these houses included the Zavalla, Tiongco, Gomez, and Gonzales ancestral houses (Pablo, 2012).

Aside from the local population, migration of people to the area also happened. Many skillful Chinese artisans from the Parian of Intramuros settled permanently after constructing the church, which was completed 15 years after. In addition, some Chinese became rich “*inquilinos*” who leased the farmland from the friars and subsequently rented by farmer tenants. It was a convenient arrangement widely practiced in Laguna during those times. Outside the then urban area of Sta. Rosa, vast tracks of “*sakatehan*” or grassland with scattered nipa and bamboo houses describe the rest of the area (Pablo, 2012).

With the establishment of the Insular Government of the Americans, all friar lands in the Philippines were purchased for distribution to the local people on an installment basis. In Santa Rosa, the Dominican friar lands were bought for Php 14.4 million on July 4, 1901. The reconstruction period was initiated by the civil government allocating Php 2 million for the construction of roads, bridges, and school buildings in Santa Rosa. At the same time, German Arambulo, a wealthy philanthropist with a great vision for the town, donated his family-owned land estates as a site for the present-day public market, playground, and elementary school building. The famous Santa Rosa Arch, a small replica of the Arch of Triumph in Paris, France, was built in 1931. In a sense, the municipality's modern-day physical planning and development started during the early period (Pablo, 2012). Although there were many physical implements in Sta. Rosa, still, its local economy was predominantly agricultural dependent on farming, fishing, livestock, and small backyard industry.

The influence of industrialization came in the 1980s with the entry of foreign multinational companies in the registered economic zones and industrial estates in Sta. Rosa. This is coupled with the timely opening of the South Luzon Expressway (SLEX) in the 1980s. Many private business enterprises started to come in, particularly the mothballed Filipinas Synthetic (Filsyn), followed by the Coca-Cola Bottling Company plant, the Ayala-owned Laguna Technopark Inc., and other notable huge private sector investment in residential development.

From a fourth-class municipality in 1986, Santa Rosa became a first-class municipality in 1993. Santa Rosa became a component city in 2004. Presently, the City has been recognized as a fast-rising investment capital of South Luzon, next to Metro Manila.

The spatial development of Sta. Rosa, from a sleepy agricultural community now regarded as a “bedroom area” of Metro Manila, shows a massive transformation into a boomtown—becoming the center of business, commerce, and industry not only in Laguna but also the whole of CALABARZON region, the fastest growth center of the country (Pablo, 2012).

The social and environmental economic costs of rapid urbanization are showing signs of rapid population growth due to migration, daily traffic congestion, prohibitive price land acquisition, rapidly vanishing agricultural areas, sprouting squatter colonies, seasonal unemployment, chemical pollution of rivers, flash flooding, and increasing garbage generation (Pablo, 2012).

6.3.2 Land Use Planning Institutions, Policy, and Decision-Making Processes and Structures

As a component city of the province of Laguna, Sta. Rosa City's physical planning efforts are highly linked with the physical planning efforts of the province of Laguna.

The local land use committee of the city of Sta. Rosa includes the development sectors representatives from the local development councils, local department offices, and various interest groups in the locality like the NGOs, private sector, and POs, to mention a few. Similarly, the local development and land use committee, headed by the Sta. Rosa City Planning and Development Office is the group that crafts the local land use plan for the city.

Consequently, the review of the local land use plan is done at the province level by the Provincial Land Use Committee (PLUC) to be approved by the *Sangguniang Panlalawigan*. If all aspects of the four policy areas of the land use plan- protection, production, infrastructure, and settlement crafted by the local development council harmoniously coincide, then the local *Sanggunian* adopts the land use plan and implement it through the zoning ordinance.

Although a tedious process, this important activity guides the physical growth and development of the city of Sta. Rosa. Effective inter-department coordination at the local level and vertical communication from the city to the provincial level is crucial for increasing the chances of creating a land use plan for the use of the local community.

The predominant land uses of the city are as follows:

- Residential and commercial;
- Manufacturing and industries;
- Institutional uses;
- Has 154 subdivisions, 34 of which are in Barangays Tagapo, Balibago, Macabling, Sinalhan, and Poo; and
- Host to four industrial estates providing over 86,000 direct employment.

6.3.3 Environmental Considerations in Spatial Planning

Endowed with land and water resources, these same natural features within the administrative jurisdiction of Sta. Rosa may also provide substantive information related to its innate character that would lessen the impacts of natural hazards if proper planning and risk management were done.

The city of Sta. Rosa is primarily flat, with areas having slopes ranging from 0.0 to 2.5 percent ideal for any sort of development, and some areas having terrains with 2.6 to 5.0 percent slopes (mainly in barangay Sto. Domingo). This topographic condition only shows plains as the primary landform. According to the city profile of 2015, there are three categories of land formations in Sta. Rosa, to wit:

- a. Lacustrine alluvial plains occur along the lakeshore areas. Fluctuations of lake waters along this edge of the municipality have dictated its land formation and vegetative cover. Situated along the lakeshore are Sinalhan, Aplaya, and Caingin. Portions of the Market Area and Ibaba are considered lacustrine as well.
- b. Broad plains consist of higher and more stable flood plains on level to nearly level terrain formed by alluviation. The soils are moderately well-drained. A majority of the barangays, including the Poblacion, may be found here. These include Tagapo, Kanluran, Malusak, Labas, Dila, Dita, Pooc, and portions of the Market Area, Ibaba, Pulong Sta. Cruz, Malitlit, and the lakeside barangays.
- c. Undulating tuffaceous plains are moderately dissected piedmont plains with the topography of undulating to rolling. Steep side slopes may be found along dissections and rivers. Such a formation is found in Don Jose and Sto. Domingo, along with portions of Pulong, Sta. Cruz, and Malitlit.

The surface water under the jurisdiction of the city of Sta. Rosa includes the Santa Rosa river and a portion of the Laguna de Bay. Santa Rosa River has its source from the watersheds of the neighboring province of Cavite. It acts as a natural boundary from the municipality of Biñan before it drains into Laguna Lake. DENR categorizes the river as class C, meaning it is only suitable for aquaculture, fisheries, recreation, and extraction for industrial uses.



Picture 6. Laguna Bay Tributaries Clogged with Garbage

On the other hand, Laguna Lake, ebbing the northeastern shores of Santa Rosa, is the largest lake in the Philippines. The lake has a total surface area of 90,000 hectares, an average depth of 2.8 meters, and a total volume of 3.2 billion cubic meters. There are 21 tributaries contributing to the lake, including the river of Santa Rosa. Thus far, the lake is only suitable for aquaculture, fisheries, recreational activities, and industrial uses. Although the lake is naturally euphoric and highly productive, it is polluted because of human activities in the watershed carried via tributaries or directly into the lake.

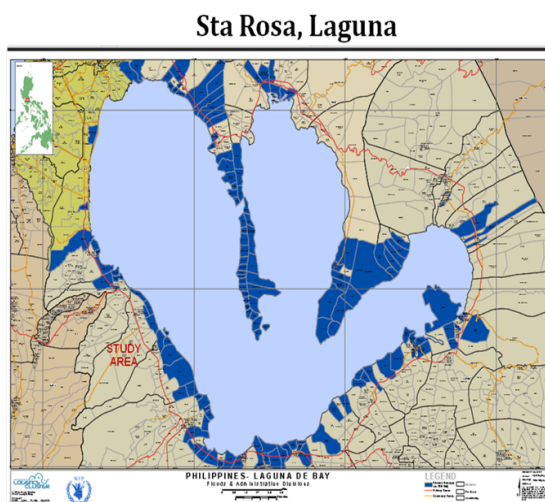
There are two primary hazards where the city is susceptible. These include earthquakes and flooding. The region of Laguna is strongly faulted given the presence of the Marikina Valley Fault, which traverses a north-south direction. The fault is disrupted by several minor steep faults along its course that reflect the volcanic activity relative to the area. Earthquakes are a hazard in Santa Rosa as the West Marikina Valley Fault traverses Sto. Domingo.

Flood hazard certainly affects the city as floodplains sprawl a total area of 302 hectares situated in this zone are Sinalhan, Aplaya, and Caingin, including portions of Tagapo, Ibaba, Labas, Poo, Dila, and Dita. Slight seasonal run-off flooding is characterized by accumulated shallow run-off floods, which subside within a short period ranging from a few hours to three days. This occurs in low to moderately low flood plains situated in Kanluran, Malusak, and Ibaba. Floods in these areas are due to run-off accumulation coming from surrounding elevated areas, low physiographic positions, poor infiltration, permeability characteristics, and drain ability outlet. These areas are perceived as inadequate for urban uses. Flood limitation could be minimized by proper and adequate drainage planning for draining excessive water.

Moderate seasonal flooding is characterized by more frequent and deeper run-off water. The floodwater subsides after a week to a few months. This condition is observed along the lakeshore in Caingin, Aplaya, and Sinalhan and the adjacent northeastern tip of Ibaba, Market Area, and Tagapo. These areas serve as the catchment of water coming from the higher areas and are characterized by insufficient drain ability outlets, shallow infiltration, and hydraulic conductivity (Sta. Rosa Profile, 2015).

These hazards and the misuse of natural resources only increase the city's vulnerability to natural disasters. In summary, Sta. Rosa is prone to several hazards, including earthquakes and the impacts of hydro-meteorological events such as typhoons and flooding.

Flooding is a special concern, especially in the coastal barangays of Sta. Rosa and the barangays near the tributaries draining to the lake. Informal housing facilities also flock to the sides of tributaries and coastal areas resulting in the increased susceptibility to the disastrous impacts of typhoons and flooding.



Map 8. Flooded Areas Surrounding
Laguna Lake

6.3.4 Local Experience in EIA

Like any other process of obtaining environmental compliance of development projects, the City of Sta. Rosa is no different in terms of the processes and the institutions involved in acquiring an environmental compliance certificate (ECC) from the EIA process.

The regional office is the primary authority for processing the certificates as applied for by the implementing sectors. The local government, through its supporting local ordinances, guides the process by providing local standards and policies for the safe and effective implementation of the desired development projects.

The city has positive feedback in terms of EIA compliance. Half of the infrastructures complied with EIA. These were observed since Sta. Rosa City has several subdivisions and other privately-owned settlement areas, and industrial buildings, among others. However, there is still inconsistency regarding the compliance in the EIA in Sta. Rosa City. According to the key informants, reasons for such include the ambiguity or unacceptability of indicators to the project proponents, and the results of the EIA are not integrated into the LUP. There is a lack of support from the local government in terms of public consultation or participation.

6.4 Perceptions on EIA and LUP in View of Climate Change in the Case Study Areas

Associated with the rapid development of a region is the topic of climate change. Impacts of climate change, especially in the Philippines, are associated with extreme weather disturbances such as floods, typhoons, and landslides. These could significantly affect the economic and socio-cultural lives of the community (Rincion and Virtucio, 2008).

Perceived Causes of Climate Change

It is important to understand how the community recognizes the root cause of climate change. It will show what mitigation strategy is suitable for the environment where the community belongs. Below is the figure showing the perceived causes of climate change based on the survey gathered in both cities (Baguio City and Sta. Rosa City). A majority or 62 percent of the respondents agree that climate change results from natural and human processes. It was then followed by human activity with only 37 percent, and lastly, only one percent agrees to natural processes as the cause of climate change. Both systems recognize that climate change is a result of human activities, which would result in a declining land resource base and extreme weather events/disasters. See Chart 1.

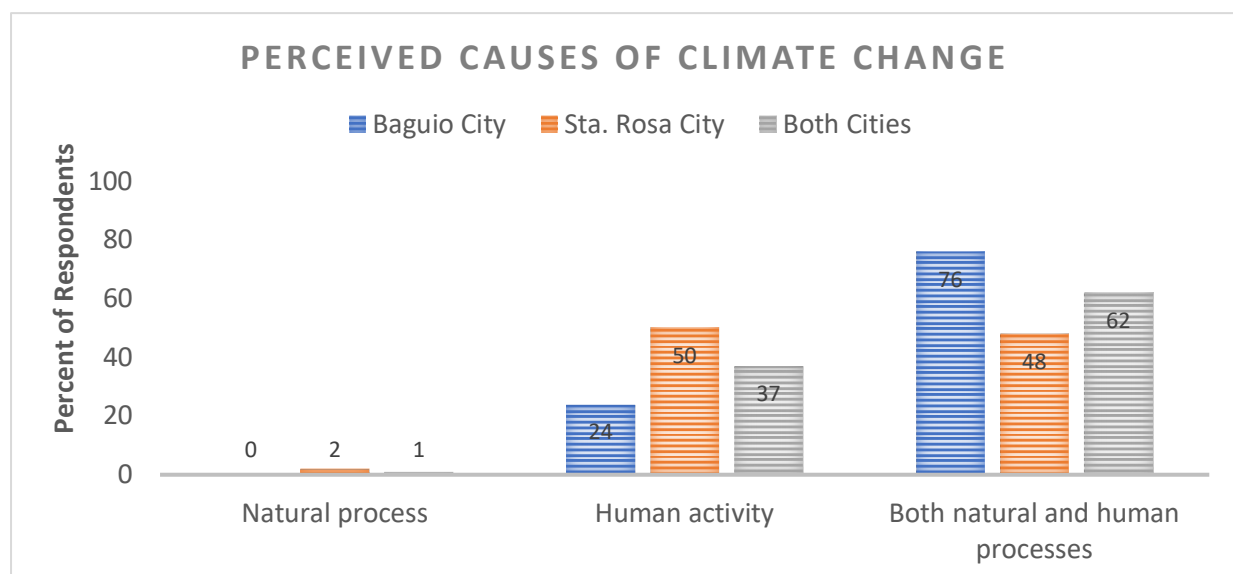


Chart 1. Perceived Causes of Climate Change

Perceived Effects of Climate Change

The participants were surveyed regarding the effects of climate change from both case study areas located in Baguio City and Sta. Rosa City. Ninety-six percent and 70 percent of the respondents from the case study areas in Baguio City and Sta. Rosa City, respectively, perceived non-stop rains as one of the effects of climate change. In cases where perceived effects of climate change are damaged houses and structures, damaged roads, work disruption, and damaged utilities, more respondents from the case study area in Baguio City agreed than respondents from the case study area in Sta. Rosa City. Whereas 98 percent of the respondents from the case study area in Baguio City perceived landslides/erosion as another effect of climate change while no one from Sta. Rosa City agreed.

In contrast, 100 percent of the respondents from the case study area in Sta. Rosa City perceived flooding as an effect of climate change, while only about 48 percent of the respondents from the case study area in Baguio City agreed. Cities are commonly vulnerable to the effects of climate change (e.g., landslides and flooding) as they are immobile, and climate change can pose severe problems in its infrastructure and other components due to unadaptable circumstances (World Bank, 2010).

Chart 2 shows the other perceived effects of climate change to the residential communities, including nonstop rains, damaged houses and structures, damaged roads, disruption of work, and damaged utilities, which were all observed by the respondents from the case study areas in both cities.

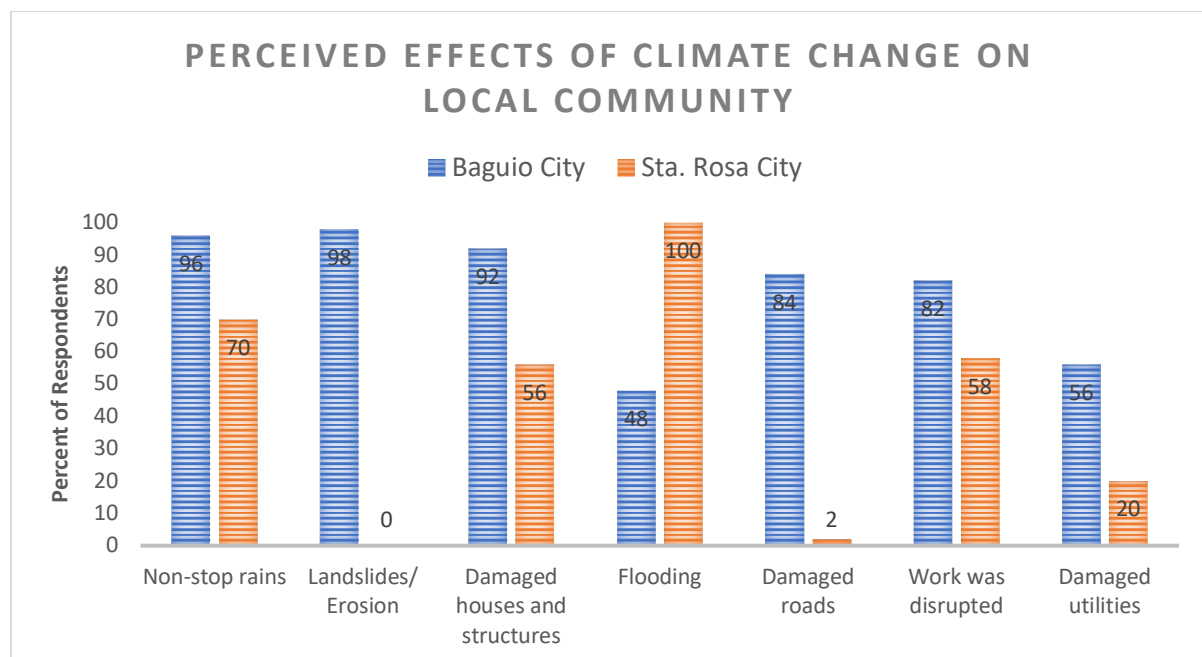


Chart 2. Perceived Effects of Climate Change on Local Community

Both respondents from the case study areas in Baguio and Sta. Rosa Cities associate climate change impacts largely with nonstop rains, landslides, erosion, damages to property and life, flooding, and socio-economic losses. The most alarming impact in Baguio relates to land movements (erosion), whereas Sta. Rosa relates climate change to flooding.

Changes in the Community due to Climate Change Impacts

Another factor examined in these two case studies was the changes in the living conditions of the residential communities in the case study areas in both cities due to climate change. In the case study area in Baguio City, 79 percent of the respondents said that climate change worsened their state of living, while 21 percent said they are experiencing a slight worsening due to climate change. On the other hand, in the case study area in Sta. Rosa City, most of the respondents (52 percent) said that they are experiencing a slight worsening of living than those of IP20 (43 percent) who said they are experiencing a worse state of living due to climate change. Only four percent said that they do not experience any changes due to climate change. See Chart 3.

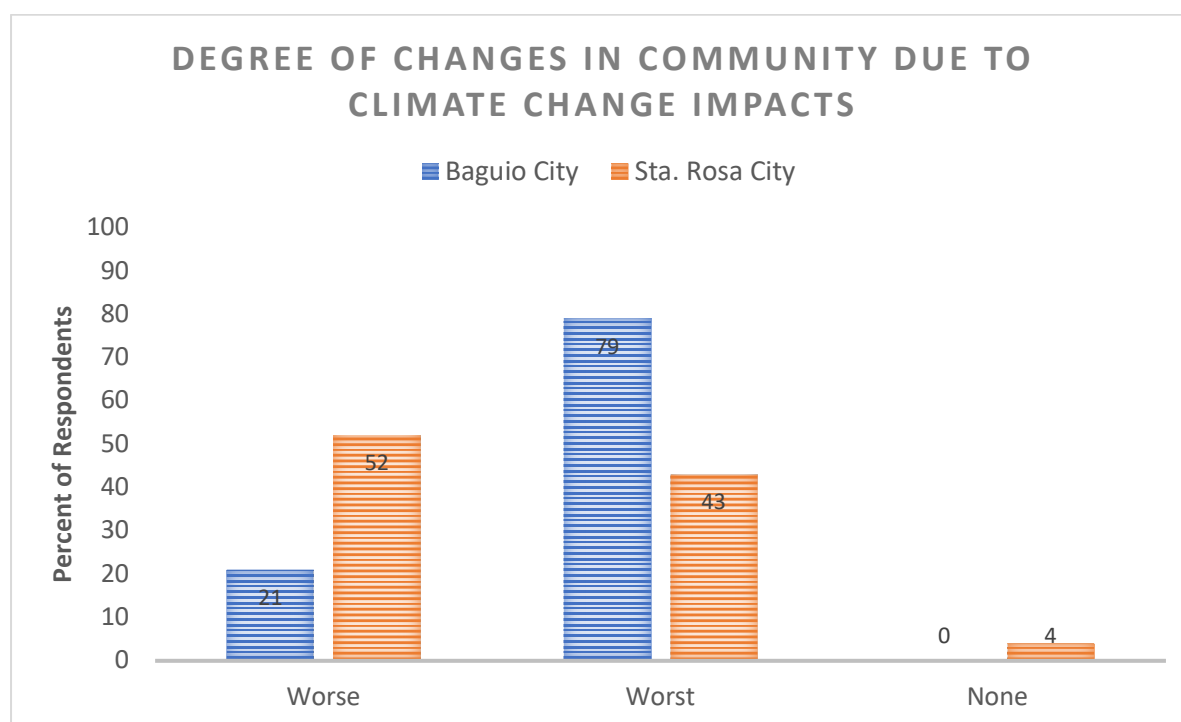


Chart 3. Degree of Changes in Community due to Climate Change Impacts

This was supported by the fact given by the respondents regarding the observable changes felt before a disaster, which was perceived due to climate change. The majority of the respondents refer to job opportunities as one of the observable changes before a disaster strikes. According to Intergovernmental Panel on Climate Change (IPCC), the economic sector in the community is one of the most affected by climate change since this largely depends on weather conditions that are most likely to affect fisheries and agriculture (2002). These economic sub-sectors were

evident in both cities affected – Baguio city for agriculture and Sta. Rosa City for fishery. Other changes observed include extreme flooding and frequent landslides.

Observed Changes in the Community before the Typhoon

Both case study areas in the two cities observed increased economic activities and community population, insufficient water supply, landslide frequency, and flooding incidents before Typhoons Ondoy and Pepeng. See Chart 4.

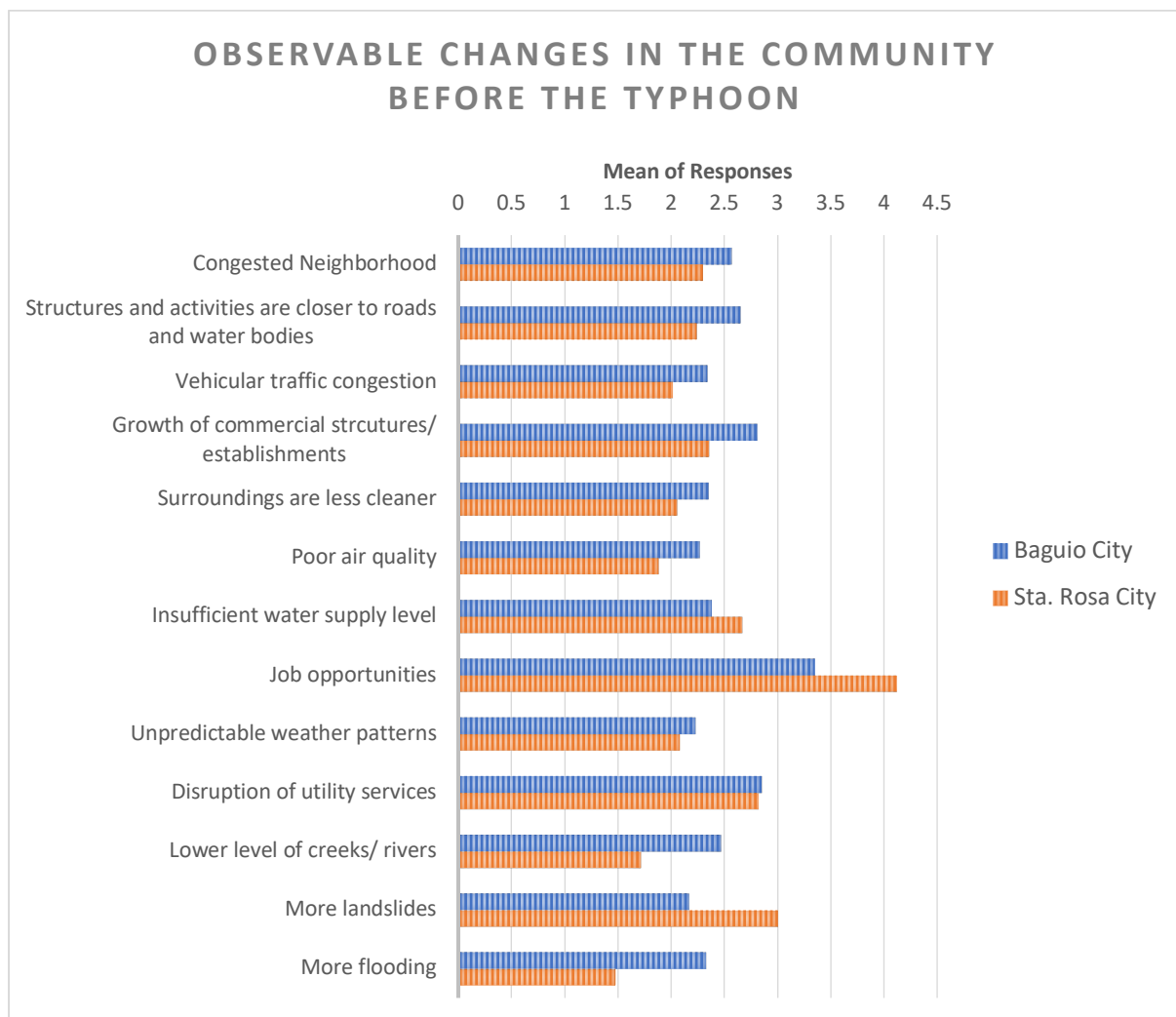


Chart 4. Observable Changes in the Community Before the Typhoon

Note: 1= Improved; 2 = Slightly Improved; 3 = No Change; 4 = Slightly Worsened; 5 = Worse-off.

Level of Awareness to Disasters

The majority of residents in both study areas were very much aware of the possible kinds of disasters that may happen to their community. Residents in both study areas of the two cities are aware of the landslide- and flood-prone areas in their communities. The level of awareness

on both study sites was based on the respondents' experiences on previous disasters that happened to them up to the present situation of the area. See Chart 5.

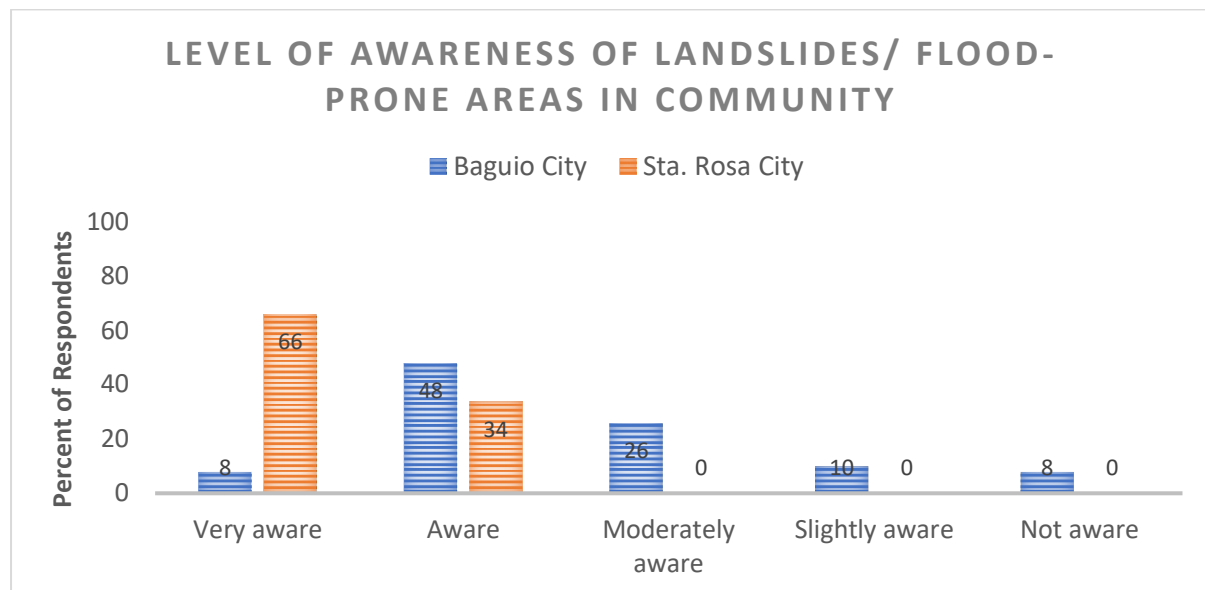


Chart 5. Level of Awareness of Landslides/ Flood-prone Areas in the Community

Sources of Information on Landslides/ Flood-prone Sites

Their knowledge is based mostly on personal account (witnessed or experienced), followed by information from fellow residents or neighborhood, and the media such as infographics, social media websites (e.g., Facebook, Twitter); the local government of the respective areas, and non-local government people or private organizations and groups that study the areas (See Chart 6.) Government and NGOs are the least sources of information of risk-prone areas.

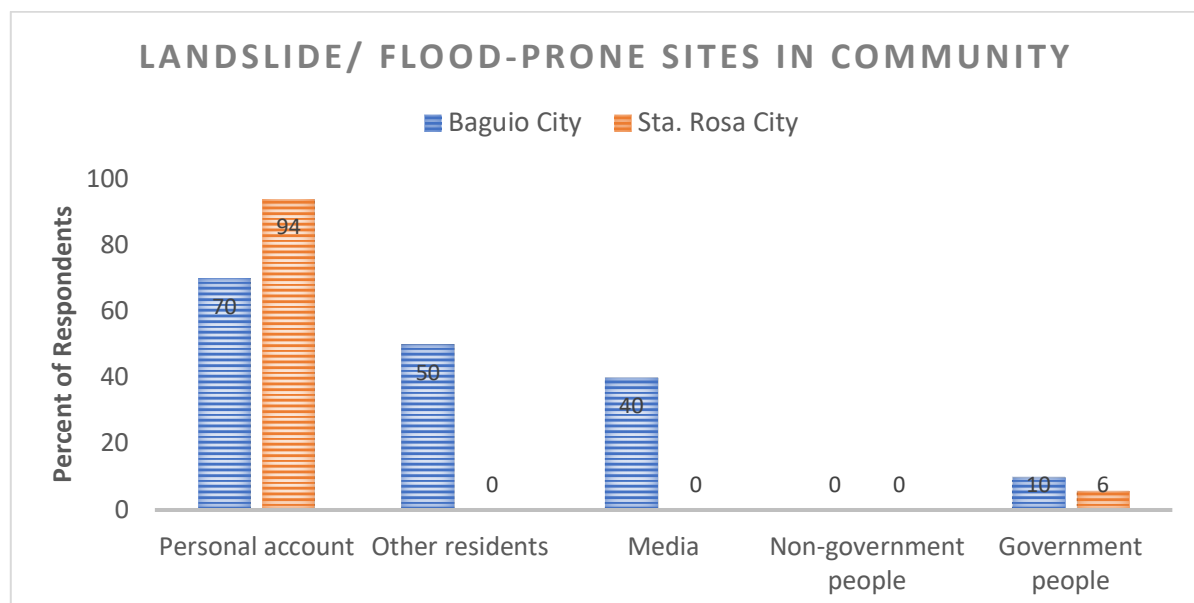


Chart 6. Information Sources of Landslides/ Flood-prone sites in Community

Since both of the municipalities belong to urban areas in the Philippines, these places consist of necessary infrastructures for economic and social development (e.g., factories, hotels, terminals, malls, subdivisions, and villages). Therefore, awareness of infrastructure regulations will provide adequate knowledge on what actions the local government should consider. Shown in the chart below is a comparison of results between Baguio City and Sta. Rosa City concerning the respondents' awareness from the case study areas regarding the regulations or infrastructural development of both municipalities (e.g., location structures, waste management, and building permits).

The case study area in Sta. Rosa City showed a high frequency of respondents that indicated a positive awareness of the infrastructure regulations, with 18 and 22 saying they are moderately aware and aware, respectively. In comparison, the case study area in Baguio City has many respondents who said they are slightly aware of the development regulations on infrastructure. Factors to consider in this case include the fact that Baguio City has over 70 percent of its population belonging to informal settlers and not registered to the building office. On the other hand, Sta. Rosa City's residential development is dominated by privately led subdivisions having 154 planned residential areas across 18 barangays.

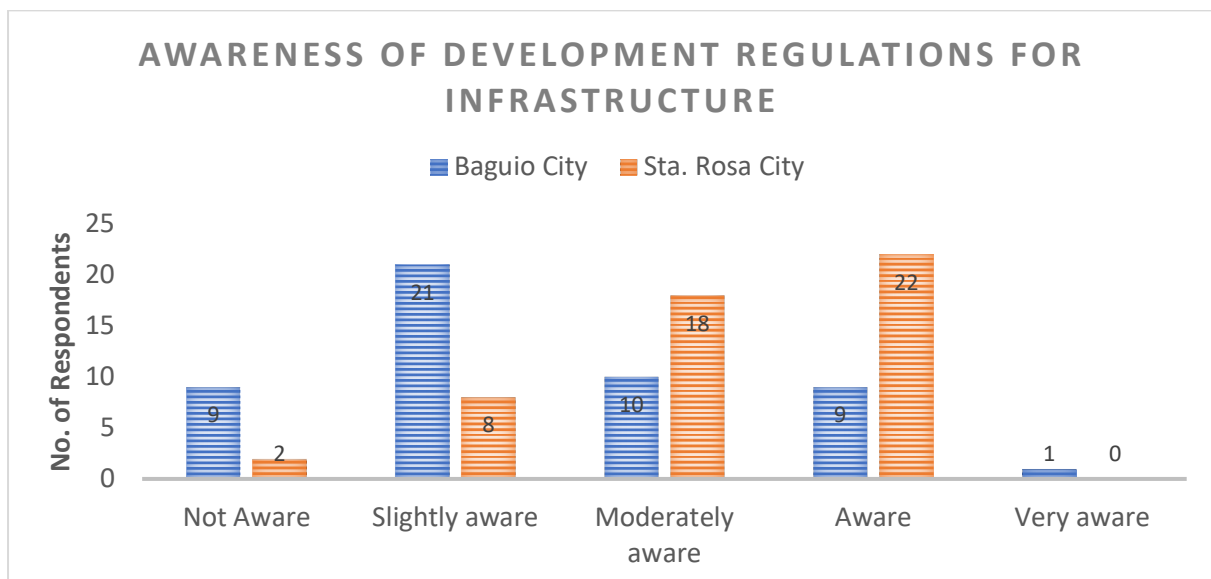


Chart 7. Awareness of Development Regulation for Infrastructure

One of the main struggles regarding the problem in development regulations is the ease of compliance. Respondents from the case study areas in both municipalities perceived difficulty in complying with development regulations. Baguio City had a higher percentage of responses saying, “very difficult to follow” (95 percent) and five percent saying that regulations are easy to follow. On the other hand, respondents from the case study area in Sta. Rosa has a lower percentage of difficulty responses with 85 percent and 15 percent for easy to follow. Since the majority of the land area of Sta. Rosa City is composed of privately owned real estates, a higher percentage of compliance is observed. At the same time, in Baguio, where 70 percent of the settlements are informal and illegal settlers, lower compliance was observed.

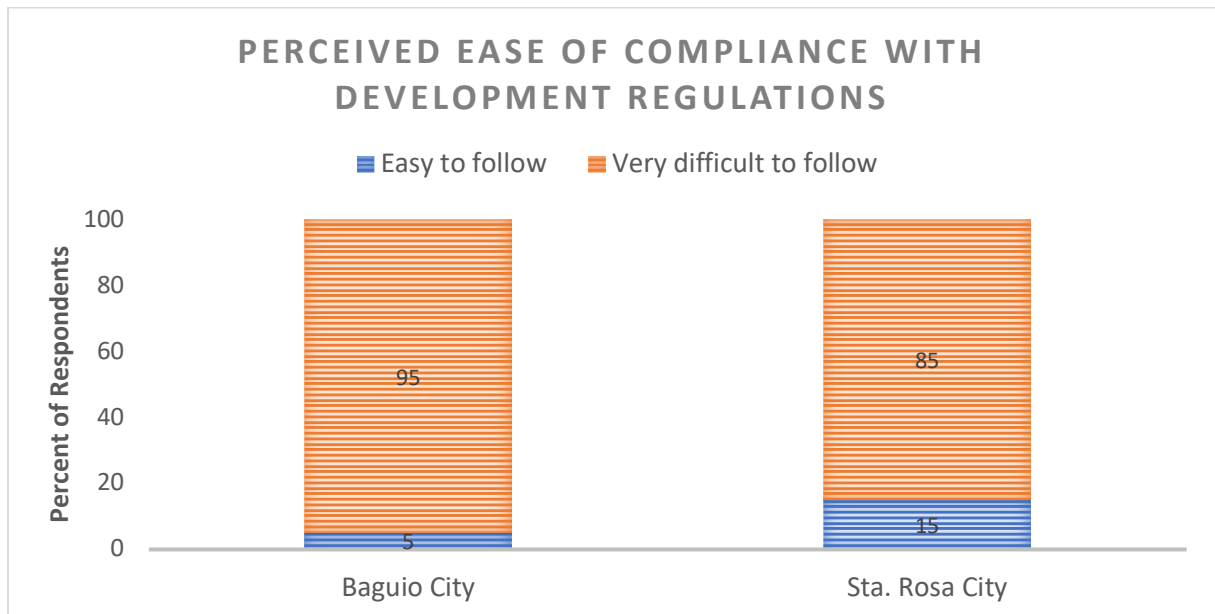


Chart 8. Perceived Ease of Compliance with Development Regulations

The top five reasons for such difficulty in compliance include the following: absence of alternative suitable location, lack of finances to comply with building standards, no technical expertise, too complex regulation process, and inadequate information regarding the standards.

Majority of the respondents from the case study areas in Baguio City and Sta. Rosa City found lack of finances (90 percent and 74 percent, respectively) and absence of suitable location (85 percent and 81 percent, respectively) as the top 2 reasons for the difficulty in complying with development regulations. See Chart 9.

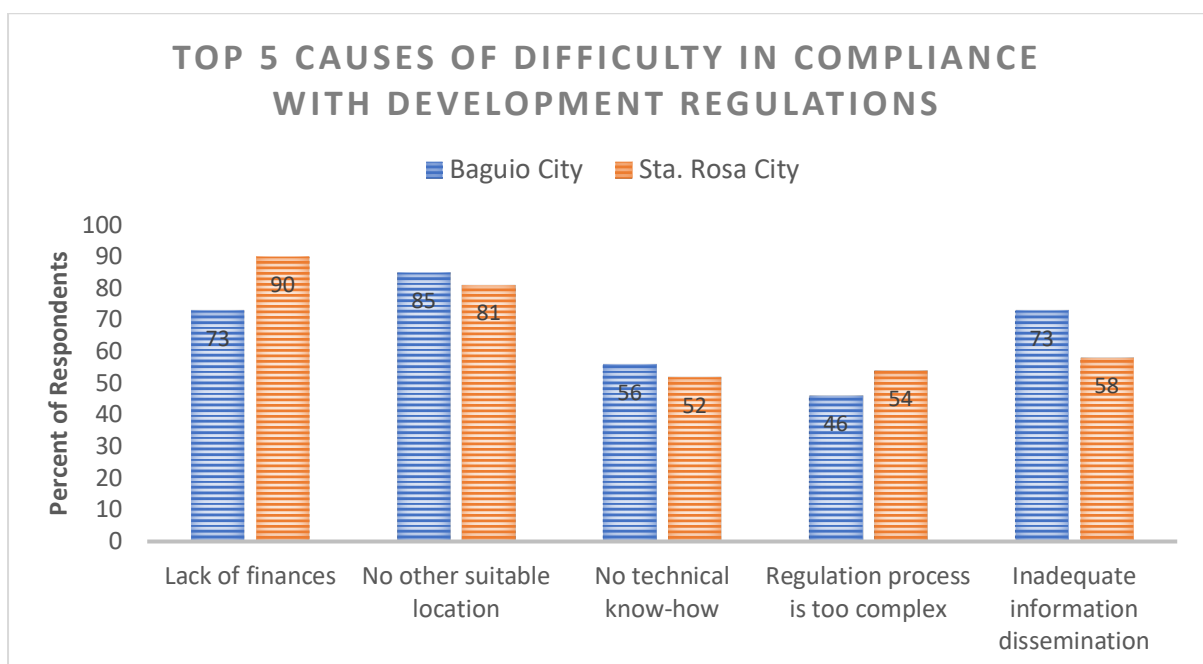


Chart 9. Top 5 Causes of Difficulty in Compliance with Development Regulations

Community participation poses great importance to a development project. They are encouraged and empowered to articulate and emphasize their own goals, methods, and process on problem-solving, which can be used by the developers, which could influence the quality of services to be offered (Mathbor, n.d.). Majority of the respondents from the case study areas in both Baguio City and Sta. Rosa City did not know (76 percent and 90 percent, respectively) and were unaware of pre-development consultation with the community (20 percent and six percent, respectively). Only about four percent of the respondents of both case study areas from each City expressed awareness of pre-development consultation with the community.

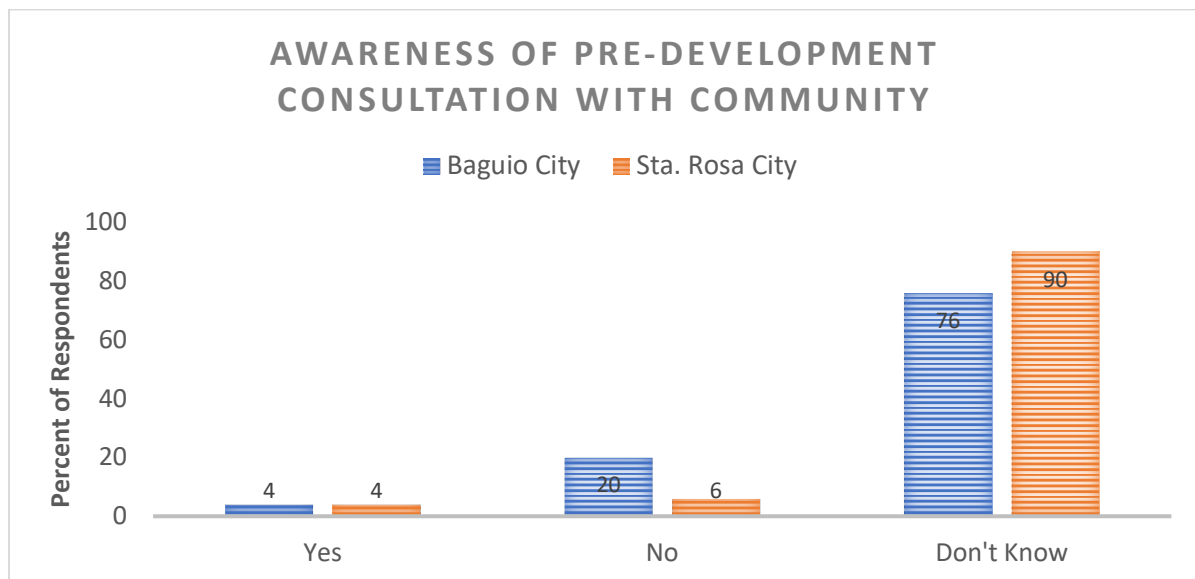


Chart 10. Awareness of Pre-Development Consultation with Community

Majority (64 percent) of the respondents from the case study area in Baguio City and all respondents from the case study area in Sta. Rosa City were aware of the recent infrastructural projects (e.g., subdivisions and commercial buildings) in their community.

Respondents from the case study area in Sta. Rosa City are aware of large-scale development like subdivisions or commercial buildings in their areas. Like the knowledge on risk-prone areas, they learned about these from personal account or from fellow residents but rarely from the government.

In Baguio City, interviewed local officials admit their limitation on “public advisories” due to “inadequate resources and staff.” This is validated by the uncertainty of most respondents on whether there were consultations conducted before the construction of these infrastructures.

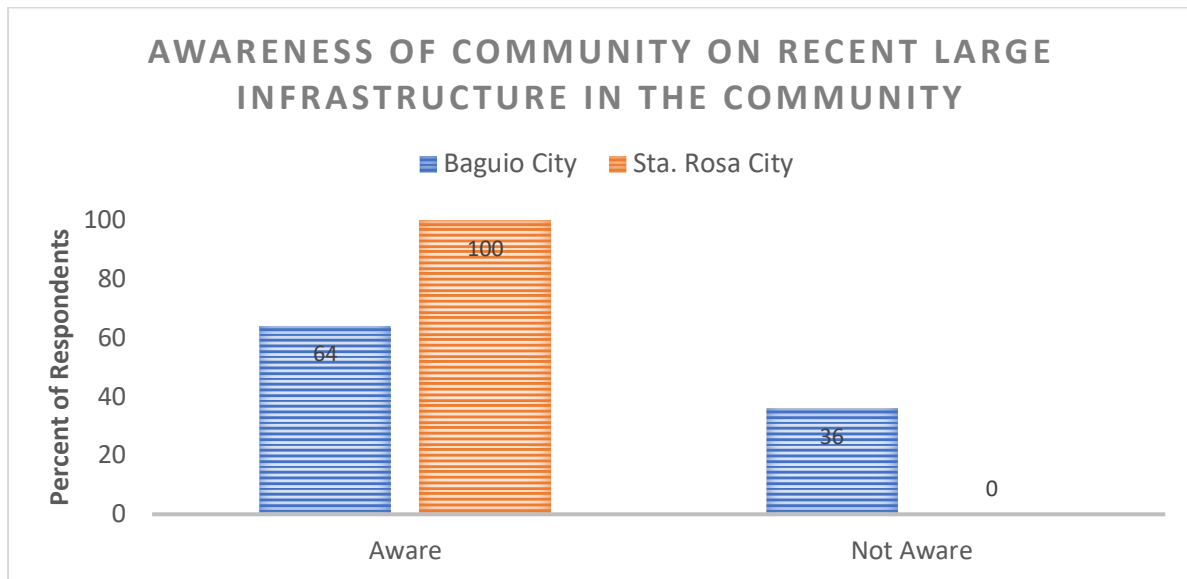


Chart 11. Awareness of Community on Recent Large Infrastructure

In light of the changes they have observed in their communities and the worsening state of their physical environment, most respondents interviewed from the case study areas in Baguio City (88 percent) and Sta. Rosa City (92 percent) agree that the public should be consulted before implementing any large-scale land development. This, accordingly, helps them understand the effects of such developments on water resources, potential disaster risks, and other changes in the quality of their environment.

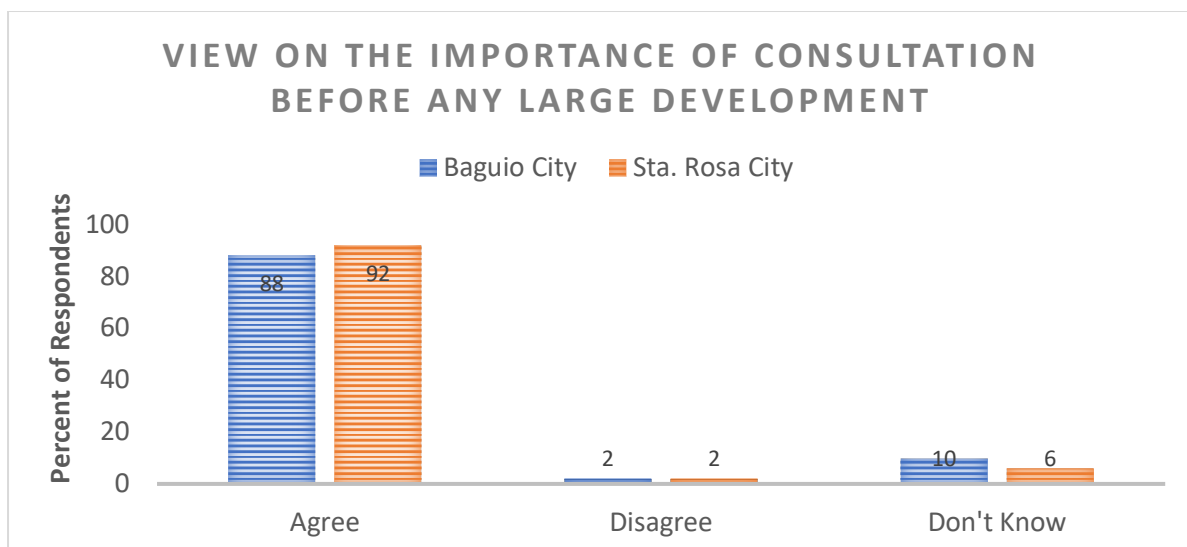


Chart 12. View on Importance of Consultation Before Large Development

However, some sectors believed consultations were a “perfunctory” process to formalize whatever decision has already been made and meet “consultation requirements only.” Local government unit officials who were interviewed claimed that it is the EMB who decides when and when not to conduct a consultation. Often, the community is not informed about the implications of these developments on them.

Perceived Preparedness of Government to Minimize Climate Change Impacts

Some sectors perceived that the government was relatively prepared, citing the “outpouring of assistance from various sectors” in heavily damaged communities.

The most prepared of all public authorities is the national government. The least prepared are those in the barangays according to respondents from the case study area in Baguio City and those in the city in the case of the respondents from the study site in Sta. Rosa City. See Chart 13.

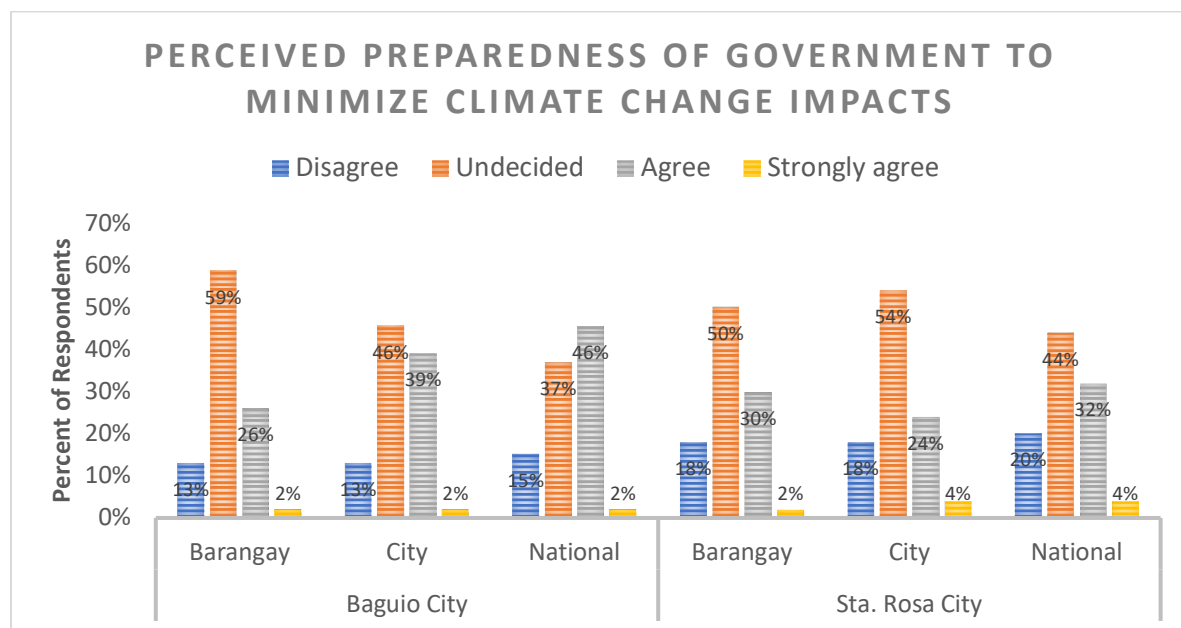


Chart 13. Perceived Preparedness of Government to Minimize Climate Change Impact

Chapter 7: EIA and LUP in the Study Areas and Their Impacts

7.1 EIA and LUP: Examining the Practice

7.1.1 Projects Subjected to EIA

The number of residential projects in Baguio City subjected to Environmental Impact Assessment (EIA) for five years from 2005 to 2009 has not increased. Chart 14 shows a downfall in the compliance on the years from 2007 to 2009. As of 2009, there were 662 residential projects registered with the local office, but based on the record, only 22 were subjected to EIA (Baguio City Building Office and Zoning Office, 2009). Less than ten percent of the buildings registered in the local building office in Baguio were subjected to EIA (CBAO, 2009).

These buildings were issued zoning clearances since these are a prerequisite to any infrastructure development by the private sector (Baguio City Building Office and Zoning Office, 2009). The rest were reported as “not covered” by EIA, according to the local officials. Reasons for such included the following: ignorance of the requirements, not being aware of the relevance of the EIA, and absence of any mandatory lever to conduct one. Moreover, in relation to land use planning, the local government has a minimal appreciation of the EIA as a tool to aid in the decision-making process, especially in climate-related hazards.

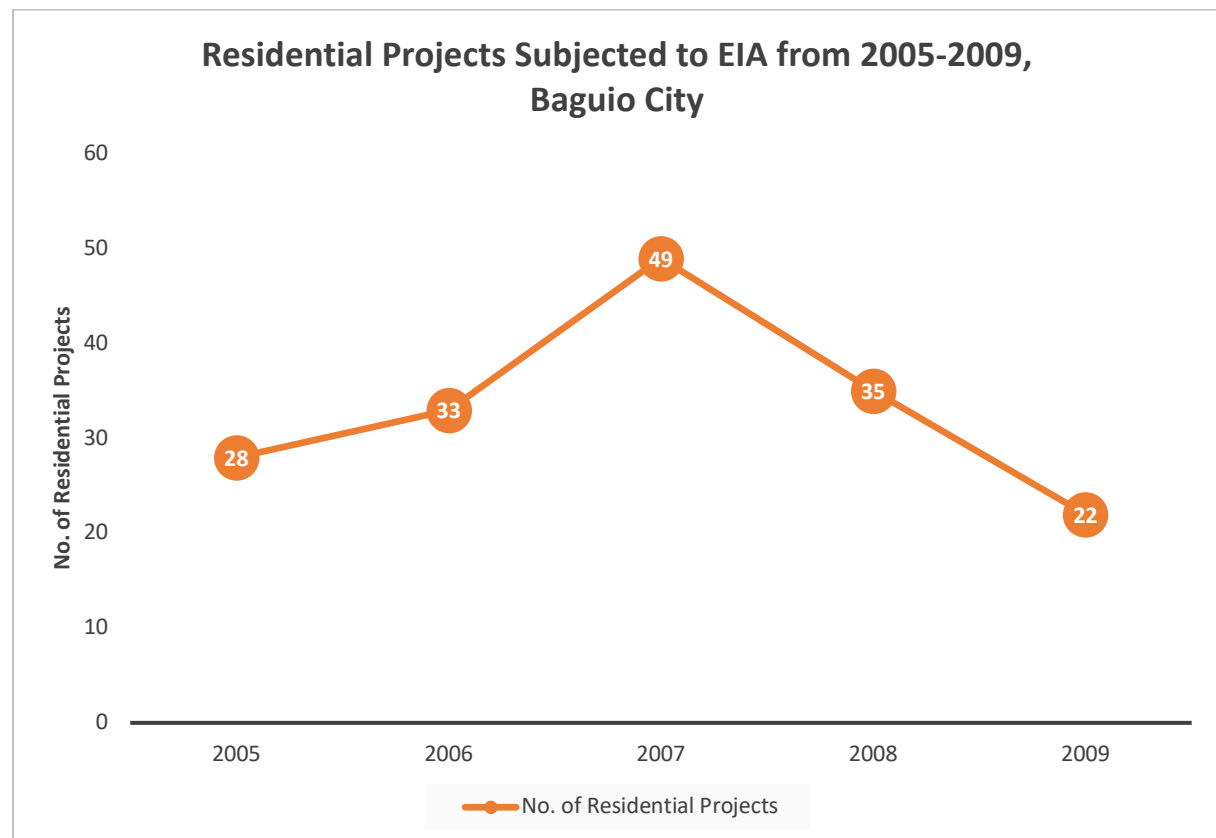


Chart 14. Residential Projects Subjected to EIA from 2005-2009, Baguio City

Source: EMB-DENR, 2010

In Sta. Rosa, all subdivision projects registered as of 2009 passed through EIA and were issued zoning clearances. However, illegal structures continue to proliferate in both cities and remain unchecked by the authorities. Individual houses or residential structures were not subjected to EIA due to “ignorance of the requirement,” “non-appreciation of the relevance of EIA,” and the absence of any “mandatory lever” to conduct one.

There was little appreciation for EIA in relation to LUP as a tool to aid decision-making, especially in mitigating climate-related hazards. EMB authorities said that if “policies are refined, and agencies collaborate regularly,” EIA can rationalize land use policies. In practice, however, EIA results and databases are not integrated into LUP.

ECC conditions are rarely monitored. Indicators for compliance are “ambiguous” and sometimes “unacceptable to project proponents.” Unless infrastructure projects incite public clamor for massive consultation, these are pursued without participation from the LGU.

7.1.2 Land Use Planning

Mitigating climate-related hazards like flooding and landslides are generally the turf of disaster coordinating councils. Actions from this entity emanate from executive directives and are driven by local needs. Disaster monitoring reports from both cities suggest a strong linkage between land use dynamics and disaster mitigation. However, this information is not explicitly accounted for during the LUP process. Disaster-relation information only guides micro-actions or projects but is not elevated at the land use policy level.

Both LUPs in Baguio City and Sta. Rosa City are wanting of rational bases for land use policies and monitoring and evaluation of policy effectiveness.

The perception of the public on the government’s effectiveness to mitigate disaster risks is limited to “ground actions” (e.g., actual relief and rescue and rehabilitation operations). This perception indicates the fragmented policymaking on using land resources.

Both LUPs of the two cities have little consideration and vague policies on climate change impacts on residential sectors.

LUPs do have a distinct section dedicated to high-risk areas, much less policies for mitigating such risks. Thus, zoning regulations “assume equal standards and mechanisms for managing land resources.”

Baguio City LUP authorities acknowledged that:

- Residential sectors grow mainly due to “market-led forces” like the business interests of real property developers. No explicit planning at a broader scale is done.
- Zoning regulations in both cities articulate or “repeat national standards on building and infrastructure,” and residential development is more of an “unintended effect” of economic activities.
- Public-led infrastructures are “exempted” from zoning regulations (ex. Barangay halls are built on top of creeks and waterways.)

Sta. Rosa City LUP authorities claimed that:

- Economic zones or industrial estates and planned subdivisions are explicitly encouraged by local and national legislations. Being a strategic location next to Metro Manila, it serves as a secondary growth center in the southern Tagalog region. For this, explicit regulations are enforced on how these are built, but authorities claimed they have “little control” over “informal settlements and small or individual housing development.”

Comparative Institutional Analysis of Land Use Planning in Baguio City and Sta. Rosa City

Despite the common legal and procedural foundation of land use planning in the Philippines, the practical operationalization of this mandate varies significantly across Philippine LGUs due to diverse historical trajectories, ecological contexts, tenure systems, and stakeholder dynamics. This leads to markedly varied implementation stemming from distinct institutional structures, capacities, and interpretations, as demonstrated by the contrasting cases of Santa Rosa City and Baguio City.

Santa Rosa City, an urban-industrial center within the dynamic CALABARZON growth corridor, exemplifies a planning system aligned with economic expansion and investment-readiness. Its unified institutional setting features predominantly titled land and a coherent administrative regime. Private developers significantly shape its spatial development; large-scale, master-planned estates, often public-private partnerships, exhibit land use patterns aligned with private sector-driven investment, housing, and mixed-use commercial areas. Institutional coordination is largely technocratic, with political tensions less pronounced.

Baguio City, by contrast, presents a profoundly fragmented, historically layered institutional setup due to its complex legal status and acute ecological constraints. Its urban form is fundamentally shaped by the 1905 Burnham Plan, a colonial-era blueprint that laid out radial road networks, civic centers, and green corridors for a population of 25,000—far less than its current population of over 360,000 (2020). The spatial limits of this plan, combined with decades of rapid urbanization, have pushed the city into a pattern of unregulated expansion and

slope encroachment. Complicating this further is Baguio's designation as a Townsite Reservation (1907), which placed much of its land under public domain, making land acquisition and titling a national-level issue rather than a purely local matter. This legacy has led to persistent challenges with overlapping land regimes, including special patents, proclamations, informal settlements, institutional reservations, and ancestral domain claims under the Indigenous Peoples' Rights Act (IPRA). Consequently, the city's CPDO must coordinate not only with DHSUD but also with the NCIP and DENR to validate land claims, resolve disputes, and certify project compliance with environmental and indigenous rights policies.

Unlike Santa Rosa's streamlined system, Baguio's planning authority is limited by its plural legal environment. Even when zoning regulations are updated, enforcement is hampered by land tenure ambiguity, inadequate cadastral data, and competing institutional mandates. These conditions produce a contested governance environment, where civil society organizations, indigenous communities, environmental groups, and local political actors often clash over land use decisions. High-profile cases-- such as the opposition to tree-cutting permits for mall expansions or the redevelopment of Burnham Park-- underscore the legal activism and environmental consciousness embedded in Baguio's planning discourse.

Another notable difference lies in how each city integrates climate and disaster risk considerations. Baguio, situated in a geologically fragile mountain zone, has integrated disaster risk reduction more systematically into land use planning. Slope stability, earthquake vulnerability, and drainage issues are pressing concerns. However, limited developable land has driven the proliferation of informal vertical expansion and high-density settlements in hazard-prone areas. Santa Rosa, on the other hand, faces risks primarily related to flooding and land conversion, especially in relation to Laguna de Bay, but has better access to national resources and infrastructure support for mitigation (e.g., from LLDA and DPWH).

Finally, while both cities operate within regional coordination frameworks, the character of inter-local cooperation differs. Santa Rosa engages in regional transport, investment, and watershed management discussions as part of the Region IV-A cluster. Baguio, on the other hand, is part of the BLISTT (Baguio–La Trinidad–Itogon–Sablan–Tuba–Tublay) area, an inter-LGU framework designed to manage spillover urbanization and preserve ecological interdependence. However, the BLISTT model remains more aspirational than fully institutionalized, constrained by political rivalries, uneven capacities, and the absence of a binding regional authority.

Santa Rosa's institutional setup reflects a modern, investment-aligned, and relatively cohesive approach to land use planning, enabled by clear land tenure, formal land markets, and strong national-local cooperation. Baguio's institutional framework, however, remains profoundly influenced by its colonial heritage, ecological fragility, and complex, plural land governance. This results in a fragmented, contested, politicized planning environment, where practical execution frequently deviates from national guidelines due to pervasive structural and capacity

limitations. Ultimately, these divergences profoundly impact plan formulation and implementation, illustrating the tension between idealized technocratic models and Philippine urban governance's socio-legal realities.

7.1.3 Environmental Impact Assessment and Land Use Planning

EIA and LUP authorities acknowledged that:

- a) In both areas, EIA is viewed as a regulatory tool. LUP is a “vague policy declaration,” but the zoning ordinance is the regulatory tool and “more relevant” to the regulation of the development of land resources.
- b) EIA and LUP are independent processes, which are “flexible” and “can be adjusted anytime” depending on the thrust of “political administrations.”
- c) Climate change should be considered in any project or development activity, “regardless of scale.” However, only EIA has an explicit measure of considering the impacts of a development on climate change and climate change impacts on development. LUP does not have such measures by law or in practice.

All interviewed respondents in both cities agreed that EIA and LUP have the potential to mitigate the impacts of climate-related hazards. Among the strategies recommended were:

- clear policies on where, how, and density of infrastructure allowed;
- harmonized policies on environment and infrastructure development;
- prioritize implementation of mitigation measures for high-risk built-up areas;
- regular assessment of effects of climate-induced hazards;
- periodic assessment of actual effects of changes in the density and location of infrastructure on welfare and security;
- regular consultation with the community before any large-scale infrastructure development;
- regular public information on all types of hazards in an area and disaster susceptibility factors;
- adequate utilities installed in all types of structures; and
- policies on the conservation of environmental resources.

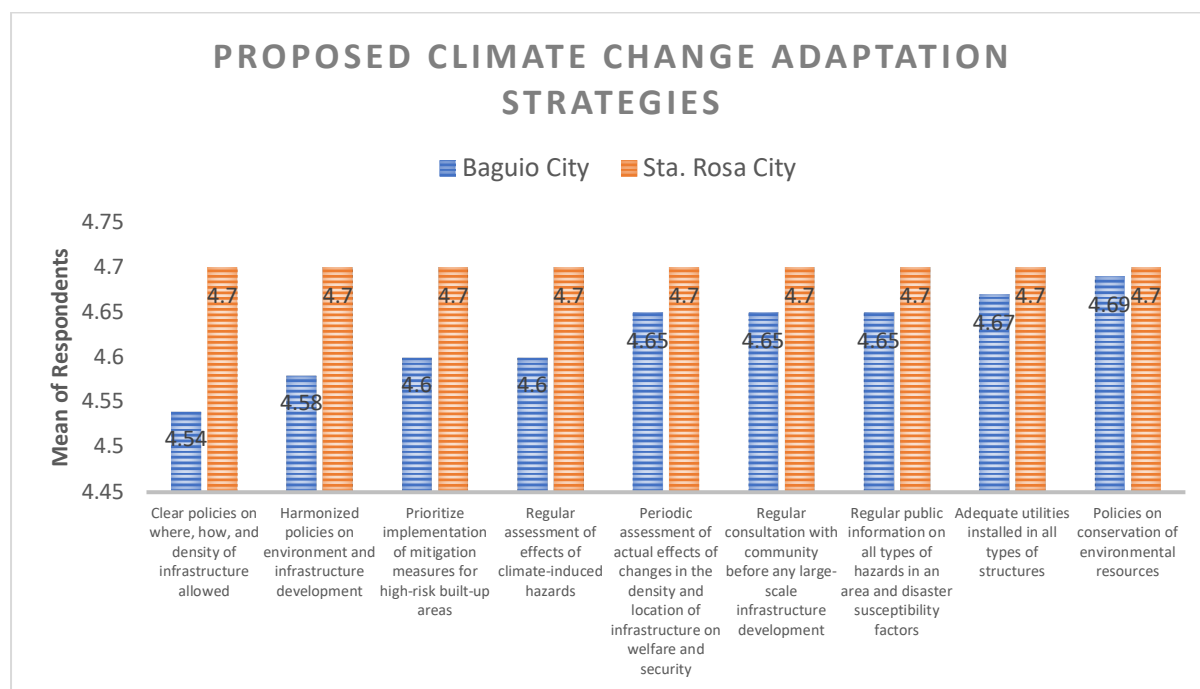


Chart 15. Proposed Climate Change Adaptation Strategies

7.2 Challenges to Environmental Impact Assessment

In terms of EIA, challenges arise from various reasons. One of which includes the fact that EIA is a project-focused activity wherein it suits more on a project that needs an evaluation and done by an expert. Another challenge is the acceptance and compliance of the stakeholders to the assessment. Results from this study showed a downfall regarding EIA compliance from 2007 to 2008 up to 2009. Out of 662 residential projects in Baguio City, only 22 or three percent complied and were subjected to EIA. The reason behind such results included ignorance, especially on the requirements, being unaware regarding the EIA, and absence of mandatory leveler or support from the local government unit of the area. In Sta. Rosa City, there is an unacceptable indicator to the project proponents to conduct the assessment.

7.3 Challenges to Land Use Planning

According to the respondents, the land use plan of the areas has no established policies concerning the use of land resources since the local government focuses more on the ground actions (e.g., actual relief, rescue, and rehabilitation operations). There is little consideration on policies regarding climate change impacts on residential sectors. Furthermore, there is no distinct section dedicated to high-risk areas. Thus, the zoning regulations assume equal standards and mechanisms for managing land resources.

In Baguio City, there were acknowledgments done by the interviewed authorities according to the LUP. One of which is that there is no explicit planning done at the broader scale since residential sectors grow mainly due to market-led forces such as business interests of real property developers. Moreover, public-led infrastructures were considered exempted in the

implementation of the land use plan. An example was when barangay halls were built near creeks and waterways. These pose a risk to the safety of the subjected persons.

Since Sta. Rosa City can offer various planned areas for settlements and businesses, there were positive feedbacks regarding the compliance of the residents on EIA and LUP. However, based on the interviewed authorities responsible for the plans, there is little control regarding the compliance of EIA and LUP when it comes to the informal settlements and small individual developments.

7.4 Challenges to EIA and LUP based on Author's Professional Experiences

This analysis is backed by the following developments and insights from years of professional experience by the author in conducting EIA and LUP in the Philippines:

- EIA results are a valuable information base for determining larger impacts of projects.
- EIA operations are reconfigured to fit changing demands toward sustainable resource use and management and inform local planning systems. This is gleaned from the DENR guidelines that underscore the critical role of LGUs in the EIA process.
- Local land use planning is a lot less structured as (than) the legislated EIA. Land use planning system can provide a better link to the former system.
- Decision models gleaned in the application of EIA are not absolute, and thus, can be improved with changes in the institutional environment where these operate, providing a backward link to LUP.
- Possible integration can be built on early initiatives to install strategic environmental assessment mechanisms at the policy level.

Chapter 8: Conclusion and Recommendations

8.1 Conclusion

This dissertation aimed to provide a comparative review of two decision-making tools that operate independently and are commonly used for climate change adaptation in the Philippines. Specifically, this study analyzed the practice of the project-focused EIA and established its link to LUP, as a decision-making tool at the local government level, towards the creation of sustainable cities and communities. By conducting an in-depth analysis of two case studies of flood- and landslide-prone residential communities, both subjected to the EIA process and situated in cities that have approved Comprehensive Land Use Plans (CLUP) and Zoning Ordinances, the author identified and concluded the relationship between the two systems and their possible integration areas to enhance the efficacy of planning and decision-making tools for the advancement of climate change-adaptive and -resilient development.

8.1.1 Relationship between the EIA and the LUP System

In order to provide a better understanding of the relationship between the EIA and the LUP systems, this study identified areas of complementation, similarities, and differences in terms of policy base, scope of application, process or methodology, institutional arrangements, and outputs.

Policy. According to their respective legal bases, the LUP, as a planning and regulatory tool, focuses on assuring the best and optimum use of land resources, while the EIA is recognized as a tool for the management of environment-related projects. Despite having entirely different policy backgrounds, both systems acknowledge the existence and importance of the other.

Scope of Application. While both the EIA and LUP aim for the conservation and proper utilization of natural resources, there is a significant difference in terms of the scope of application. The former deals explicitly with managing the potential environmental impacts of specific projects— those identified by law as environmentally critical projects and projects within environmentally critical areas that are proposed by the public or private sector, while the latter focuses on the management of land and water resources, and all human activities affecting it, at the city or municipal level. Both systems have in-place mechanisms for impact assessment, but the LUP employs a large-scale and general approach, while the EIA is project focused.

In terms of climate change impacts, the EIA focuses on project impacts on GHG emission and other hazardous substances that can compromise the quality and sustainability of the environment and natural resources, while the LUP covers how climate change impacts such as sea level rise, increase or decrease in rainfall, increase in number of hot days, among others, will affect the community in a particular locality. It should be noted, however, that neither

system has a mechanism for measuring cumulative impacts of development or climate change impacts on communities.

Process. Both planning tools are governed by “guidelines” in terms of the process or methodology and apply nationally legislated standards as planning parameters. The EIA and LUP both follow systematic albeit different approaches — the EIA revolves around project cycles, while the LUP is vision-oriented. The EIA is exhaustive about the possible impacts of a project from inception up to the actual operations through a science-based and rational procedure, given the complex nature of projects and their impacts, while the LUP, on the other hand, is comprehensive in the sense that it integrates, at the minimum, the economic, environmental, social, infrastructure, and institutional sectors.

Institutional Arrangements. In terms of institutional arrangements, the EIA is pursued by the national government, whereas LUP by local governments. Both the EIA and the LUP systems integrate the notion of community participation in their systems. Since the EIA focuses on project scope, the stakeholders involved in the process are substantially minimal compared to the LUP, wherein the entirety of the municipality or city and representations at the provincial and district level are involved. Although in different levels of involvement, both systems require the participation of the local government unit— in EIA as a provider of inputs especially concerning the project site, and in LUP as its central role in managing its territorial jurisdiction, which includes taking into consideration the EIAs of ECPs and projects in identified ECAs within the locality.

Outputs. The EIA and LUP are important planning documents in community development and are both required by local governments of the Philippines to initiate any land use development. The content of the outputs, however, differs significantly since the EIA presents an assessment of how a specific project will affect the environment and the corresponding management plan to lessen the project’s adverse effects or enhance its positive impacts, while the output of the LUP, on the other hand, focuses on zoning and land use regulations of the city or municipality. While the EIA and LUP follow two separate themes in the management of the natural environment, the EIA system, as a result of a science-based and rational analytical process, provides well-grounded environmental reasoning that can influence a political decision, which is generally the purview of the LUP. The limitation in scope and function of the EIA has resulted in difficulties in addressing challenges and issues that can only be addressed at the policy and strategic level. This presents an entry point for integration as the LUP is the policy-making process that deals with sustainability policies at the strategic level, but it has inadequate database and methodology for environmental impact assessment despite it being the primary tool for incorporating environmental considerations in the formal process of public decision-making.

Regarding climate change mitigation and adaptation, both the EIA and LUP have the potential to mitigate the impacts of climate-related hazards. However, only the EIA has an explicit measure of considering the impacts of a development on climate change and climate change

impacts on development, while the LUP does not have such measures by law or in practice. The EIA is viewed by both study areas as a regulatory tool, while the LUP is perceived as a “vague policy declaration”. However, the Zoning Ordinance, the regulatory tool accompanying the LUP, is deemed “more relevant” to the regulation of the development of land resources.

Table 8. Comparative Analysis of EIA and LUP in the Philippines

Feature	EIA	LUP
Policy Base	Recognized as a tool for the management of environment-related projects according to its legal basis. Acknowledges the existence and importance of LUP.	A planning and regulatory tool focusing on assuring the best and optimum use of land resources, based on its respective legal basis. Driven by broader development goals and local government codes. Acknowledges the existence and importance of EIA.
Scope of Application	Deals explicitly with managing the potential environmental impacts of specific projects (environmentally critical projects and projects within environmentally critical areas). Employs a project-focused approach for impact assessment. Focuses on project impacts on GHG emission and other hazardous substances. Does not have a mechanism for measuring cumulative impacts of development or climate change impacts on communities.	Focuses on the management of land and water resources and all human activities affecting it at the city or municipal level. Employs a large-scale and general approach for impact assessment (how climate change impacts (e.g., sea level rise, rainfall changes, hot days) will affect the community). Does not have a mechanism for measuring cumulative impacts of development or climate change impacts on communities.
Process or Methodology	Governed by "guidelines" and applies nationally legislated standards. Follows a systematic, project-cycle-oriented approach. Exhaustive about the possible impacts of a project from inception to operations through a science-based and rational procedure.	Governed by "guidelines" and applies nationally legislated standards. Follows a systematic, vision-oriented approach. Comprehensive in that it integrates, at minimum, the economic, environmental, social, infrastructure, and institutional sectors. Inadequate database and methodology for environmental impact assessment.
Institutional Arrangements	Primarily pursued by the national government (e.g., DENR-EMB). Stakeholders are substantially minimal due to project focus. Requires LGU participation as a provider of inputs concerning the project site. Integrates community participation.	Primarily pursued by LGUs. Involves the entirety of the municipality/city, with representations at provincial and district levels. LGU has a central role in managing its territorial jurisdiction, including taking into consideration EIAs of ECPs and projects in ECAs within the locality. Integrates community participation.
Outputs	Environmental Impact Statement (EIS) presenting an assessment of how a specific project will affect the environment and the corresponding management plan to lessen adverse effects or enhance positive impacts. Leads to an Environmental Compliance Certificate (ECC). Viewed as a regulatory tool.	Comprehensive Land Use Plan (CLUP) focusing on zoning and land use regulations of the city or municipality. Accompanied by a Zoning Ordinance, which is deemed "more relevant" to the regulation of land resource development. Perceived as a "vague policy declaration" by study areas.

8.1.2 Possible Areas for Integration and Preconditions

Opportunities for the integration of the EIA and LUP are identified based on the policy level, institutional level, process integration, and output integration as entry point for strategic environmental assessment.

Policy Level. At the policy level, there shall be a mandatory integration of EIA outputs in the LUP process through the following: a) legislative amendments shall be undertaken to explicitly link the two (2) systems; b) rational methods in climate impact assessment shall be adopted in LUP similar to that of EIA; and c) regulatory and monitoring tools shall be synchronized in terms of time and scope. In addition, given the vulnerability of the environment to climatic changes, development standards for high-risk areas must be made explicit based on geohazard and climate information.

Institutional Level. At the institutional level, local development councils (LDC) can expand their membership to include the EIA review committee. EIA review teams can likewise expand their members and consultation process to include LDC members. However, technical capacities of LUP authorities and planners shall first be strengthened to adopt more rational methods of impact assessment. Mechanisms for integrating concerned community representatives in EIA and LUP system shall also be defined to allow communities identified in high-risk areas to be well-represented regularly in planning and EIA review processes.

Process Integration. In terms of process integration, vertical and horizontal linkage in plans and processes can be achieved by first zeroing on spatial targets. The EIA and LUP consultations can be redefined for strategic actions for risk-prone communities to mitigate impacts, and common areas and indicators for monitoring and evaluating policies and actions in high-risk areas shall be formulated. In addition, there is a need to adopt rational methods of impact assessment at a cumulative scale by setting common indicators. Lastly, the integration of disaster management policies into EIA and LUP is deemed critical towards the attainment of climate change adaptive development.

Output Integration. To integrate the output of the EIA to the LUP, databases fused by both systems need to be reconciled and systematically updated. The EIA can also define the carrying capacity of high-risk zones. Information and data sharing shall shift from “case to case basis” to mandatory sharing of information to allow for the formulation of a risk-based land use plan and climate change adaptive zoning regulations. The output shall also include cumulative impact assessment for similar projects in a given area and existing residential structures that were not subjected to EIAs.

In summary, both the EIA and LUP fully acknowledge the relevance of climate change in land use and development in light of recent climate-related hazards/disasters. However, surveys and interviews perceive ineffective planning, both at the community and project level/scales. The EIA and LUP are presently fragmented systems pursued independently of each other due to

fragmented policies and processes and inadequate databases to estimate climate impacts on development. Positively, the EIA and LUP are potential planning tools to mitigate the impacts of climate change on land resource use and development.

Through the findings of this study, the author concludes that the Philippine EIA system can indeed influence land use planning decisions to cause risk-sensitive residential development. The integration of EIA principles and outputs into LUP is achievable through various pathways. While initial steps and significant improvements can be made at the local level through strengthened administrative practices and local ordinances, a truly comprehensive and mandatory integration that formalizes strategic environmental assessment principles for land use plans, and explicitly mandates climate and disaster risk integration within the national EIA framework, will necessitate targeted amendments to existing national legislation and policies.

Therefore, with a focus on key result areas such as refined planning parameters, clear policy prescriptions accompanied by spatial targets, and effective adaptation actions for risk-prone urban settlements, policy and institutional reforms with a view of retrofitting the planning process are recommended.

8.2 Recommendations

Based on the conclusion drawn from this study, it is clear that integrating the EIA system in land use planning is crucial in achieving climate-adaptive residential development in the Philippines. In light of this, this section presents recommendations for the effective integration of the EIA system in LUP towards climate change adaptation. The recommendations are bifurcated into two (2) main areas: (1) policy and institutional reforms, and (2) retrofitting the planning process. These recommendations aim to provide guidance and direction for policymakers, planners, and stakeholders engaged in land use planning and environmental impact assessment processes in the Philippines.

8.2.1 Policy and Institutional Reforms

1. The national government should develop and implement a climate-change adaptation-sensitive government policy and plan that integrates land and foreshore use zoning, alternative livelihood development, and eco-waste management. This policy and plan should prioritize the protection of vulnerable areas and promote sustainable land use practices that enhance the adaptive capacity of communities.
2. The national government should evaluate and prioritize proposed structural and non-structural options, including the provision of secure property rights and micro-finance/insurance schemes, that enhance the adaptive capacity of vulnerable groups. This will ensure that vulnerable communities have access to the necessary resources and support to adapt to the impacts of climate change. Further, it will promote community resilience and participation since non-structural approaches often involve

capacity building and community engagement. Prioritizing these encourages local ownership of adaptation efforts, increasing their effectiveness and sustainability. The evaluation of community preferences also leads to socially acceptable solutions.

3. The national and local governments should review the existing government Calamity Fund allocation to cover disaster preparedness and local adaptive capacity development. This will ensure that the necessary resources are allocated to disaster preparedness and climate change adaptation measures. This also enhances accountability and transparency since regular review promotes fiscal responsibility, preventing misuse or misallocation. It builds public trust by demonstrating that disaster funds are used appropriately and efficiently.

The review of calamity fund allocation also allows flexibility in crisis situations since it helps unutilized or underutilized funds that can be redirected quickly during actual emergencies. It also enhances timeliness and effectiveness of response actions.

4. Local governments should examine the potential synergy of existing local institutional mechanisms for disaster risk management, common resource management, and community-based adaptation. This should include a review of the roles and responsibilities of different stakeholders involved in land use planning and environmental assessment processes, with a view to enhancing collaboration and coordination among them. This provides opportunities for the local communities to be involved in the decision-making processes related to land use planning and environmental assessment, and that their needs and concerns are taken into consideration.
5. The ongoing efforts to refine the Philippine Environmental Impact Assessment (EIA) Law underscore a significant national commitment to strengthening environmental governance. Notably, **House Bill No. 11093, the proposed Philippine Environmental Assessment System Act**, presents a pivotal legislative initiative. This bill seeks to institutionalize Strategic Environmental Assessments (SEA), fundamentally extending environmental review beyond mere project-level Environmental Compliance Certificates (ECCs) to encompass comprehensive policies, plans, and programs. This expansion signifies a strategic shift towards more proactive, upstream environmental integration, aimed at inherently informing development decisions from their inception. Furthermore, the proposed Certificate of Proponent's Environmental Commitment (CPEC) in HB 11093 aims to enhance accountability post-ECC issuance, while provisions for more robust public participation and multi-partite monitoring mechanisms seek to elevate transparency and collective oversight.

As these substantive legislative advancements unfold, the critical juncture emerges to ensure their effective operationalization within the existing planning ecosystem. While these reforms are designed to bolster environmental protection and climate resilience, fully realizing their transformative potential necessitates granular attention to strengthening the clear, systematic linkage and practical integration of the refined EIA

system into local land use planning processes, particularly for climate-adaptive residential development. This research, therefore, offers timely and empirical insights, precisely outlining actionable pathways and refined methodologies that can bridge current operational gaps and effectively translate these commendable policy innovations into tangible, resilient, and equitably developed communities on the ground.

8.2.2 Retrofit Planning Process

The presence of a significant number of population residing on slopes prone to landslides necessitates the establishment of a comprehensive program that identifies at-risk areas and settlements, and implements measures to minimize these risks. For cities to effectively address the risks posed by natural disasters, well-conceived disaster-risk management plans are essential. Such plans must not only aim to reduce disaster risk, but also provide appropriate responses when disasters occur. Integrating disaster risk reduction into urban development decisions is essential to achieve successful and sustainable development. This integration can and should be carried out as an integral element of the development process.

Furthermore, proactively addressing accumulated risks arising from rapid urban growth is of paramount importance, involving strategies such as retrofitting existing houses and improving critical infrastructure. These efforts provide a vital platform for establishing institutional and organizational frameworks that facilitate the seamless integration of climate change adaptation into urban planning. In this context, the strategic integration of Environmental Impact Assessment into Land Use Planning is unequivocally essential for achieving climate-adaptive residential development in the Philippines. EIA serves as a critical, forward-looking tool for systematically identifying and mitigating environmental and climate-related risks associated with urban development, thereby leading to the creation of more resilient and sustainable communities.

8.3.2.1 Proposed Entry Points for EIA Integration in the 12-Step CLUP Process

The effective operationalization of strategic environmental considerations, particularly pertaining to climate and disaster risk, within local land use planning necessitates the implementation of specific strategies at each identified entry point within the CLUP process. This approach is designed to transition from a reactive, project-specific EIA paradigm towards a proactive, strategic environmental assessment framework, thereby ensuring environmental considerations intrinsically inform planning decisions from their inception. This framework identifies specific integration points within **CLUP Steps 4, 5, 6, 7, 8, 11, and 12** to embed environmental and climate considerations directly into its core. Crucially, this approach transcends the traditional Environmental Management and Disaster Risk Reduction sectors by systematically applying proactive environmental assessment and climate science across key stages of the CLUP planning continuum.



Figure 6. Proposed EIA Integration Points in the CLUP Process

Source: Author's Construct

- **CLUP Step 4: Analyze the Situation**

A critical entry point for integrating environmental and climate considerations occurs during the analysis of the LGU's current situation. This involves conducting a rigorous analysis of existing EIA data, Ecological Baseline Assessments (EBA), and CDRA, complemented by downscaled climate projections. The objective is to establish a comprehensive environmental and cumulative risk profile for the LGU. This foundational step requires a systematic collection and integration of high-resolution EBA data (covering air, hydrology, ecosystems, geology, soil, and waste) with predictive CDRA, which includes multi-hazard mapping, locally downscaled climate projections for future hazards, vulnerability and exposure assessments, and adaptive capacity evaluations. A specific focus must be on identifying and mapping 100% of critical infrastructure and its precise hazard exposure. Furthermore, a centralized digital repository for all LGU-jurisdiction EIA reports (EIS/IEE) should be formalized, supported by local mandates for proponent submission and formalized agreements with DENR-EMB for systematic data sharing. This rich dataset

then becomes instrumental for conducting cumulative impact analysis, validating environmental carrying capacity, and assessing the effectiveness of past mitigation measures.

- **CLUP Step 5: Formulate Goals and Objectives**

Following a thorough situational analysis, environmental and climate considerations become paramount in formulating the LGU's goals and objectives. This phase's entry point involves defining environmental sustainability, DRR-CCA goals and objectives with quantifiable resilience outcomes, directly informed by the comprehensive analysis conducted in the previous step. It is essential to systematically translate EBA and CDRA findings into specific, measurable, achievable, relevant, and time-bound (SMART) objectives. These objectives must be explicitly calibrated against locally downscaled climate change projections (e.g., from PAGASA) to ensure they are future-proofed and adequately address anticipated climate impacts. Ultimately, these objectives will provide clear EIA guiding principles and performance expectations for all future developments, all geared toward achieving the defined resilience.

- **CLUP Step 6: Establish Development Thrust and Spatial Strategies**

At the stage of establishing development thrusts and spatial strategies, the framework introduces the mandatory strategic environmental and climate performance evaluation for all proposed spatial alternatives. This serves as a critical entry point to proactively analyze environmental and climate risks associated with different development scenarios, ultimately guiding the selection of optimal strategies that achieve desired resilience outcomes. A local ordinance should be enacted to mandate comprehensive evaluation for all CLUP spatial alternatives. The scope of this evaluation must systematically assess the environmental performance and climate/disaster risk implications of various scenarios (e.g., concentrated versus dispersed growth), explicitly evaluating their capacity to meet defined resilience objectives informed by downscaled climate projections. A structured analytical framework is essential to predict impacts (including resource footprint, pollution loads, ecosystem impacts, and GHG trajectory) for each alternative. This framework should also assess their climate vulnerability against projected hazards, conduct ex-ante cumulative impact analysis, perform risk-based scenario analysis, and utilize multi-criteria decision analysis for transparent comparison. Priority should be given to strategies that minimize environmental degradation, reduce greenhouse gas emissions, and decrease vulnerability and exposure (often referred to as "no-regrets/low-regrets" options), while consistently respecting carrying capacity limits and directly contributing to resilience. The entire process must be documented in a comprehensive "Strategic Environmental and Climate Performance Report", subject to expert and public validation.

- **CLUP Step 7: Prepare the Land Use Plan**

The preparation of the land use plan represents a crucial entry point for translating the evaluation findings into tangible spatial designations. This involves delineating precise mapped land use categories, including ECAs, hazard zones, and Climate-Adaptive Development Areas (CADAs), all aimed at establishing environmental parameters and achieving resilience. The land use plan should be evaluation-driven and risk-informed, directly mapping and protecting ECAs and other sensitive zones. High-resolution multi-hazard maps from the CDRA (informed by downscaled climate projections) must be integrated to formally delineate Absolute No-Build Zones, Controlled Development Zones (which come with stringent development conditions), and Managed Retreat Zones. Furthermore, climate-adaptive spatial planning requires proactively designating Climate-Adaptive Development Areas (CADAs) as resilient growth zones. Policies that promote nature-based solutions and incentivize green infrastructure (such as permeable surfaces, bioswales, and urban forests) within all development types should be integrated to enhance natural drainage and mitigate urban heat, thereby contributing to overall resilience. Finally, quantifiable policy statements reflecting and enforcing environmental carrying capacity limits must be formulated, alongside robust resource management policies and mechanisms for inter-LGU coordination to address trans-boundary impacts.

- **CLUP Step 8: Draft the Zoning Ordinance**

Drafting the Zoning Ordinance is a pivotal entry point for codifying the environmental and climate resilience goals into legally binding regulations. The ordinance must include explicit environmental performance standards, climate-resilient building codes, and hazard-zone prohibitions. This involves directly transposing "Absolute No-Build" and "Highly Restricted Development" Zones into explicit, legally binding zoning classifications. Environmental Protection Overlay Zones (EPOZs) or Hazard Overlay Zones (HOZs) should be established with restrictive regulations, all based on downscaled climate projections and detailed hazard assessments. Furthermore, the ordinance must embed quantifiable Environmental Performance Standards (EPS), such as maximum impervious surface ratios, water efficiency, and waste management requirements, alongside robust Climate-Resilient Building Codes. It is critical to formally adopt and integrate specific Infrastructure Resilience Standards, including hazard-specific building codes and design standards (e.g., structures resilient to defined wind speeds, seismic loads, and mandatory flood-proofing for critical facilities and structures in identified flood zones), ensuring alignment with the established resilience objectives. An Integrated Compliance Framework should be implemented, explicitly stating the ECC as an absolute prerequisite for all local development and occupancy permits. Local permitting processes must be streamlined to trigger a mandatory LGU-level environmental review by the M/CENRO to confirm compliance with both the Zoning Ordinance and ECC conditions. Provisions for post-construction environmental auditing and continuous monitoring are also essential. Finally, the ordinance should include adaptive provisions that define triggers for periodic

zoning review or reclassification based on updated data and establish stringent criteria for variances to ensure no compromise to environmental goals or increased risk.

- **CLUP Step 11: Implement the CLUP and ZO**

The implementation phase is where the environmental and climate mandates of the CLUP are operationalized. This involves integrating EIA requirements into the LGU's permitting and enforcement processes, establishing robust local monitoring, driving strategic green investments, and building necessary capacities to achieve defined resilience objectives. An Integrated Permitting & Enforcement system is fundamental, where the ECC serves as a gatekeeper for all local permits. The M/CENRO must be empowered to conduct mandatory LGU-level environmental reviews and establish robust environmental monitoring protocols to ensure compliance with ECC conditions and Zoning Ordinance standards.

Clear enforcement frameworks, complete with appropriate penalties for non-compliance, are vital. Furthermore, strategic resilience investments must orient the LGU's AIP to prioritize climate-adaptive capital investments (e.g., flood control infrastructure, resilient transport systems). It is paramount to prioritize and allocate resources for comprehensive protection measures for 100% of identified critical infrastructure, ensuring their enhanced resilience against all mapped climate and disaster hazards, thereby directly contributing to overall resilience. The LGU should also design local green investment incentives and actively pursue climate finance opportunities, such as the PSF. Finally, sustained capacity building is indispensable, requiring ongoing, specialized training for LGU personnel on CLUP environmental provisions, EIA application, environmental monitoring, and climate data interpretation. Public awareness campaigns on environmental compliance and resilience are also key.

- **CLUP Step 12: Monitor and Evaluate the CLUP and ZO**

The final and ongoing step involves establishing a robust environmental performance M&E system. This system will track Key Environmental Indicators (KEIs), Climate Resilience Metrics (CRMs), and ECC/ZO compliance, using findings to mandate adaptive management and evidence-based plan updates for continuous progress towards resilience. The comprehensive environmental monitoring component requires developing precise quantifiable KEIs (e.g., air/water quality, forest cover, waste diversion rates) and Climate Resilience Metrics directly linked to the calibrated resilience objectives (e.g., reduced exposure to hazards, economic loss reduction). A GIS-based environmental performance platform should be developed for spatial analysis and reporting, capable of integrating real-time data. Rigorous compliance oversight entails conducting mandated compliance audits of projects to verify adherence to ECC conditions and Zoning Ordinance standards. Evaluating enforcement effectiveness and reviewing lessons learned from EIA post-audits are also critical. Finally, adaptive plan management necessitates establishing a mandated

periodic review cycle for the CLUP and Zoning Ordinance (e.g., every 3-5 years). Findings from environmental monitoring (KEIs/CRMs) and compliance audits must serve as the primary evidence base for data-driven revisions, ensuring continuous progress toward resilience informed by updated climate projections.

8.3.2.2 Moving Forward: A Holistic Approach

This integrated approach ensures a CLUP that is not only compliant but strategically optimized for sustainable development, effective resource management, and enhanced community resilience, with resilience objectives firmly grounded in downscaled climate projections. It is essential to acknowledge that while this strategic integration of EIA and climate resilience into LUP is an unequivocally essential and foundational pathway, **it is not the sole or exclusive pathway**. It functions optimally within a broader, multi-faceted national and local strategy for DRR-CCA, complemented by community programs, targeted infrastructure projects, financial mechanisms, capacity-building, and ecosystem-based adaptation initiatives.

The integration of EIA into LUP is essential for protecting natural resources, ensuring sustainable development, reducing disaster risks, and promoting inclusive decision-making. It turns planning from a short-term economic tool into a long-term, resilient, and environmentally conscious strategy.

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This dissertation unequivocally concludes that the prevalent fragmented approaches to EIA and LUP in the Philippines critically hinder climate resilience against escalating impacts. Through rigorous analysis, this study identified a transformative path: holistic integration of EIA principles and advanced climate science across all levels of land use planning-- policy, institutional, process, and output. This comprehensive approach, encompassing detailed frameworks and essential reforms, empowers local governments to shift from reactive mitigation to proactive, risk-sensitive urban development. Ultimately, this research provides a vital blueprint for cultivating sustainable and climate-adaptive cities across the country, effectively reducing their vulnerability and enhancing their capacity to withstand projected climate change impacts.

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APPENDICES

Appendix 1. Key Informant's Interview (KII) Interview Guide

Dear Respondent:

I am undertaking a dissertation as part of my doctoral study in Spatial Planning at the Technical University of Dortmund, Germany. My research seeks to explore the integration of two environmental assessment systems, specifically the Environmental Impact Assessment (EIA) and Land Use Planning System, towards developing adaptation strategies for Climate Change in urban settlements.

At present, little research has been conducted on into the opinions of stakeholders and decision-makers. However, as they are the individuals involved in the development and implementation of environmental and land use policies, I feel that their views on this issue are most critical. To achieve this, I have developed a questionnaire on how these systems presently address the challenges of climate change, which I hope you can find the time to complete. The information will be invaluable to my dissertation.

I would like to assure you of the confidentiality and anonymity you will receive if you agree to take part in this survey, consistent with the ethical code upheld by the University.

I very much hope you will be able to help me with this research. If you require any further information, please contact me at 0917-5352745.

Yours sincerely,

CARMELITA R.E.U. LIWAG

I. BACKGROUND

Age:		Sex:	<input type="checkbox"/> Male	<input type="checkbox"/> Female
EIA Participated in:	<input type="checkbox"/> EIA	<input type="checkbox"/> Local Land Use Regulations (zoning, building regulations, investment programming & implementation)		
1. What is your current professional affiliation?	<input type="checkbox"/> Local Government <input type="checkbox"/> National/ Regional Government <input type="checkbox"/> NGO <input type="checkbox"/> Private/ Professional Research Organization <input type="checkbox"/> Academe <input type="checkbox"/> Private sector (e.g. business or professional organizations) <input type="checkbox"/> Other (please specify) _____			
2. What is your job title?				
3. How long have you been in your position?				
4. What is the scope of your responsibility? Please check all that apply.				
<input type="checkbox"/> Coordination with sectors for land use planning <input type="checkbox"/> Sector development research <input type="checkbox"/> Planning inventories and needs analysis <input type="checkbox"/> Zoning regulations enforcement <input type="checkbox"/> Buildings/ Development regulation (e.g., permitting process, demolition of illegal structures, ECC processing) <input type="checkbox"/> Environmental compliance monitoring/pollution control <input type="checkbox"/> Legislative research for zoning and development regulations		<input type="checkbox"/> Road construction, restoration and maintenance <input type="checkbox"/> Public drainage system management <input type="checkbox"/> Solid Waste Management <input type="checkbox"/> Sewage Treatment System Management <input type="checkbox"/> Hazard Monitoring <input type="checkbox"/> Disaster Management (preparation, early warning, response, relief, rehabilitation) <input type="checkbox"/> Community risk assessment <input type="checkbox"/> Others, please specify _____		

II. VIEWS ON CLIMATE CHANGE

Climate change: Any long-term significant change in the 'average weather' of any given region

5. How well informed are you about Climate Change?	<input type="checkbox"/> Very <input type="checkbox"/> Somewhat <input type="checkbox"/> A little <input type="checkbox"/> Not at all
--	--

6. Are you concerned about the possible impacts of climate change in the city/community?	<input type="checkbox"/> Yes <input type="checkbox"/> No
--	---

7. What changes have you observed in your community now compared to the past years? Please mark accordingly: 5 = Improves; 4 = Slightly Improved; 3 = No Change; 2 = Slightly Worsened; 1 = Worse

	5	4	3	2	1
a. Distance between neighborhood structures					
b. Distance of structures and activities from roads and water bodies (if any)					
c. Vehicular traffic					
d. Growth of commercial structures/ establishments					
e. Cleanliness of surroundings					
f. Air quality					
g. Water supply level					
h. Job Opportunities					
i. Predictability of weather patterns (e.g. rainfall volume & period, temperature during summer months)					
j. Utilities (drainage, sewer, power, communication)					
k. Water level of creeks/ rivers					
l. Incidence of landslide					
m. Incidence of flooding					

8. What do you think is the primary cause of climate change?	<input type="checkbox"/> Natural processes <input type="checkbox"/> Human activity	<input type="checkbox"/> Both natural and human processes <input type="checkbox"/> Don't Know
--	---	--

9. Do you think the effects of climate change is a situation best described as a crisis, a major problem but not a crisis, a minor problem, or is it not a problem at all?	<input type="checkbox"/> A major crisis <input type="checkbox"/> Minor problem	<input type="checkbox"/> Not a problem <input type="checkbox"/> Don't know
--	---	---

10. Please cite the three (3) most pressing issues or challenges in your job when it comes to climate change?

11. Please choose the answer that best represents your opinion. The state of the built environment affects the degree of climate-related disaster in the city/community?	<input type="checkbox"/> Strongly Agree <input type="checkbox"/> Slightly Agree <input type="checkbox"/> Neutral	<input type="checkbox"/> Slightly Disagree <input type="checkbox"/> Strongly Disagree
--	--	--

III. CAPACITY TO MANAGE CLIMATE IMPACTS THRU LAND USE REGULATORY TOOLS (EIA, Zoning, Building Regulations, Investment Programming)			
<i>Climate change: Any long-term significant change in the 'average weather' of any given region</i>			
12. Do you use any climate-related data or information in your job	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
<i>If yes, answer the following:</i>			
12.1 What types of data or information do you use?	<input type="checkbox"/> Climate scenarios or projections <input type="checkbox"/> Climate variability monitoring reports <input type="checkbox"/> Geohazard assessment report <input type="checkbox"/> Vulnerability of communities to hazards	<input type="checkbox"/> Disaster monitoring reports <input type="checkbox"/> Status of water-related infrastructure <input type="checkbox"/> Environmental quality report <input type="checkbox"/> Others, please specify. _____	
12.2 What are the bases or sources of these data?	<input type="checkbox"/> Reports from other agencies <input type="checkbox"/> Reports from other local departments <input type="checkbox"/> Thru primary data gathering tools like GIS, local researches conducted by your office (by administration or external consultants) <input type="checkbox"/> International sources <input type="checkbox"/> Others, please specify. _____		
12.3 Where do you use these data	<input type="checkbox"/> Only when needed <input type="checkbox"/> Seldom <input type="checkbox"/> Regularly	<input type="checkbox"/> Often <input type="checkbox"/> Always	
12.4 Where do you use these data?	<input type="checkbox"/> Identification of priority intervention or investment areas <input type="checkbox"/> Goal setting for development plans <input type="checkbox"/> Developing strategies for land use regulations	<input type="checkbox"/> Setting of targets for plans and/or projects <input type="checkbox"/> Review of project design <input type="checkbox"/> Drafting guidelines on project management and implementation <input type="checkbox"/> Others, please specify. _____	
13. Please rate adequacy of policies/ laws that support your mandated functions in relation to addressing climate change impacts: 1 = Lacking 2 = Inadequate 3 = Adequate			
a. Goal/ objectives on climate adaptation			
b. Data for measuring climate change impacts			
c. Tools for measuring climate change			
d. Identifying location of hazards			
e. Targets for climate adaptation			
f. Programs/ projects/ activities for climate adaptation			
g. Mechanisms or means of involving the public			
h. No. of staff that should be involved in the enforcement of said policies			
i. Capacity of implementing staff			
j. Time frame of adaptation strategy or plan implementation			
k. Budget for adaptation programs and projects			
l. Coordination mechanism with other agencies and organizations			
m. Monitoring and evaluation system for climate adaptation programs/ projects			
n. Coordination with other regulatory systems			
14. What do you think will be the issues of greatest concern related to climate change for the city in the next few decades in the following areas			
Physical/built environment: _____			
Natural environment: _____			

Public Safety:	
Local economy:	
Capacity of Government to Address Climate Change Impacts:	
15. Please indicate the corresponding number that best represents your opinion: 5 = Strongly Agree; 4 = Slightly Agree; 3 = Neutral; 2 = Slightly Disagree; 1 = Strongly Disagree	
a. Land use regulations (e.g. EIA, zoning, building regulations) should be dealt with as a distinct and separate concern from climate change impacts	
b. There are expressed zoning and development policies for low-intensity development in areas of high vulnerability to natural hazards. (Examples of such policies: cluster zoning to keep structures from being built in floodplains, landslide-prone areas, land acquisition priorities for high hazard areas, etc.)	
c. Lands vulnerable to natural hazards are either undeveloped or developed at less than permissible intensity	
d. Additional standards or development regulations other than the national minimum standards are imposed for hazard-prone areas and buffer zones	
e. Capital improvements and critical facilities are implemented in lands most vulnerable to natural hazards	
f. The city protects open spaces in vulnerable areas to protect it from development	
g. There are policies for requiring reconstruction and redevelopment to meet all current natural hazard mitigation criteria	
h. Special assessments or impact fees to recover the costs of mitigation, response and recovery are clearly incorporated in planning and project development	
i. Existing development projects in hazardous areas are either redesigned to reduce vulnerability, made to conform to zoning and environmental regulations or relocation)	
j. Land use regulations reassess risks following a disaster	
k. Information on the vulnerability to natural hazards for specific areas is disclosed to community members	
l. Communities at risk are involved in land use planning or environmental assessment of specific projects	
m. There is ongoing public education about and awareness of natural hazard vulnerabilities	
16. What are your primary interests related to climate change adaptation? (Select up to 5)	
<input type="checkbox"/> Hard adaptation measures (physical investments, adjustments) <input type="checkbox"/> Soft adaptation measures (policy, planning, information, capacity building) <input type="checkbox"/> Community-scale projects (e.g., disaster management training for communities at risk, community infrastructure support) <input type="checkbox"/> 'Mainstreaming' climate change risks into agency procedures <input type="checkbox"/> 'Mainstreaming' climate change risks into national plans/policies/programmes <input type="checkbox"/> Integration of climate change risks across sectoral themes (e.g. health, disaster, etc.) <input type="checkbox"/> Integration of EA processes involving residential development <input type="checkbox"/> Financing for adaptation measures <input type="checkbox"/> Assessment of climate change risks and adaptation responses, or establishment of local adaptation frameworks <input type="checkbox"/> Other (please specify)	
17. What are the constraints to developing climate adaptation strategies?	
18. Please rate the level of security of settlements or built environment from the effects of cyclones/ typhoons? 5 = Very secure; 4 = Somewhat secure; 3 = Uncertain; 2 = Somewhat unsecure; 1= Very unsecure	
_____ Before typhoon Pepeng/Ondoy	_____ After typhoon Pepeng/Ondoy
Why?	
.....	
THANK YOU.	

Appendix 2. Interview Guide

Dear Respondent:

I am conducting a study on land use and environmental assessment practices in the country in relation to Climate Change impacts in line with my doctoral studies on Spatial Planning at the Technical University of Dortmund, Germany. Further, the study will be submitted to a forum on Climate Change Adaptation in Dresden, Germany this October. Baguio City and Sta. Rosa, Laguna are the study areas.

For this survey, I would like to gauge the perception of the residents on how the public sector manages the effects of climate-related hazards such as landslides and flooding on the built environment.

I would sincerely appreciate if you can spare some time to answer these questions. Rest assured that your identity and responses will be kept in utmost confidence, in accordance with ethical policies on academic researches of the University.

God Bless.

CARMELITA R.E.U. LIWAG, EnP.

Assistant Professor, School of Urban and Regional Planning
UP Diliman, Quezon City

I. RESPONDENT INFORMATION

Age:		Sex:	<input type="checkbox"/> Male	<input type="checkbox"/> Female
Educational Attainment:	<input type="checkbox"/> Elem Level	<input type="checkbox"/> College Level	<input type="checkbox"/> Post- Graduate Level	
	<input type="checkbox"/> HS Level	<input type="checkbox"/> Graduate Level	<input type="checkbox"/> Vocational/ Tech Educ.	
Occupation:				
Years of Residence in the City	<input type="checkbox"/> 0-3 yrs	<input type="checkbox"/> > 5 but	<input type="checkbox"/> > 7 but < 10 yrs	
	<input type="checkbox"/> > 3 but < 5 yrs	<input type="checkbox"/> < 7 yrs	<input type="checkbox"/> >10 yrs & more	

II. QUESTIONS

1. What can you remember most about the effects of typhoon Pepeng/ Ondoy in your community/ district? Please check all that apply.			
<input type="checkbox"/> Non-stop rains	<input type="checkbox"/> Damaged houses	<input type="checkbox"/> Damaged utilities (power, communication, sewer, drainage)	
<input type="checkbox"/> Landslides/ Erosion	<input type="checkbox"/> Damaged roads	<input type="checkbox"/> Others, please specify	
<input type="checkbox"/> Flooding	<input type="checkbox"/> Schools & businesses closed	_____	
2. What can you remember immediately after the typhoon?			
3. Can you say the effects of typhoon Pepeng/ Ondoy were much worse than the other typhoons that hit your community?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
4. What changes have you observed in your barangay/ district before typhoon Pepeng/Ondoy now compared to the past years? Please mark accordingly: 1 = Improved; 2 = Slightly improved; 3 = No change; 4 = Slightly worsened; 5 = Worse-off			

a. Distance between neighborhood structures			
b. Distance of structures and activities from roads and water bodies (if any)			
c. Vehicular traffic			
d. Growth of commercial structures/ establishments			
e. Cleanliness of surroundings			
f. Air quality			
g. Potable water supply			
h. Job Opportunities			
i. Predictability of weather patterns (e.g. rainfall volume & period, temperature during summer months)			
j. Utilities (drainage, sewer, power, communication)			
k. Physical stability of ground/ land			
l. Water level of creeks/ rivers			
m. Predictability of weather patterns (e.g. rainfall volume & period, temperature during summer months)			
n. Utilities (drainage, sewer, power, communication)			
o. Physical stability of ground/ land			
p. Water level of creeks/ rivers			
4.a. Do you think these changes in a way worsened the effects of Pepeng/Ondoy?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
5. Are you aware if there are parts of your barangay/ district that are prone to landslide and/or flooding?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
5.a If yes, how did you learn about these?	<input type="checkbox"/> By experience or have seen it myself <input type="checkbox"/> From other residents	<input type="checkbox"/> Informed by non-government people <input type="checkbox"/> Informed by government	
6. Do you think the government was prepared for the effects of Pepeng/Ondoy?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
7. Please rate the preparedness of these levels of government to minimize the effects of strong typhoons such as Pepeng/Ondoy? 1 = Well prepared, 5 = Unprepared		<input type="checkbox"/> Barangay Level <input type="checkbox"/> City/Municipal Level <input type="checkbox"/> National Government Level	
8. Are you aware of any forum or gathering in the community or at the city level where people talk about how the growing number of infrastructures in the city can affect the natural environment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No Comment
9. Are you aware of any regulations on how and where infrastructures (house, building, roads and utilities) should be built in the city?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No Comment
10. Are you aware of any large infrastructure like commercial or residential building, subdivisions, major roads, and similar structures built in your barangay/ district in the past 3 years or more?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> No Comment
10.1 If yes, would you know if there was any consultation about it before it was built?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
10.1a If yes, did the organizer of the forum discuss the positive and negative impacts of the project on your community?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
10.1b If No, do you think it is important that the community is informed about the impacts of these projects on the environment?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Don't know
If Yes or No, Why?			

<p>11. Having seen the effects of Pepeng/ Ondoy and the changes in your community, please rate your level of safety and security from the impacts of such kind of disaster? 1 = Safe and secure; 2 = Uncertain; 3 = Threatened</p>	<p>_____ Before Typhoon Pepeng/ Ondoy _____ After Typhoon Pepeng/ Ondoy</p>
--	---

12. To promote a safe and secure place to live, do you think government should (please check all that apply)

- Set clear policies on where, how and how many houses, buildings and infrastructure should be built
- Better protect trees, green open spaces and waterways
- Install adequate utilities
- Measure the impacts of hazards on the life and property
- Coordinate with other agencies and harmonize their policies on environment and development
- Inform the public regularly of any hazards in their area and what factors can induce their susceptibility to such hazards
- Consult the public before allowing any large infrastructure or a cluster of structures
- Ensure the implementation of mitigation measures for built areas that are already at risk
- Monitor the actual effects of development projects or changes in infrastructure on people's welfare and security
- Others, please specify. _____

13. What could the community residents have done to help reduce the effects of Pepeng/Ondoy? Please mention three (3)

14. If given a choice, where else in the Philippines would you want to live and why?

THANK YOU FOR YOUR TIME.

Appendix 3. Chronology of Crucial Policies Related to EIA System in the Philippines

Law/ Policy	Remarks
Presidential Decree No. 1151	Provided Environmental Impact Statement for every proposed project and undertaking deemed significantly affecting the quality of the environment
Presidential Decree No. 1586	Empowered the President to declare certain projects, undertakings, or areas in the country as environmentally critical, and to prohibit the undertaking or operating of such environmentally critical projects without first securing an Environmental Compliance Certificate (ECC) issued by the President or his/her duly authorized representative
Proclamation No. 2146, series 1981	Proclaimed Certain Areas and Types of Projects as Environmentally Critical and Within the Scope of the Environmental Impact Statement System Established Under Presidential Decree No. 1586
Proclamation No. 803	Declaring the Construction, Development and Operation of a Golf Course as an Environmentally Critical Project Pursuant to PD 1586
Executive Order No. 192	Providing for the Reorganization of the Department of Environment, Energy and Natural Resources, renaming it as the Department of Environment and Natural Resources, and for other purposes, the EMB was created, one of whose primary functions include recommending <i>rules and regulations for EIA and providing technical assistance for their implementation and monitoring.</i>
Executive Order No. 292	EMB function was emphasized
EO 291, series 1996	Improving the Environmental Impact Statement System
Administrative Order (AO) 42, series 2002	Rationalizing the Implementation of the Philippine Environmental Impact Statement (EIS) System and Giving Authority in addition to the Secretary of the DENR, to the Director and Regional Directors of the EMB to Grant or Deny the Issuance of ECCs)
DENR-Department Administrative Order (DAO) 2003-30	Formulating the Implementing Rules and Regulations (IRR) for the Philippine Environmental Impact Statement (EIS) System
DENR- Memorandum Circular (MC) 2007-002	Revising the Procedural Manual (RPM) for IRR, promulgated by/contained in, prescribing the procedures for the processing of applications for Environmental Compliance Certificates (ECCs) and Certificates of Non-Coverage (CNCs) within the timeframes specified in AO 42.

Memorandum Circular 2007-08	Simplifying the Requirements for Environmental Compliance Certificate or Certificate of Non-Coverage Applications
Memorandum Circular 2008-08	Clarification of the Role of LGUs in the Philippine EIS System in Relation to MC 2007-08
Memorandum Circular 2010-14	Standardization of Requirements and Enhancement of Public Participation in the Streamlined Implementation of the Philippine EIS System

Appendix 4. Scope of the System

Single Project Groupings				
<p>GROUP I: ECPs in either ECAs or NECA (Environmentally Critical Projects in either Environmentally Critical Areas or Non-Environmentally Critical Areas). These are project types declared through Proclamation Nos. 2146 and 803 with technical descriptions provided by NEPC Circular No. 3 of 1983 and updated by EMB with DTI concurrence on 6 July 2004 as authorized by Sections 2-D and 3-A of AO 42 (2002): ALL Golf Course projects; Heavy Industries, Fishery, Logging and Grazing projects with EIS requirement (with highest potential level of significance of impact); ALL projects introducing exotic fauna in public and private forests; MAJOR wood processing; MAJOR mining and quarrying projects and MAJOR listed infrastructure projects. There are currently a total of 37 listed project types in Group 1, all with EIS requirement.</p>				
<p>GROUP II: NECPs in ECAs (Non-Environmentally Critical Projects in Environmentally Critical Areas). These are Heavy Industries, Fishery, and Logging projects with IEE as the highest documentary requirement (with moderate to nil significance of impact); MINOR wood processing projects, MINOR mining and quarrying projects, MINOR infrastructure projects in the same project types as listed in Proc No. 2146, as well as 16 additional project types which may be located in any of the 12 ECAs. There are currently 118-listed project types under Group II.</p>				
<p>GROUP III: NECPs in NECA (Non-Environmentally Critical Projects in Non-Environmentally Critical Areas). These are ALL Group II project types outside ECAs. Co-located Projects</p>				
<p>GROUP IV (Co-located Projects in either ECA or NECA): A co-located project is a group of single projects, under one or more proponents/locators, which are located in a contiguous area and managed by one administrator, who is also the ECC applicant. The co-located project may be an economic zone or industrial park, or a mix of projects within a catchment, watershed, or river basin, or any other geographical, political, or economic unit of area. Since the location or threshold of specific projects within the contiguous area will yet be derived from the EIA process based on the carrying capacity of the project environment, the nature of the project is called "programmatic."</p>				
<p>GROUP V (Unclassified Projects): These are the projects not listed in any of the groups, e.g., projects using new processes/technologies with uncertain impacts. This is an interim category - unclassified projects will eventually be classified into their appropriate groups after EMB evaluation.</p>				
Main Project Groups	Description	Project Sub-groups		
		New	Existing with ECC but with Proposal for Modification or Resumption of Operation	Operating Without ECC
I	Single ECP in ECA or NECA	I - A	I - B	I - C
II	Single NECP in ECA	II - A	II - B	II - C
III	Single NECP in NECA	III - A	Not applicable	Not applicable
IV	Co-located Projects in either ECA or NECA	IV - A	IV - B	IV - C
V	Unclassified Projects	V - A	Not applicable	Not applicable

Appendix 5. Environmentally Critical Projects (ECP)

A. Environmentally Critical Projects (ECP)	
I.	<p>Heavy Industries</p> <ul style="list-style-type: none"> a. Non-ferrous metal industries b. Iron and steel mills c. Petroleum and petro-chemical industries including oil and gas d. Smelting plants
II.	<p>Resource Extractive Industries</p> <ul style="list-style-type: none"> a. Major mining and quarrying projects b. Forestry projects <ul style="list-style-type: none"> ▪ Logging ▪ Major wood processing projects ▪ Introduction of fauna (exotic-animals) in public/private forests ▪ Forest occupancy ▪ Extraction of mangrove products ▪ Grazing c. Fishery Projects <ul style="list-style-type: none"> ▪ Dikes for fishpond development projects
III.	<p>Infrastructure Projects</p> <ul style="list-style-type: none"> a. Major dams b. Major power plants (fossil-fueled, nuclear fueled, hydroelectric or geothermal) c. Major reclamation projects d. Major roads and bridges
B. Environmentally Critical Areas (ECA)	
	<ol style="list-style-type: none"> 1. All areas declared by law as national parks, watershed reserves, wildlife preserves and sanctuaries; 2. Areas set aside as aesthetic potential tourist spots; 3. Areas which constitute the habitat for any endangered or threatened species of indigenous Philippine Wildlife (flora and fauna); 4. Areas of unique historic, archaeological, or scientific interests; 5. Areas which are traditionally occupied by cultural communities or tribes; 6. Areas frequently visited and/or hard-hit by natural calamities geologic hazards, floods, typhoons, volcanic activity, etc. 7. Areas with critical slopes; 8. Areas classified as prime agricultural lands; 9. Recharged areas of aquifers; 10. Water bodies characterized by one or any combination of the following conditions: <ul style="list-style-type: none"> a. tapped for domestic purposes; b. within the controlled and/or protected areas declared by appropriate authorities; c. which support wildlife and fishery activities. 11. Mangrove areas characterized by one or any combination or the following conditions: <ul style="list-style-type: none"> a. with primary pristine and dense young growth; b. adjoining mouth of major river systems; c. near or adjacent to traditional productive fry or fishing grounds; d. which act as natural buffers against shore erosion, strong winds and storm floods; e. on which people are dependent for their livelihood. 12. Coral reef characterized by one or any combination of the following conditions: <ul style="list-style-type: none"> a. with 50% and above live coralline cover; b. Spawning and nursery grounds for fish; c. Which act as natural breakwater of coastlines.

Appendix 6. Respondent Profiles

Respondent Code	Location	Barangay	Age	Sex	Highest Educational Attainment	Occupation	Years of Residency
R-BAL-01	Sta. Rosa City	Balibago	61	Male	Elementary Graduate	Sari-Sari Store Owner	50
R-BAL-02	Sta. Rosa City	Balibago	36	Male	High School Graduate	Tricycle Driver	36
R-BAL-03	Sta. Rosa City	Balibago	66	Male	College Graduate	Retired	44
R-BAL-04	Sta. Rosa City	Balibago	22	Male	High School Graduate	Warehouse Staff	22
R-BAL-05	Sta. Rosa City	Balibago	59	Male	High School Graduate	Construction Worker	11
R-BAL-06	Sta. Rosa City	Balibago	47	Male	College Graduate	Engineer	23
R-BAL-07	Sta. Rosa City	Balibago	21	Male	College Level	BPO Agent	2
R-BAL-08	Sta. Rosa City	Balibago	30	Male	College Level	Warehouse Staff	21
R-BAL-09	Sta. Rosa City	Balibago	45	Male	College Level	Machine Operator	16
R-BAL-10	Sta. Rosa City	Balibago	37	Male	College Graduate	Store Manager	37
R-BAL-11	Sta. Rosa City	Balibago	45	Male	Vocational Graduate	Maintenance Technician	14
R-BAL-12	Sta. Rosa City	Balibago	44	Male	Elementary Graduate	Utility Worker	6
R-BAL-13	Sta. Rosa City	Balibago	39	Male	High School Graduate	Production Operator	39
R-BAL-14	Sta. Rosa City	Balibago	38	Female	College Level	Administrative Assistant	10
R-BAL-15	Sta. Rosa City	Balibago	43	Male	College Graduate	Machine Operator	27
R-BAL-16	Sta. Rosa City	Balibago	59	Male	High School Graduate	Mechanic	28
R-BAL-17	Sta. Rosa City	Balibago	31	Female	College Graduate	Government Employee	9
R-BAL-18	Sta. Rosa City	Balibago	35	Female	Elementary Graduate	Utility Worker	12
R-BAL-19	Sta. Rosa City	Balibago	41	Female	College Level	Government Employee	7
R-BAL-20	Sta. Rosa City	Balibago	57	Female	High School Graduate	Cook	25
R-BAL-21	Sta. Rosa City	Balibago	46	Female	High School Graduate	Retail Cashier	13
R-BAL-22	Sta. Rosa City	Balibago	36	Female	Vocational Graduate	Technician	18
R-BAL-23	Sta. Rosa City	Balibago	46	Female	College Graduate	Teacher	46
R-BAL-24	Sta. Rosa City	Balibago	52	Male	Elementary Graduate	Laborer	15
R-BAL-25	Sta. Rosa City	Balibago	61	Male	College Graduate	Unemployed	24

Respondent Code	Location	Barangay	Age	Sex	Highest Educational Attainment	Occupation	Years of Residency
R-P00-01	Sta. Rosa City	Pooc	45	Female	Vocational Graduate	Nursing Aide	19
R-P00-02	Sta. Rosa City	Pooc	37	Male	Elementary Graduate	Construction Worker	26
R-P00-03	Sta. Rosa City	Pooc	38	Female	Elementary Graduate	Housewife	14
R-P00-04	Sta. Rosa City	Pooc	31	Female	Elementary Graduate	Sari-sari Store Owner	28
R-P00-05	Sta. Rosa City	Pooc	53	Male	Vocational Graduate	Welder	43
R-P00-06	Sta. Rosa City	Pooc	61	Male	High School Graduate	Self-employed	16
R-P00-07	Sta. Rosa City	Pooc	55	Male	Vocational Graduate	BPO Agent	15
R-P00-08	Sta. Rosa City	Pooc	22	Male	College Level	Office Clerk	22
R-P00-09	Sta. Rosa City	Pooc	36	Male	High School Graduate	Driver	36
R-P00-10	Sta. Rosa City	Pooc	26	Female	Elementary Graduate	Store owner	26
R-P00-11	Sta. Rosa City	Pooc	29	Male	College Graduate	IT Support Staff	29
R-P00-12	Sta. Rosa City	Pooc	37	Female	High School Graduate	Receptionist	37
R-P00-13	Sta. Rosa City	Pooc	40	Female	College Level	Service Crew	19
R-P00-14	Sta. Rosa City	Pooc	49	Male	High School Graduate	Security Guard	12
R-P00-15	Sta. Rosa City	Pooc	42	Male	Vocational Graduate	HVAC Technician	22
R-P00-16	Sta. Rosa City	Pooc	58	Male	Elementary Graduate	Factory Worker	7
R-P00-17	Sta. Rosa City	Pooc	35	Male	Elementary Graduate	Tricycle Driver	15
R-P00-18	Sta. Rosa City	Pooc	53	Male	College Level	BPO Agent	26
R-P00-19	Sta. Rosa City	Pooc	34	Male	Vocational Graduate	Electrician	23
R-P00-20	Sta. Rosa City	Pooc	36	Female	College Graduate	Government Employee	36
R-P00-21	Sta. Rosa City	Pooc	27	Female	College Level	BPO Agent/ Call center	18
R-P00-22	Sta. Rosa City	Pooc	50	Male	Elementary Graduate	Laborer	26
R-P00-23	Sta. Rosa City	Pooc	42	Male	High School Graduate	Office Assistant	11
R-P00-24	Sta. Rosa City	Pooc	55	Female	High School Graduate	Unemployed	18
R-P00-25	Sta. Rosa City	Pooc	28	Female	High School Graduate	BPO Agent	15
R-CAM-01	Baguio City	City Camp	56	Male	Elementary Graduate	Taxi Driver	56
R-CAM-02	Baguio City	City Camp	21	Male	High School Graduate	Mason	10

Respondent Code	Location	Barangay	Age	Sex	Highest Educational Attainment	Occupation	Years of Residency
R-CAM-03	Baguio City	City Camp	52	Female	High School Graduate	Market Vendor	17
R-CAM-04	Baguio City	City Camp	31	Female	Elementary Graduate	Housewife	17
R-CAM-05	Baguio City	City Camp	50	Female	College Graduate	Government Employee	27
R-CAM-06	Baguio City	City Camp	63	Female	High School Graduate	Business Owner	11
R-CAM-07	Baguio City	City Camp	34	Male	Vocational Graduate	Electrical Technician	28
R-CAM-08	Baguio City	City Camp	24	Female	Elementary Graduate	Housewife	6
R-CAM-09	Baguio City	City Camp	51	Male	Elementary Graduate	Taxi Driver	21
R-CAM-10	Baguio City	City Camp	32	Male	Vocational Graduate	Mechanic	7
R-CAM-11	Baguio City	City Camp	46	Male	Vocational Graduate	Technician	12
R-CAM-12	Baguio City	City Camp	59	Male	Vocational Graduate	Auto Mechanic	7
R-CAM-13	Baguio City	City Camp	63	Female	College Graduate	Teacher	11
R-CAM-14	Baguio City	City Camp	36	Female	College Graduate	Office Clerk	9
R-CAM-15	Baguio City	City Camp	50	Female	Elementary Graduate	Store Owner	5
R-CAM-16	Baguio City	City Camp	60	Male	Elementary Graduate	Taxi Driver	22
R-CAM-17	Baguio City	City Camp	53	Female	High School Graduate	Housewife	16
R-CAM-18	Baguio City	City Camp	36	Female	College Level	Service Crew	10
R-CAM-19	Baguio City	City Camp	55	Female	Vocational Graduate	Store Owner	30
R-CAM-20	Baguio City	City Camp	21	Female	Elementary Graduate	Market Vendor	9
R-CAM-21	Baguio City	City Camp	28	Male	Vocational Graduate	Technician	9
R-CAM-22	Baguio City	City Camp	39	Male	College Level	Taxi Driver	11
R-CAM-23	Baguio City	City Camp	53	Female	College Level	Market Vendor	6
R-CAM-24	Baguio City	City Camp	61	Female	College Level	Sari-Sari Store Owner	6
R-CAM-25	Baguio City	City Camp	42	Male	College Level	Mechanic	10
R-CRE-01	Baguio City	Cresencia Village	56	Female	Vocational Graduate	Market Vendor	5
R-CRE-02	Baguio City	Cresencia Village	25	Male	College Graduate	Office Clerk	6
R-CRE-03	Baguio City	Cresencia Village	58	Male	College Graduate	Government Employee	9
R-CRE-04	Baguio City	Cresencia Village	40	Female	Elementary Graduate	Barangay Health Worker	16
R-CRE-05	Baguio City	Cresencia Village	64	Male	Elementary Graduate	Farmer	16

Respondent Code	Location	Barangay	Age	Sex	Highest Educational Attainment	Occupation	Years of Residency
R-CRE-06	Baguio City	Cresencia Village	54	Male	High School Graduate	Taxi Driver	10
R-CRE-07	Baguio City	Cresencia Village	49	Male	High School Graduate	Taxi Driver	28
R-CRE-08	Baguio City	Cresencia Village	47	Male	College Level	Technician	10
R-CRE-09	Baguio City	Cresencia Village	45	Male	College Graduate	Office Clerk/HR	12
R-CRE-10	Baguio City	Cresencia Village	50	Female	College Level	Barangay Health Worker	30
R-CRE-11	Baguio City	Cresencia Village	35	Male	High School Graduate	Farmer	17
R-CRE-12	Baguio City	Cresencia Village	38	Male	College Level	Utility Worker	16
R-CRE-13	Baguio City	Cresencia Village	46	Female	Elementary Graduate	Housewife	8
R-CRE-14	Baguio City	Cresencia Village	32	Female	Elementary Graduate	Market Vendor	8
R-CRE-15	Baguio City	Cresencia Village	48	Female	College Level	Unemployed	18
R-CRE-16	Baguio City	Cresencia Village	53	Male	College Graduate	Barangay Councilor	23
R-CRE-17	Baguio City	Cresencia Village	37	Male	College Graduate	Government Employee	5
R-CRE-18	Baguio City	Cresencia Village	55	Male	College Level	Administrative Assistant	25
R-CRE-19	Baguio City	Cresencia Village	63	Female	Vocational Graduate	Unemployed	63
R-CRE-20	Baguio City	Cresencia Village	40	Female	College Graduate	Teacher	15
R-CRE-21	Baguio City	Cresencia Village	65	Female	Vocational Graduate	Unemployed/retired	65
R-CRE-22	Baguio City	Cresencia Village	47	Male	High School Graduate	Taxi Driver	24
R-CRE-23	Baguio City	Cresencia Village	40	Female	Vocational Graduate	Daycare worker	40
R-CRE-24	Baguio City	Cresencia Village	39	Male	College Graduate	BPO Agent/Call center	39
R-CRE-25	Baguio City	Cresencia Village	59	Female	Postgraduate	University faculty member	29