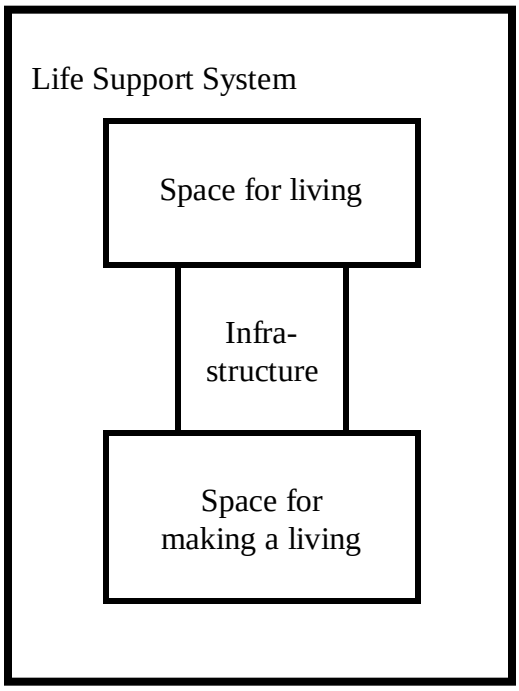
CAGAYAN VALLEY

REGIONAL PHYSICAL FRAMEWORK PLAN

(2001-2030)

On the cover of the RPFP 2001-2030



The cover presents the four land uses as explained by Ernesto M. Serote in his book, Property, Patrimony and Territory. (2004)

"Accordingly, any territorial unit, regardless of level or scale, can be seen as consisting of four areas used under any of the following purposes: 1) as a space for living, 2) as a space for making a living, 3) as a space for the facilities that support the other two spaces, and 4) as an open space that serves as the life support system for the human population. The space for living is that area utilized by man in performing the activities needed for the reproduction and well-being of his species. The space for making a living is used for carrying out his livelihood. The space for facilities provides conditions conducive to the effective use of the two other spaces. The life support system is the source of fresh food, fresh air, fresh water and is the receiver of the wastes generated in the course of utilizing the three other spaces. These four spaces were later translated into settlement, production, infrastructure, and protection areas, respectively."

Republic of the Philippines
REGIONAL DEVELOPMENT COUNCIL 02
NEDA Bldg., Regional Government Center, Carig, Tuguegarao City
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RDC2 Resolution No. 02-002
Series of 2005

APPROVING AND ADOPTING THE CAGAYAN VALLEY REGIONAL PHYSICAL FRAMEWORK PLAN (RPFP) 2001-2030

WHEREAS, Section 2 of Letter of Instruction No. 1350, dated August 2, 1983 provides for the formulation of an indicative Regional Physical Framework Plan (RPFP) which would spell out the policy agenda for the utilization and development of the region's land and other physical resources to obtain their maximum possible social and economic benefits for the people in a sustainable manner;

WHEREAS, upon completion of the current RPFP (1994-2022) in April 1993, significant environmental laws and policies were enacted such as RA 8436 or the AFMA Law, the IPRA Law, RA 8749 or the Clean Air ACT, RA 9003 or the Ecological Solid Waste Management Act" and other important land use policies;

WHEREAS, the present administration recognized the need to integrate these in the RPFPs of all regions, thus prioritized the updating of the Regional Physical Framework Plans nationwide;

WHEREAS, the Regional Land Use Committee (RLUC 2), which is mandated to coordinate land use planning activities in the region, updated the Regional Physical Framework Plan to cover the period 2001-2030;

WHEREAS, the Updated RPFP embodies the region's agenda on land using activities, environmental management, settlements pattern and the development of other physical resources of the Cagayan Valley Region;

WHEREAS, the document was subjected to a series of consultations that included RDC Committee reviews, provincial consultations, interregional consultation with Regions 1, 3 and CAR, and a review of the updated document by the National Land Use Committee (NLUC) secretariat;

WHEREAS, the members of the RDC 2, after the evaluation of the document, finds the Plan consistent with the national policy direction and the regional development thrusts of the Cagayan Valley and properly provides the framework for provincial and city land use plans and decisions;

NOW THEREFORE, RESOLVED, AS IT IS HEREBY RESOLVED, to approve the Updated Regional Physical Framework Plan (RPFP) for 2001-2030;

RESOLVED FURTHER, that this document be forwarded to the Office of the President through the National Land Use Committee (NLUC) Secretariat for the issuance of a Proclamation legitimizing the Updated Regional Physical Framework Plan;

ADOPTED UNANIMOUSLY, this 17th day of February 2005 at Balay na Santiago, Santiago City.

Certified correct:

MARYANNE E.R. DARAUAY
RDC2 Secretary

Approved:

Gov. VICENTE S. GATO
RDC2 Chairman

Bishop RAMON B. VILLENA
RDC2 Co-Chairman

MESSAGE

The Regional Physical Framework Plan (2001 – 2030) is considered the "mother of all Plans" as it provides the policies in the utilization of the region's land resources for the next thirty years across settlements, production and protection land use, and infrastructure development. All other regional plans should therefore conform with the RPFP. Likewise, agency, LGU and private sector programs and projects are expected to support and implement this Plan.

This document will guide the preparation of the Provincial Physical Framework Plan, the City and the Municipal Comprehensive Land Use Plans. With decentralization, the local executives are empowered to provide the detailed actions and programs that will implement the RPFP. It is in this line, that I strongly urge local executives to assess their respective localities and provide solutions in managing their own resources as we all join hands in seeking solutions to our resource problems and in contributing to the judicious allocation and use of our resources.

With the support of everyone from the national and local governments, the civil society and business groups, the goals of our RPFP can be reached.

VICENTE S. GATO
RDC 2 Chair and
Governor of Batanes

MESSAGE

Greetings of Peace!

The Constitution of our Republic recognizes the role of the civil societies in all government undertakings concerning the development of our people. Local Government Code of 1991 provides local constituents a venue to define and manage the directions of the development of communities through representation in the Development Councils whether in the Barangay.

We, the representatives of the Civil Society and Business Sectors of the Regional Development Council of this region are happy to be part of the formulation of the Regional Physical Framework Plan, 2001-2030 (RPFP). This participation is a manifestation of the wholesome partnership between the government and civil societies in the process of planning for the development of our region.

For the RPFP to be effective and useful, it must be translated in the context of each province in the region. The challenge now lies in the hands of the local executives who are tasked to translate and detail the RPFP taking proper consideration of their respective assets/resources and the aspirations of their populace. We, the makers of this RPFP encourage proper community consultations and well discerned planning in all localities, so that at the end, we can proudly say: "We did it!"

We look forward to seeing the Provincial, City and Municipal Physical Land Use Plans prepared and implemented for the bright future of our region. Good Luck!

+ Ramón B. Villena

Most Rev. RAMON B. VILLENA, DD
Bishop, Diocese of Bayombong, and
RDC 2 Co-Chair

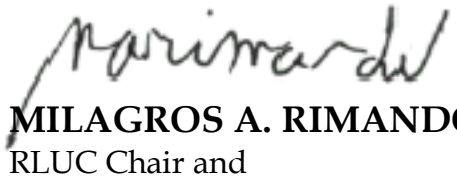
Foreword

This Regional Physical Framework Plan (2001 – 2030) is a regional document that seeks to provide a set of policies in achieving decisions on how land and other natural resources may be developed, managed and conserved for the benefit of the present and future generations of the region's population.

The preparation of this document by the Technical Working Group of the Regional Land Use Committee (RLUC) started in January 2003 with the assessment of the first ten years of implementation of the previous RPFP (1991-2025). The two-year planning process covered four levels of study and consultations: first, with the Technical Working Group, then in the RDC Committees, the Provincial Consultations through the Provincial Development Councils, and the conduct of interregional consultations. In all these levels, steps were taken to ensure that the plan reflects consensus through the participation of the core government agencies, local government units, private sector representatives and members and/or representatives of the Congressmen in the region.

The RPFP is an excellent reference for sectoral and agency planning purposes and for determining the most appropriate policy options and corresponding strategies for local plans. It is indeed timely and fortunate that its completion and subsequent approval by the RDC comes at a time when the provinces are preparing to update their Provincial Physical Framework Plans (PPFPs), and the cities and municipalities are also updating their CLUPs. It is stressed that this is just a framework plan and the true implementation is in the hands of the local executives and planners.

I wish to thank all those who have contributed to the formulation of this document. Given the enthusiasm and commitment of all sectors in the region, I am confident that this RPFP will help influence the development of our region as we envision.



MILAGROS A. RIMANDO
RLUC Chair and
NEDA Regional Director

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LIST OF ACRONYMS

AAGR	– Annual Average Growth Rate
AFF	– Agriculture, Fisheries and Forestry
AFMA	– Agriculture and Fisheries Modernization Act
A&D	– Alienable and Disposable
BOT	– Build and Operate Transfer
BSWM	– Bureau of Soils and Water Management
CADC	– Certificate of Ancestral Domain Claim
CAR	– Cordillera Autonomous Region
CARP	– Comprehensive Agrarian Reform Program
CBD	– Central Business District
CBFM	– Community Based Forest Management
CLUP	– Comprehensive Land Use Plan
CRBWRDP	– Cagayan River Basin Water Resources Development Program
CSEZFP	– Cagayan Special Economic Zone Free Port
DA	– Department of Agriculture
DLR	– Department of Land Reform
DENR	– Department of Environment and Natural Resources
EEZ	– Exclusive Economic Zone
EMT	– Environmental Management Tool
ERA	– Environmental Risk Assessment
GIS	– Geographic Information System
GRDP	– Gross Regional Domestic Product
GVA	– Gross Value Added
IEC	– Information Education Campaign
IFMA	– Integrated Forest Management Agreement
IP/ICC	– Indigenous Peoples/Cultural Communities
IPRA	– Indigenous Peoples Rights Act
LGU	– Local Government Unit
MSME	– Micro, Small and Medium Enterprises
MTPDP	– Medium Term Philippine Development Plan
MTPIP	– Medium Term Philippine Investment Plan
NFPP	– National Framework for Physical Planning
NGO	– Non-Government Organization
NIPAS	– National Integrated Protected Areas System
NLGA	– North Luzon Growth Area
NLQGA	– North Luzon Quadrangle Growth Area
NPAAAD	– Network of Protected Areas for Agriculture and Agro-Industrial Development
NRMIS	– Natural Resources Management Information System
NSMNP	– Northern Sierra Madre Natural Park
PBCPP	– Philippine Biodiversity Conservation Priority-Setting Program

PLA	– Pasture Lease Agreement
PNOC	– Philippine National Oil Company
PO	– Peoples Organization
PPFP	– Provincial Physical Framework Plan
RAIC	– Regional Agri-Industrial Center
RDC	– Regional Development Council
RDP	– Regional Development Plan
RDIP	– Regional Development Investment Plan
RGIN	– Regional Geographic Information Network
RLAs	– Regional Line Agencies
RLUC	– Regional Land Use Committee
RPFP	– Regional Physical Framework Plan
R&D	– Research and Development
SAFDZ	– Strategic Agriculture and Fisheries Development Zone
TWG	– Technical Working Group

EXECUTIVE SUMMARY

The Regional Physical Framework Plan of Region II is designed to show the desired direction and intensity of growth of the region as a whole, as well as of its sub-regional areas, covering a period of 30 years, from 2001 to 2030. It is a document embodying a set of policies that seeks to guide public and private investments in order to effect an efficient settlement pattern for better access by the region's population to basic services and economic opportunities, and a rational mix of land uses that promotes productivity and safeguards environmental integrity.

The first part of the document includes the assessment of the current RPFP highlighting sectoral performance for the first 10-year phase of the document. Chapter II presents the characterization of the region and its sub-regional areas and sectors. This part highlights the region's opportunities which includes; underdeveloped resources; wide expanse of rich agricultural areas; productive forestlands and vast grasslands; abundant inland water and marine resources; and undeveloped mineral and indigenous energy resources. Along with these opportunities are the region's development challenges that includes: incompatible land uses; encroachment on protected areas; inadequate infrastructure support facilities and utilities and unmanaged exploitation of resources that all resulted to environmental degradation and low productivity.

The RPFP Vision and Strategy

From the situational accounts of the region's physical resources as presented in the earlier chapter. Chapter III outlines the Regional Physical Framework for the 30-year plan period. It defines a spatial development vision, spatial strategy and the set of policies and strategies of the different plan components i.e., Settlements Component, Production Land Use, Protection Land Use and Infrastructure Component. The region's vision aims for a physically developed area with rational network of agri-related industries, accessible services and economic opportunities, strategically located infrastructure, and a region with stable watershed areas. This vision shall be achieved through the operationalization of the spatial development strategy – "Parallel Growth Spatial Strategy". This strategy aims to harmonize the relationship between the region's desire to facilitate and attain agro-industrial development and the need to enhanced the region's environmental integrity. Hence while revolutionizing agri-industrial development in the region equal attention will be accorded in the protection and sustainability of land utilization.

The operationalization of the spatial strategy includes the delineation of the region into three (3) major/broad land use categories i.e., protection within the forest corridor, production at the valley side and multiple use within the Cagayan Riverine Zone as well as other land areas with more than one distinct use. These broad land use are further subdivided into sub development zones which are delineated based on homogeneity in terms of natural resource endowments. Protection areas are classified as conservation zones while production areas are zoned as the Free Trade Zone, Economic Zones, Light Industrial Estate, Regional Industrial/Financial/Commercial/Institutional Zones, Agriculture Zones, Fishery Zones, Agro-Forestry Zones, Potential Mining Zones, Tourism Zones (Island, Coastal, Upland, Lowland).

In the same chapter (Chapter III), the roles of the provinces, cities and fast urbanizing municipalities/centers were also recognized based on their comparative advantages. It is also in this chapter where the policies and strategies of the different plan components (Proposed Production Land Use, Protection Land Use, Settlements Component and Infrastructure Component) are detailed.

Production Land Use

The production land use component aims to optimize the sustainable use and management of resources towards a greater agri-industrial productivity. Its policies focus on the sustainable utilization of the region's resources, tapping the undevelop land and water resources and strengthen R&D and extension services management for countryside to prioritize eco-tourism sites for development.

Protection Land Use

The protection land use component aims to protect and maintain environmental integrity thru conservation, preservation and rehabilitation of natural resources. To effectively manage and control the degradation of the environment and ensure a balance between economic development and environmental integrity, human intrusion and exploitation activities in protected areas shall be drastically reduced. Priority policies and activities shall be focused on the ground delineation of protected areas specifically watershed areas and key bio-diversity areas and the preparation and implementation of corresponding management plans in these areas.

Settlements Component

The Settlements Plan Component aims to rationalize the distribution of population to increase access to adequate quality social services, economic opportunities and benefits. It calls for the provision of both the distinct requirements of urban and rural areas in terms of access and services. It also aims for the enhancement of internal as well as external linkages to further improve local production as well as enhance domestic, interregional, national and foreign market access. Local Government Units are encouraged to strictly enforce national policies and effectively regulate and implement zoning ordinances and other land use policies. The settlements component will further promote metropolitan arrangement to boost internal complementation of sub-regional areas and urban-rural linkages in the region.

The Infrastructure Plan Component primarily aims to provide adequate, safe and reliable infrastructure facilities and utilities to support the requirements of the regional economy while maintaining ecological balance. It shall provide the necessary support to the Settlements and Land Use Plan Components (Production and Protection). Infrastructure Component is expected to stimulate growth as well as help to strategize the preservation of protected areas. It shall provide an efficient telecommunication system and a reliable power supply catering to rural communities and the development of potential indigenous energy sources in the region. It shall also develop its water resources to focus on irrigation coverage expansion.

Phasing of Plan Implementation

The implementation of the RPFP is further detailed into three (3) 10-year periods or phasing of the plan that characterized the integration of the different plan component's (Production Land Use, Protection Land Use, Settlements Component and Infrastructure Component) priority activities. In the first phase (2001-2010), the region will optimize the use of its croplands, marine areas, production forest areas and mineral lands en route towards augmentation of its resource base in agriculture, fishery, forestry, minerals and indigenous energy. Within this phase, intensified efforts on full restriction and strict regulation on protected areas shall be pursued, and rehabilitation activities on degraded areas shall be asserted

The Second phase (2011-2020), will continue to strengthen the complementation of the different components through establishment of medium to large-scale agri-based industries of urban and rural communities. The agglomeration of LGUs shall have been completed towards the end of this phase, thus, optimizing productivity will remain as the major framework for all production areas. Rehabilitation of watersheds and other degraded areas within the protected forest shall remain the focus on this phase.

Towards the end of the Third Phase (2021-2030), the region's population shall have equitable access to social services and economic opportunities. Within this phase, Interregional complementation of higher-level services (e.g., education and health) and industries (agri-based) shall have been established. The whole system of production, processing and settlements distribution in the region shall have been fully integrated. And the smooth flow of services and commodities within urban and rural areas shall have been achieved.

The RPFP and other Plans

To ensure integration of the RPFP with other plans, the document will go through an iterative process in its preparation. It is anticipated that policies of the four major plan components are within the broad policies of the National Framework for Physical Planning (NFPP). Likewise the RPFP being essentially a general framework, it is expected that this will be replicated in greater detail at the local level plans that serves as basis for LGUs in preparation of their Provincial Physical Framework Plans (PPFPs), City Comprehensive Land use Plans (CCLUPs) and Municipal Comprehensive Land Use Plans (MCLUPs). Capability building and research activities shall be undertaken to improve land use planning capabilities of planners. Accordingly monitoring and evaluation system supported by GIS-based databank shall be in place. And for a better appreciation of the stakeholders, advocacy shall be pursued to increase awareness of the populace on the document's mandate.

With the RPFP, therefore, it is hoped that the programs, projects and activities to be undertaken by the public and private sectors in the region shall become more focused and more effective, efficient and meaningful, towards the hastened attainment of the regions primordial goal of improving the quality of life of its people.

CHAPTER 1
INTRODUCTION

The Regional Physical Framework Plan of Region 02 is designed to guide the direction and intensity of growth of the region as a whole, as well as of its sub-regional areas, covering a period of 30 years, from 2001 to 2030. This growth that the RPFP seeks to promote represents a balance between the need for the region to fulfill its functional role with respect to the national economy and the physical resources of the region. Accordingly, it takes into account and seeks to contribute to the attainment of national and regional development goals and targets. At the same time, the RPFP seeks to guide public and private investments in order to effect an efficient settlement pattern for better access by the region's population to basic services and economic opportunities, and a rational mix of land uses that promotes productivity and safeguards environmental integrity.

The importance of the RPFP lies not only in its own specified purpose and the role it plays in the effective utilization, development and management of the region's land and other natural resources. While it links with the National Framework for Physical Planning (NFPP 2001-2030) it also affects and links with the Medium-Term Regional Development Plan (RDP) and the Regional Development Investment Program (RDIP). Likewise, it guides the formulation of Provincial Development Plans and Municipal Comprehensive Development Plans or Town Plans and the sectoral plans of various line agencies of the national government at the regional and local levels.

A. GENERAL ASSUMPTIONS AND PRINCIPLES

The RPFP policies contained herein are based on an in-depth assessment and analysis of the existing socio-economic and physical conditions and characteristics of the region, using techniques acquired through the capability-building program provided by the National Land Use Committee, together with a general feel of the region gathered through extensive consultations with its policymakers and the public in general.

Based on the assessment of existing conditions, policy recommendations were formulated/drawn up, which is hoped to be utilized by the regional and local government units and national line agencies as a guide to determine the necessary programs, projects and activities to be undertaken to attain the Plan's goals and objectives.

The Plan proceeds on the premise that the assumptions, which are based on the best estimation of the events expected to happen in the future, will materialize accordingly. The Plan, therefore, makes exceptions to matters normally considered as outside the control of the planners and implementors, such as cataclysmic natural events or force majeure.

B. GENERAL OBJECTIVES

The Regional Physical Framework Plan (RPFP) is a document on the policies and a graphic translation of the desired spatial arrangement of land-using activities in the region in order to: (a) effect a rational distribution of the regional population; (b) facilitate access by the regional population to basic services; (c) guide public and private investments to ensure optimum and sustained use of natural and man-made resources; and (d) safeguard and protect the integrity of the physical environment.

The regional document is expected to serve as a guide to decisions on how the land and other natural resources of the region may be put into the most beneficial use for the people, and at the same time to indicate how such resources may be managed and conserved for the future. With the RPFP, therefore, it is hoped that the programs, projects and activities to be undertaken by the public and private sectors in the region shall become more focused and more effective, efficient and meaningful, towards the hastened attainment of the region's primordial goal of improving the quality of life of its people.

C. ORGANIZATION AND PARTS

The RPFP is divided into major sections and sub-sections which basically follow the steps in the development planning process, i.e. from the analysis of the existing conditions, to goal and objectives formulation, to strategy generation to the identification of specific programs and projects, and to plan implementation.

Chapter 1, Introduction, presents the general assumptions and principles underlying the plan and the region's general objectives and the organizational parts of the document. It will also highlight a general assessment of the region's past performance particularly in terms of meeting the goals and objectives and in implementing the spatial development strategy. Chapter 2 of the document provides the bases of the plan or the planning environment. In this section, an assessment of the existing and anticipated socio-economic and physical conditions of the region, subdivided according to the major sectors of the regional economy will be explained.

Based on the assessment and analysis presented in Chapter 2, the next section of the document (Chapter 3) presents the Regional Physical Framework of the region. The highlights of this chapter will be the development vision, sectoral goals and objectives and the preferred spatial development strategy. Chapter 3 also presents the four major plan components or sector plan of the document namely the Settlements Plan; Production and Protection Land Use Plan; and the Infrastructure Plan Component. The major features will be the policies of the different sectors accompanied with appropriate maps to clearly illustrate the plan's physical and locational dimension.

The last part of the document (Chapter 4) will be the Plan Implementation Chapter. It describes the institutional, political and administrative arrangements for implementing the RPFP. The Chapter also covers monitoring and evaluation and presents other support activities necessary for plan implementation.

D. ASSESSMENT OF RPFP PERFORMANCE

This portion of the Updated Regional Physical Framework Plan (RPFP 2001-2030) attempts to assess the implementation of the RPFP 1991-2020, particularly with respect to its first ten-year phase of implementation or for the period covering 1991-2000. An overview of the sectoral policies aimed at operationalizing the overall spatial development strategy covering the first ten-year phase of the Plan and the corresponding assessment of their implementation is presented in the succeeding discussions.

The Regional Physical Framework Plan (RPFP), 1991 – 2020 was formulated to provide the direction and intensity of growth of the region covering a period of 30 years. As its overall spatial development strategy, the RPFP 1991-2020 adopted the "Midrib – Peripheral Growth Center Socio – Economic Zone Development Strategy". This strategy, which was translated into sector-specific policy proposals, was seen to make the region achieve a faster physical and socio-economic development through the optimum utilization of human and natural resources. The RPFP was phased into three ten-year periods for more precise presentation of the region's desired spatial development directions.

1. Settlements Development

Policy Highlights

The Settlements Component of the RPFP prescribed the desired spatial pattern of development in the region. Its basic feature was the identification of a hierarchy of settlements consisting of prime urban centers, secondary and rural growth centers and rural settlements/production areas. For the first phase of the RPFP implementation, the identified focus of development efforts was the development of existing and potential growth centers, for them to become effective catalysts of regional growth. Related policy proposals included the conversion of prime urban centers, particularly Tuguegarao in Cagayan, Bayombong and Solano in Nueva Vizcaya and Santiago in Isabela into component cities within two (2) decades, provisions for urban planning and institutionalization of land use planning in all LGUs.

Implementation Assessment

Within the period under review, the region was able to convert three (3) of its primary urban centers into cities, namely: Santiago City in 1997 as independent component city, Tuguegarao City in 2000 and Cauayan City in 2001 as component cities. Compared to their level of development in 1990, these centers have significantly improved their facilities and services with the introduction of better communication facilities, enhanced road network, upgrading of institutional services, among others. However, the concentration of settlements in these cities resulted in a rapid pace of urbanization and the emergence of urbanization issues such as traffic congestion, housing backlogs, pollution and inadequate waste management. This underscores the need for urban planning in order to properly manage the growth of these urban centers and the municipalities peripheral to them.

The Plan's objective for the institutionalization of land use planning within the period was only partially achieved. Of the region's five provinces, only Cagayan and Isabela were able to complete the legitimization of their PPFPs as of end of 2002. The other provinces

still need to update and ratify their PPFPs. In terms of CLUP formulation, the two cities (Santiago City and Tuguegarao City) have updated plans but only 27 out of the 93 municipalities/cities have updated and ratified land use plans within the review period. The remaining municipalities are still in the process of plan formulation and approval stage.

2. Protection Land Use

Policy Highlights

The RPFP policy thrusts concerning the management and protection of forestlands emphasized on: a) prioritizing the rehabilitation and protection activities of the region in favor of the designated forest protection areas; and b) discouraging economic or other forms of activities within forest protection areas except for other uses such as research and institutional purposes subject to their being non-detrimental to the environment.

Implementation Assessment

In order to prioritize the rehabilitation of degraded forest protection areas, the Department of Environment and Natural Resources (DENR) allocated a significant portion of its budget for the rehabilitation of degraded watersheds particularly in the provinces of Quirino and N. Vizcaya where critical watersheds and headwaters of major rivers are located. For its effort, the DENR was able to rehabilitate/reforest a total of 473.07 hectares within watershed areas from 1991 to 2000.

The concept of "watershed as a planning unit" was likewise adopted by the DENR in its forest land use planning in the region. This approach involved the integration of the inter-relationships between the uplands, lowlands and the coastal zones in the formulation of policy/program/project interventions for forest resource management.

3. Production Land Use

3.1 Production Forest

Policy Highlights

The policy thrusts for the production forest sector included the utilization of second growth production forest for industrial tree plantation and agro-forestry, the promotion of community logging, and the provision of support to DENR in monitoring the region's timberlands.

Implementation Assessment

The utilization of second growth forest for industrial tree plantation was undertaken through several community-based projects such as the Community-Based Forest Management Projects (CBFM), Integrated Forest Management Agreement (IFMA) among others. The "community-based management" strategy involved the direct involvement of communities in the management and utilization of forest resources. Community-Based Forest Management Projects (CBFMs) accounted for 43.48 percent or about 313,116.81 hectares of the region's production forest area, while about 24,164 hectares of tree plantation areas were under Integrated Forestry Management

Agreements (IFMAs). In terms of forest monitoring, an interagency/multi-sectoral group was organized in the region in response to the need to provide support to DENR's monitoring activities.

3.2 Agricultural Lands

Policy Highlights

The sub-sector's priority thrust was anchored on the national policy of attaining national food security, particularly for staple crops. In view, however, of the region's over concentration on grains production and in order to optimize productivity in all croplands, the RPFP advocated for the reduction in rice production areas through diversification to high value crops, in order to optimize the productive capacity of all croplands. At the same time, it also called for the protection of prime rice production areas from conversion into other land uses in order to preserve the region's primacy in rice production. The sub-sector also outlined the provision of technical, infrastructure and market support as critical inputs for the optimum utilization of all croplands.

Assessment of Implementation

For the past 10 years, the region maintained its position as the primary producer of rice and corn in the country. Its cropland utilization rate remained concentrated on grains production, although this slightly reduced to 572,289 hectares or 87.43 percent of the total croplands in 2000 from 709,16 hectares or 92 percent of total croplands in 1990. Specifically, its rice production area decreased by about 22 percent in a period of ten years or from 480,551 hectares in 1990 to 374,218 hectares in 2000. Crop diversification was supported with advocacy programs on high value crops such as banana, mango and citrus and the provision of market and technology support. Reports show that between1989 to 2001, there were 37 out 93 municipalities/cities that encountered legal land conversions. This affected 404 hectares or 0.43 percent of the region's agricultural lands. In addition the illegal conversion of prime agricultural land is observed as prevalent.

3.3 Pasturelands

Policy Highlights

In 1992, about 400,000 hectares or 82 percent of the region's pastureland/grassland was classified as unmanaged pasture, making said resource unproductive and underutilized. Given this situation, the sub-sector proposed for the conversion of unmanaged pasture into production forest or agro-forest, depending on their appropriateness for such use. As a safety measure, the environmental impact of development activities to be introduced in the converted pasturelands shall be looked into. Pasturelands within physically constrained areas were proposed to be converted into protection forest. Close monitoring of pasture areas was highlighted as a critical support activity for the sector.

Assessment of Implementation

The ongoing activities of the DENR regarding the management of the region's pasturelands is in consonance with the policies outlined in the RPFP 1991 – 2020. Pasture

Lease Agreements (PLAs) issued to the public have been regularly assessed in terms of the benefits derived and impact to the environment. To date, a total of 64 PLAs covering about 28,217.5 hectares located in the four mainland provinces have not been renewed. Around twenty six percent (26.3%) or 7,421 hectares of these non-renewed PLAs were converted into forest plantations through the SIFMA and other community-based forest projects.

3.4 Fishery Areas

Policy Highlights

The policy thrust for the fishery sector was the development of inland and marine resources, coupled with the enforcement of control measures to safeguard against indiscriminate utilization of fishery resources. Identified support activities include technology research and promotion and the provision of financial and facilities support.

Assessment of Implementation

A number of fishery development programs were implemented in support to the development of the sector. In 1998, RA 8850 otherwise known as the "Philippines Fisheries Code" was enacted to further enhance and strengthen the development, management and conservation of the fisheries and aquatic resources. Several issues, however, impede the optimum development of the fishery industry. Local Governments were observed to lack the sincerity to enforce control measures to safeguard fishery and aquatic resources against indiscriminate utilization. Other issues that still needed to be addressed include: lack of manpower and support facilities; poor access to credit; inadequate infrastructure support and high technology cost for modern fishing technology. In view of these issues, total fish production for the past 10 years has not significantly improved. As of 2000, the region's fish sufficiency level was placed at 35 percent from a level of 23 percent in 1990.

3.5 Mineral Lands

Policy Highlights

Given the limited information on the region's mineral resources, an enhanced effort to improve the information base and information dissemination system was proposed. For feasible mining exploration and development activities, the sub-sector's policy statement called for "ensuring maximum community participation and the institution of measures to minimize the adverse effects of any mining activity". It also cited the enforcement of compensation packages for damages caused by mining activities to the population and environment.

Assessment of Implementation

The passage of RA 7942 or the Philippine Mining Act of 1995 laid down the over-all framework of sustainable mineral resources management. Its intent is to pursue mineral resources development as one option for economic growth, but without compromising the environment. It included strategies on environmental protection and provided safeguards to protect the rights of indigenous peoples. At the regional level, information

dissemination took the forefront especially during the reorganization of the Mines and Geo-Sciences as a separate Line Bureau of the DENR IN 1997-1998. Database on mineral development also improved as the number of applicants on mineral exploration/extraction shoot-up. On the other hand, the Local Government Units (LGUs) continue to manage the development of other mineral resources (e.g., sand and gravel, small scale mining) as mandated by the Local Government Code of 1991.

4. Infrastructure Development

Policy Highlights

Several polices were formulated with the objective of developing a regional infrastructure system that is well harmonized, complementary and adequate to support the other sectors of the economy.

The infrastructure sector policy thrusts focused on a) enhancing the region's inter-regional and regional transportation system; b) expanding the regional telecommunication coverage; c) providing cheap and reliable power; and d) increasing the coverage and efficiency of the region's irrigation system.

Implementation Assessment

Road network development projects completed during the past 10 years period include the completion of several inter-regional roads connecting Region 2 to Regions 1, 3 and CAR. Aside from these, the existing road sections of the Maharlika Highway were improved and rehabilitated. To expand the telecommunication coverage, three (3) exchange carriers operated with a total of 35,699 lines installed while 42 municipalities not served by the exchange carriers were provided with Public Calling Stations. On power generation, indigenous power source development projects included the PNOC Coal Plant in Tumauni, Isabela and the proposed Cauayan Coal Plant.

As of CY-2001, the energization rate at the municipal level has reached 100 percent from 96 percent of total municipalities in 1993. This translates to about 364,977 HHs energized or 69.79 percent household energization rate compared to 292,000 households or 51.3 percent rate in 1993. Irrigation development efforts in year 2000 resulted to about 80,856 hectares of newly nationally irrigated areas or from 138,137 hectares in 1990. However, the rate of irrigation development for the last five years was a mere 0.85 percent per annum, significantly less than the targeted annual average rate of 1.21 percent or 5,739 hectares of new service areas to be generated annually, primarily due to funding constraints.

CHAPTER 2
BASES OF THE PLAN

This section presents a detailed discussion and assessment of the existing and projected socio-economic and physical conditions of the region from which are based the plans and recommendations contained in the Regional Physical Framework.

A. THE REGIONAL PHYSICAL CHARACTERISTICS

a.1 Location

Cagayan Valley lies within the northeastern tip of the Philippines. It is bounded on three sides by big mountain ranges: Cordillera to the west, Caraballo to the south, and Sierra Madre to the east. To the north lies the Babuyan channel beyond which is the North China Sea. Tuguegarao City, the regional capital, is about 485 kilometers from Manila via the Maharlika Highway. (***Figure 1***)

a.2 Political Subdivision

The region is composed of five (5) provinces, namely the island group of Batanes, the valley provinces of Cagayan and Isabela, and the generally mountainous provinces of Nueva Vizcaya and Quirino. There are a total of 90 municipalities and 2 component cities, 1 independent component city and 2,311 barangays ***(Figure 2).***

a.3 Land Area

Cagayan Valley is the fourth largest region in the country with a total land area of 2,683,758 hectares. The provinces of Cagayan and Isabela occupy about three-fourths of the region's area having 900,267 has. and 1,066,456 has., respectively. The remaining area is shared by the provinces of Nueva Vizcaya (390,387 has.), Quirino (305,720 has.), and the island group of Batanes (20,928 has.). (***Table 1***)

a.4 Topography

Topography is generally sloping. About 40 percent of the land is mountainous or with slopes greater than 30 degrees. This is followed by undulating to hilly terrain (8 to 30 degrees slope) and lowlands (below 8 degrees slope) at 31 and 29 percent of total area respectively ***(Table 1 and Figures 3,4 and 5).*** Lands with elevation from 0 to 500 m. above sea level (ASL) represent about 92 percent of the total area while only 8 percent have an elevation between 500 to 1000 m. ASL ***(Figure 3).***

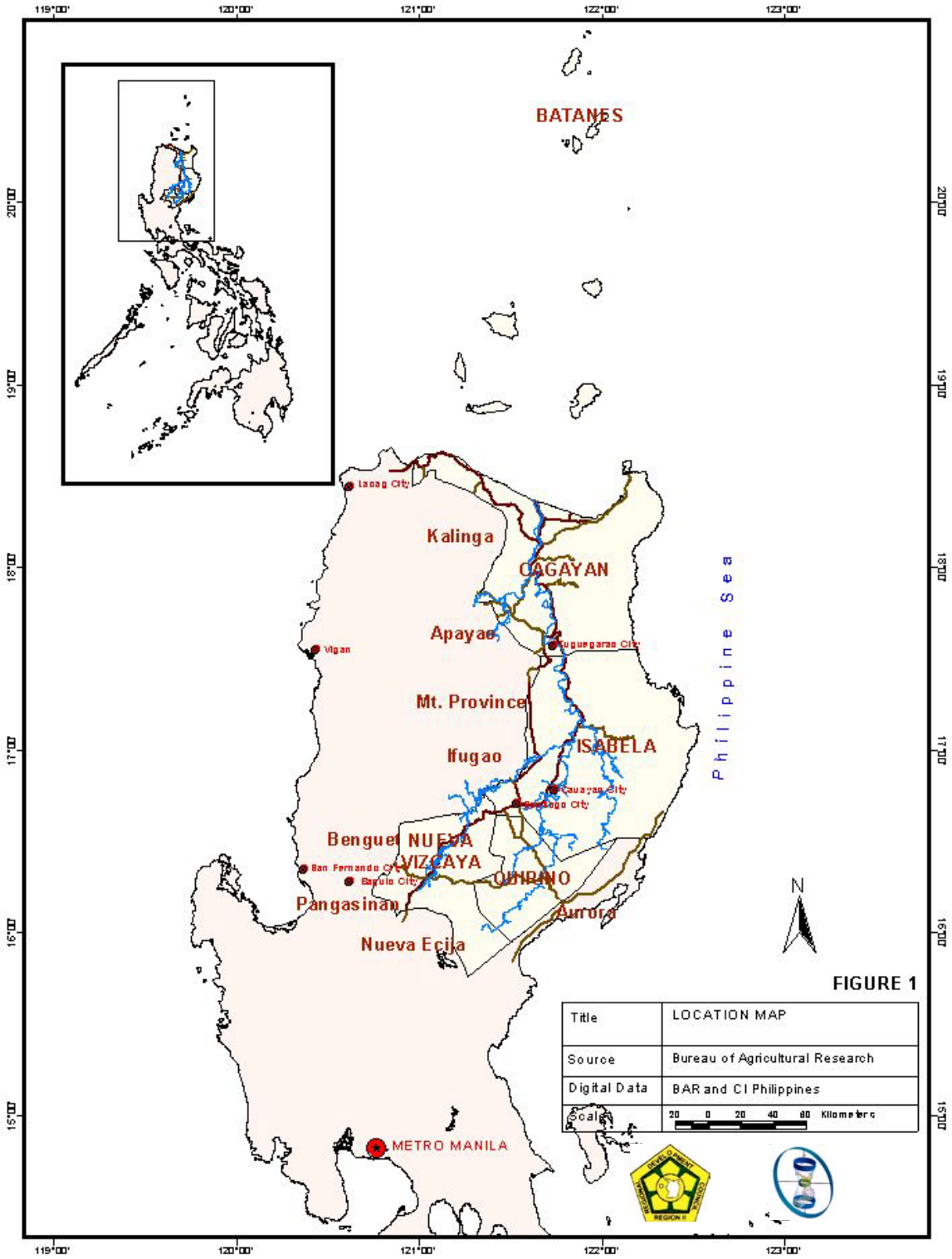


FIGURE 1: LOCATION MAP

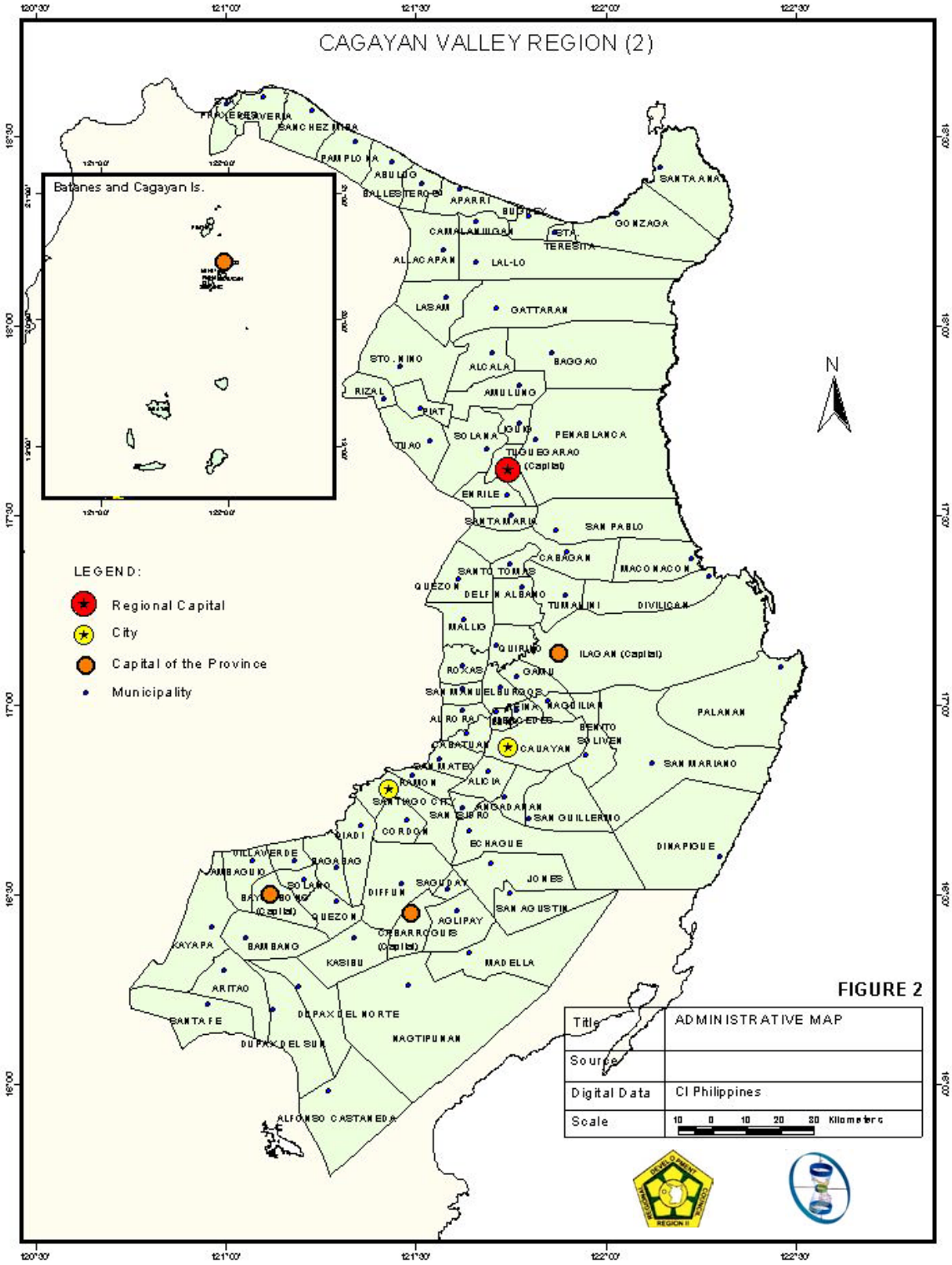


FIGURE 2: ADMINISTRATIVE MAP

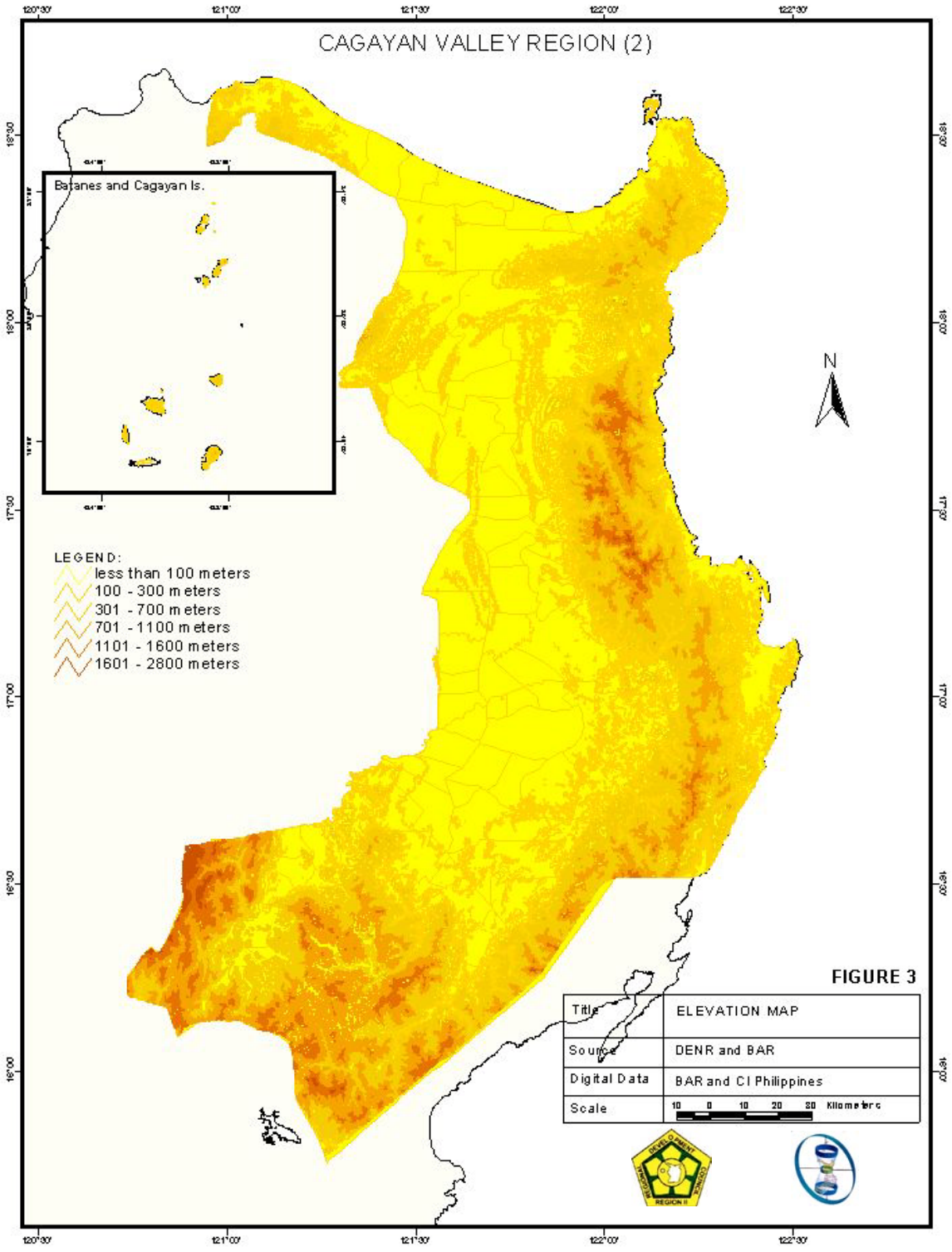


FIGURE 3: ELEVATION MAP

Table 1. Land Area and Slope Classification, Region II By Province
As of 2000

LAND AREA/ SLOPE	REGION II		BAT.	CAG.	ISA.	VIZ.	QUI.
	Area (Has)	% Dist.	Area (Has)	Area (Has)	Area (Has)	Area (Has)	Area (Has)
Total Land Area	2,685,836	100.00	23,000	906,270	1,066,456	390,390	305,720
Slope							
0 – 3 %	665,390.50	24.79	1,065	253,831	343,615	56,193	17,186
3 – 8%	163,364.00	6.08	566	54,763	54,763	1,976	25,910
8 – 18%	367,723.30	13.69	3,373	12,316	12,316	4,230	23,962
18 – 30%	407,656.40	15.17	8,257.44	153,665	153,665	20,103	65,916
30 – 50 %	717261.00	13.26	3,245.40	94,030	94,030	87,415	47,461
50 and above	717,261	26.71	6,532..00	223,595	222,595	224,451	111,940
Reservoir	7986	0.3	0.00	0.00	0.00	1,627	4,175

Source: ALMED, Bureau of Soils and Water

a.5 Climate

The region falls under four climate types generally characterized by Type III, not very pronounced seasons or dry from November to April and wet during the rest of the year in the region's western flank or valley areas; Type IV with rainfall more or less evenly distributed throughout the year in the region's eastern flank, Type II in the island municipalities of Batanes Province and Type I with two pronounced seasons, dry from November to April and wet during the rest of the year in the western portion of the province of Nueva Vizcaya and the northwest tip of Cagayan province (**Figure 6**). Rainfall varies from 1600 mm. in the valley areas to 4400 mm. in the mountainous areas. Regional annual average rainfall is 2600 mm. Temperature ranges from a low of 17°C during the period of November to February, to a high of 35°C during the months of April to June, with May as the warmest and January the coldest months. High humidity prevails, ranging from 70% and 90%, with an annual mean of 76%. Tropical storms are common between May and November, averaging about twelve per year. .

a.6 Hydrology

The region has the largest possible dam and reservoir sites among all regions in the country. It also has the biggest river basin, the Cagayan River Basin, with a drainage area of about 2,730,00 hectares and groundwater reserve of 47,895 MCM (**Figure 7)**. Groundwater storage capacity is placed 11,850 MCM with estimated gross inflow of 7,186 MCM and net inflow of 3,593 MCM per year. The Cagayan River has three major tributaries: Ilagan River which drains a major portion of the eastern watersheds, Magat River which draws water from the southern portions, and Chico River covering northwest areas.

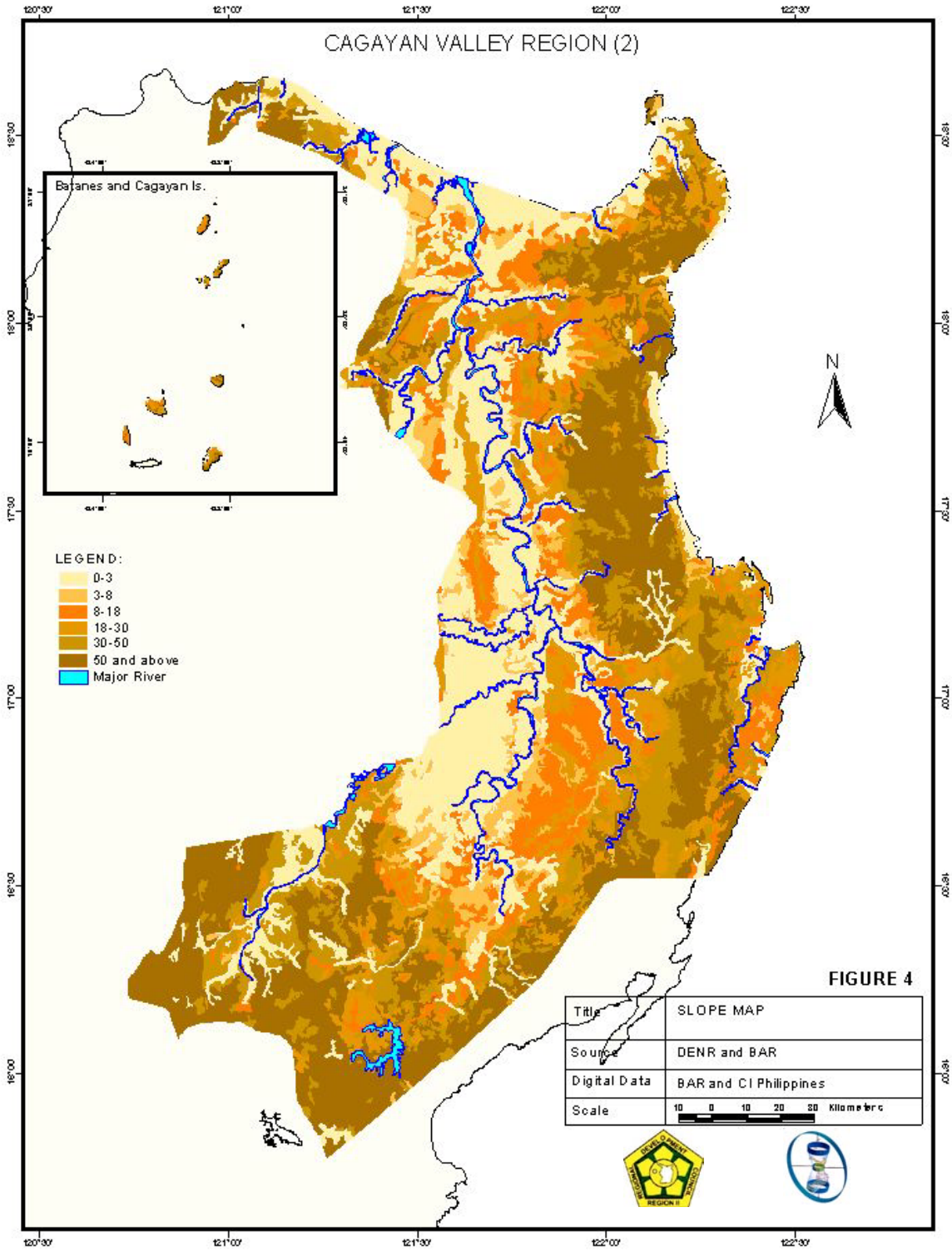


FIGURE 4: SLOPE MAP

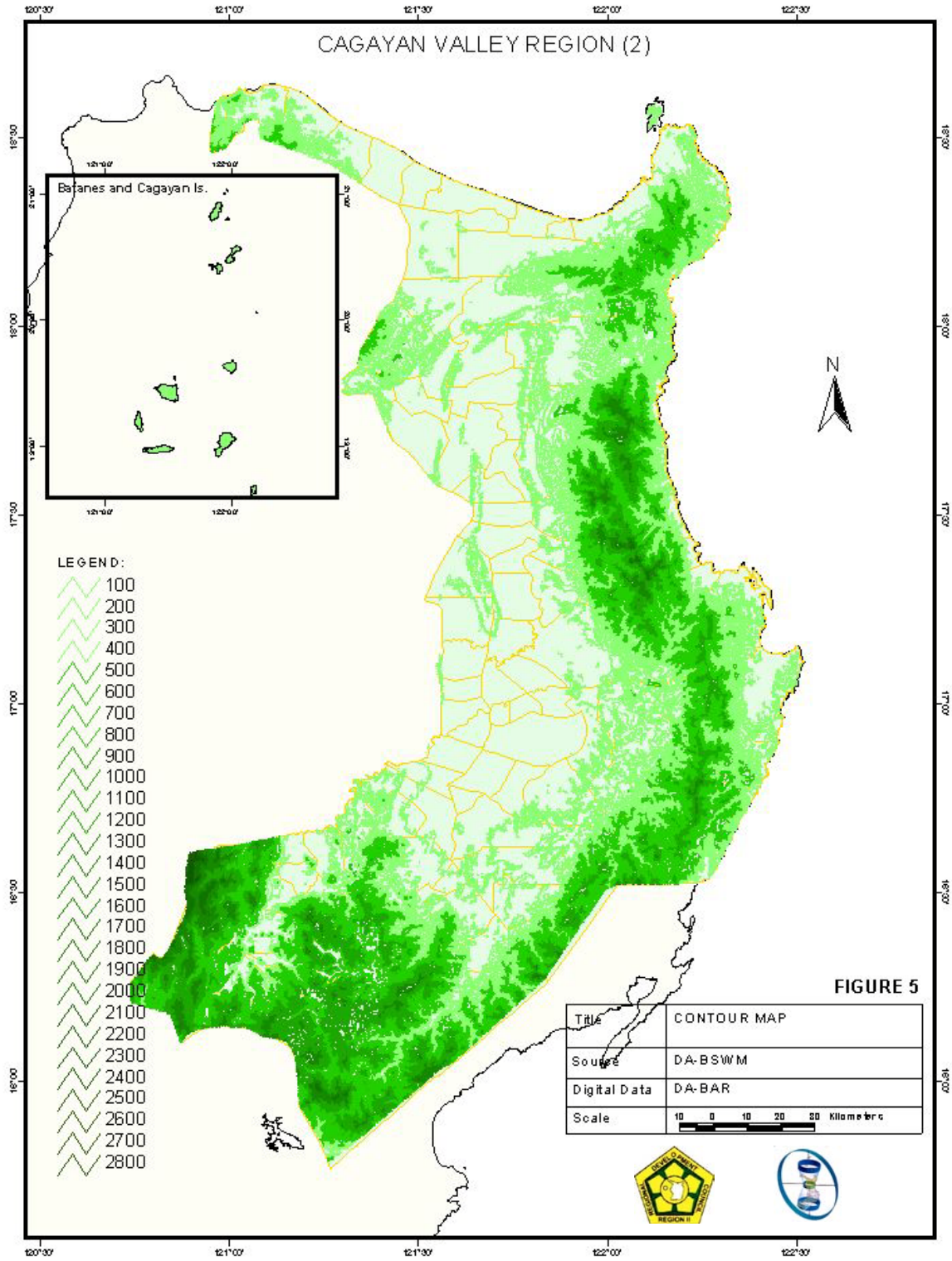


FIGURE 5: CONTOUR MAP

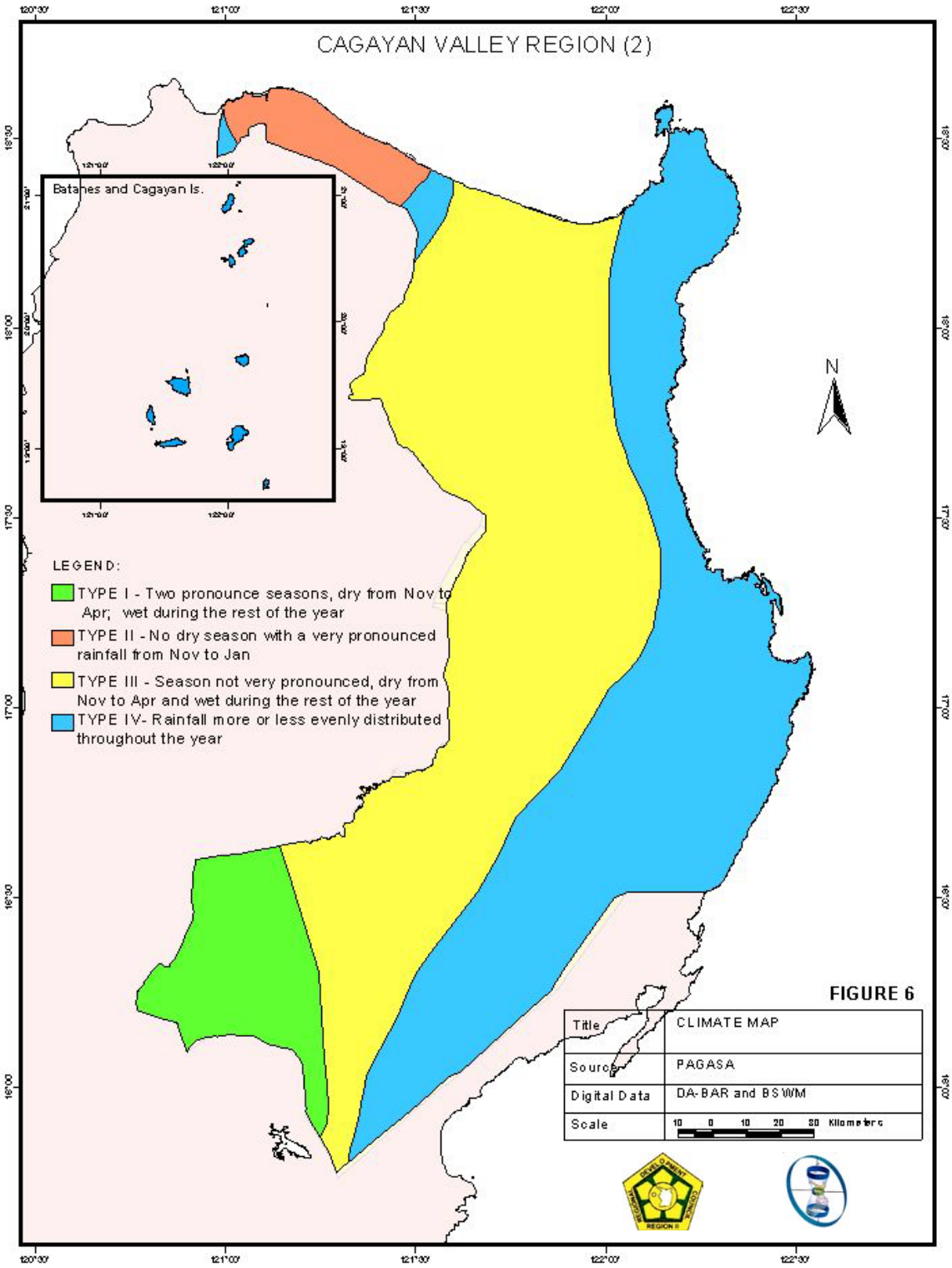


FIGURE 6: CLIMATE MAP

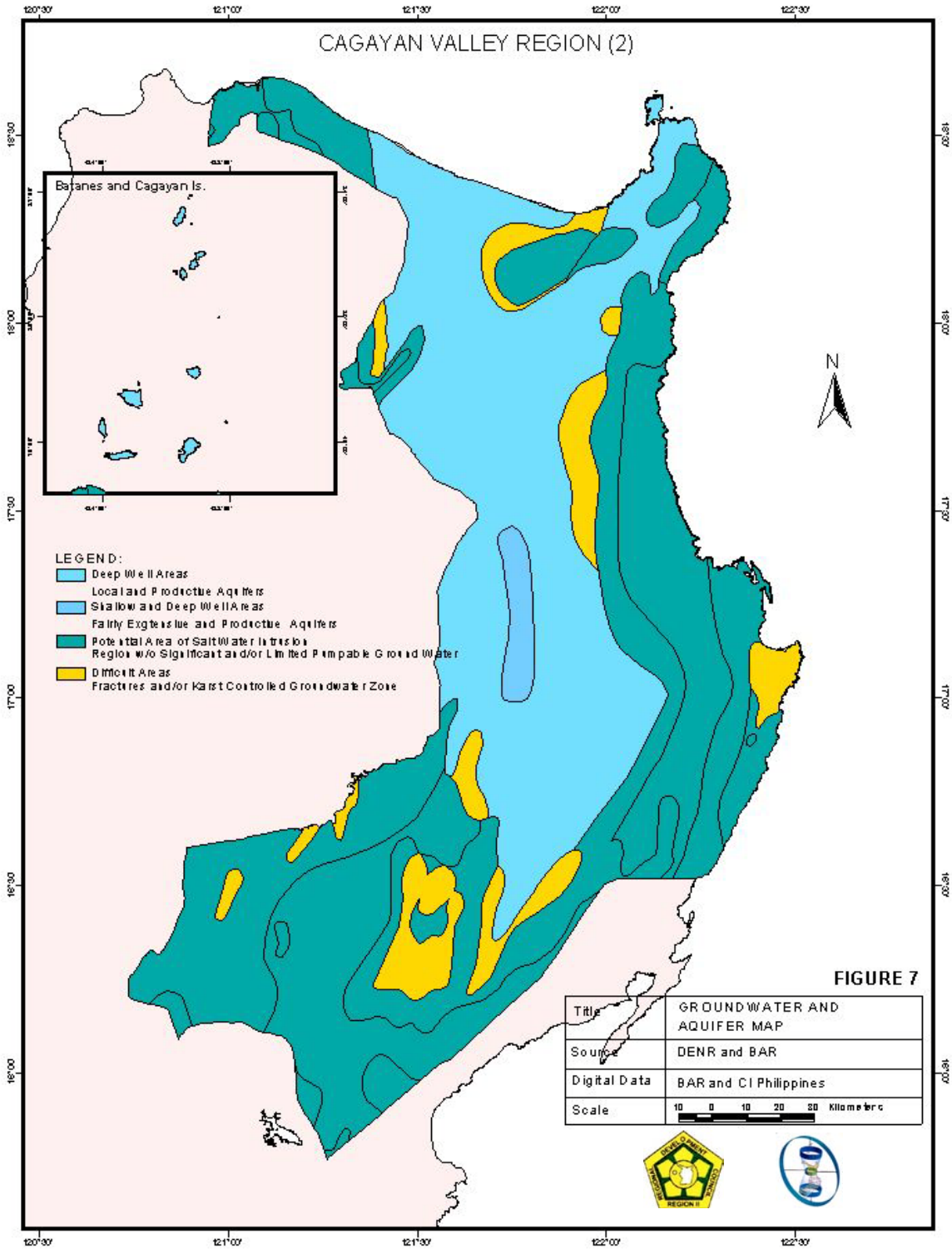


FIGURE 7: GROUND WATER MAP

Both inland and marine waters make up a considerable resource. Rivers, swamps and lakes have an aggregate area of 22,724 hectares. There are about 890 kms. of coastline and rich fishing grounds, particularly within the Babuyan and Balintang Channels on the north and the Palanan and Divilacan Bays on the east, including its territorial seas within the 200 kms. Exclusive Economic Zones (EEZs).

a.7 Land Use Opportunity

Based on land use opportunity, about 15,881 sq. kms. (59%) of the total land area is best suited for forest and wildlife. About 988,000 hectares (37%) is suitable for crops, 929 sq. kms. (3%) for built-up and other special uses, and 168 sq. kms. for fishponds and mangroves. Of its total potential cropland, about 5,897 sq. kms. (60%) is suitable for rice and corn; 463 sq. kms. (5%) for vegetables and other rootcrops; and 3,307 sq. kms. (35%) for fruit trees and other permanent crops **(Table 2).**

a.8 Ecological Features

There are several minor faultlines but most of these are inactive. Only the Digdig Fault is considered active as manifested by the 1990 killer earthquake **(Figure 8).** There are also about four minor volcanoes located in the province of Cagayan and off its northern coast. While these volcanoes are considered dormant, the Mt. Pinatubo tragedy and the reported Smoke emissions of one of these volcanoes (Mt. Didicas) off Camiguin Island, necessitate the conduct of studies and preparation to anticipate their possible reactivation**.**

Table 2. LAND USE OPPORTUNITY, REGION 2: BY PROVINCE

LAND OPPORTUNITY	REGION		BATANE		CAGAYA		ISABELA		NUEVA		QUIRIN	
	AREA (HAS.)	% DISTRIBUTION	AREA (HAS.)	% DISTRIBUTION	AREA (HAS.)	% DISTRIBUTION	AREA (HAS.)	% DISTRIBUTION	AREA (HAS.)	% DISTRIBUTION	AREA (HAS.)	% DISTRIBUTION
TOTAL LAND AREA	2,685,836	100	23,000	100	900,270	100	1,066,456	100	390,390	100	305,720	100
AGRICULTURE	988,053	37	19,980	87	278,500	31	523,031	49	114,100	30	52,442	17
AGRICULTURE EXPANSION AREA	636,391	24	9,293	40	190,033	21	339,923	32	60,600	16	36,542	12
	351,662	13	10,687	46	88,467	10	183,108	17	53,500	14	15,900	5
FORESTRY	1,588,087	59	2,737	12	587,375	65	483,097	45	266,569	68	248,309	81
PRESERVATION	1,272,876	47	2,156	9	546,775	61	395,381	37	129,355	33	199,209	65
REHABILITATION AREA	315,211	12	581	3	40,600	5	87,716	8	137,214	35	49,100	16
WETLAND	16,755	1	0	0	15,785	2	970	0	0	0	0	0
MISCELLANEOUS TYPE	92,941	3	283	1	18,610	2	59,358	6	9,721	2	4,969	2

SOURCE OF DATA: ALMED, Bureau of Soils and Water Management, DA Region II

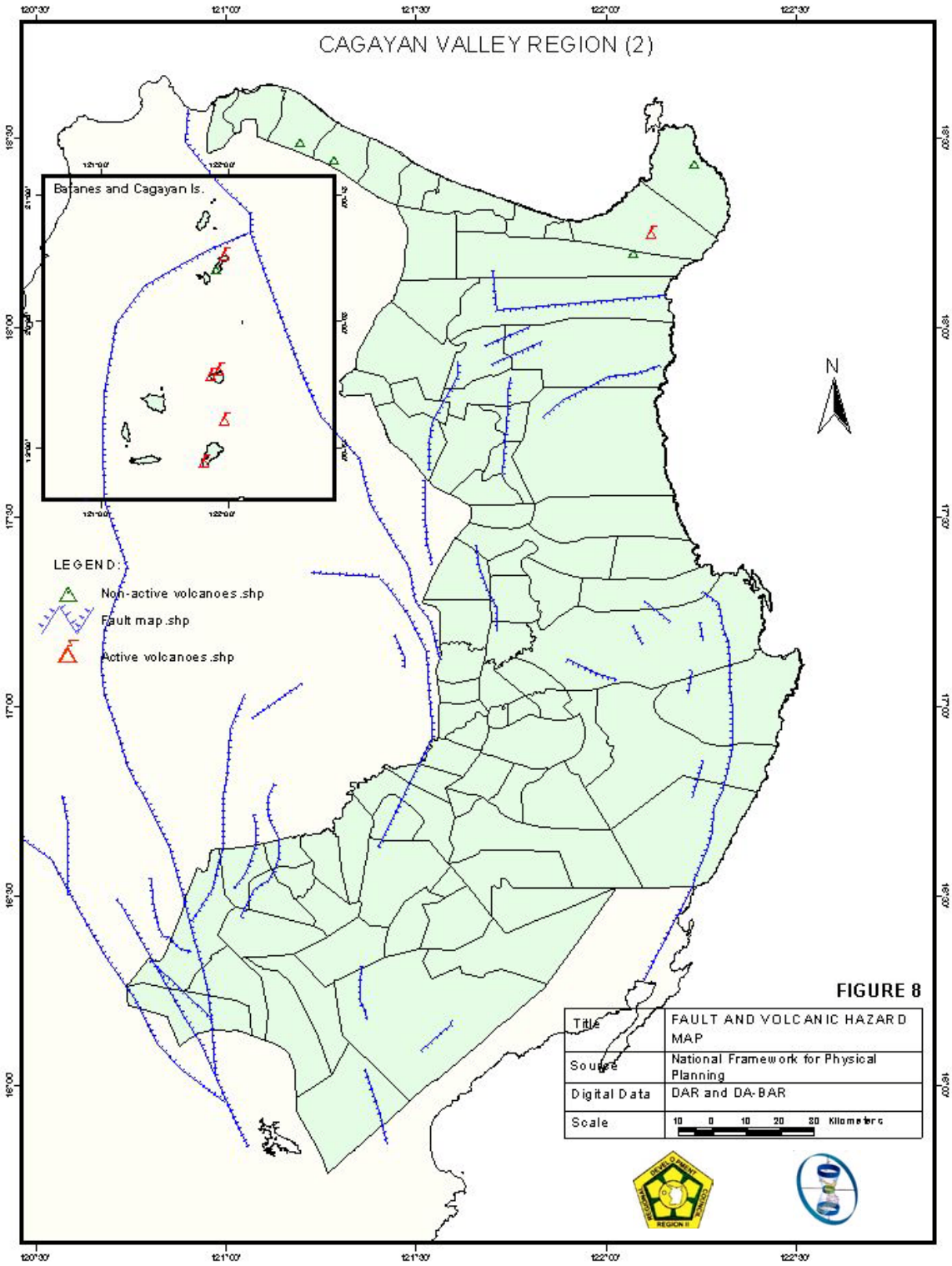


FIGURE 8: FAULT LINES AND VOLCANIC HAZARD MAP

B. POPULATION CHARACTERISTICS

b.1 Population Level

As of Censal Year 2000, total regional population was estimated at 2,813,159 persons. Despite having the fourth largest land area, the region's total population count is 6th lowest among all regions of the country. During the same year, total regional population accounted for about 3.68 percent of the national total ***(Table3).*** For the past 20 years, the regional percentage share to the national total population has been decreasing, from 4.22 percent in 1980 to 3.68 percent in censal year 2000 ***(Table4).***

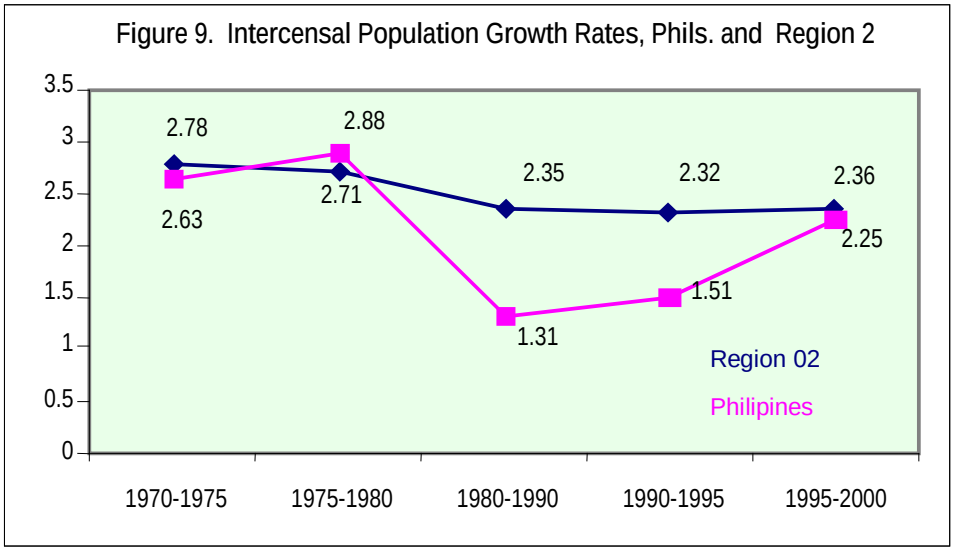
Table 3. Population Levels and Percent Distribution
Philippines, May 2000 Census of Population

REGION	May 2000	% Share
Philippines	76,498,735	100.00
IV	11,793,655	15.42
NCR	9,932,560	12.98
III	8,030,945	10.50
VI	6,208,733	8.12
VII	5,701,064	7.45
XI	5,189,335	6.78
V	4,674,855	6.11
I	4,200,478	5.49
VIII	3,610,355	4.72
IX	3,091,208	4.04
II	2,813,159	3.68
X	2,747,585	3.59
XII	2,598,210	3.40
ARMM	2,412,159	3.15
XIII	2,095,367	2.74
CAR	1,365,220	1.78

Source: National Statistics Office, May 2000 CPH

b.2 Inter-Censal Population Growth Rates

Population growth rate has been steadily decreasing from 1975 to 1990. In 1995, however, the region's population growth rate started an upward trend - reaching a 2.25 percent Annual Average Growth Rate (AAGR) in Year 2000. Except during the period 1975 to 1980, the region's population growth rate has always been lower compared to that of the national average ***(Figure 9).***



For the past 25 years or from 1975 to 2000, the Provinces of Quirino registered the fastest growth in population at an annual average growth rate (AAGR) of 3.26 percent followed by Nueva Vizcaya at 2.29 percent. The province with the slowest growth in population is Batanes at 1.32 percent followed by Cagayan with 1.75 percent AAGR from 1975 to 2000. In terms of growth trend, Nueva Vizcaya is the lone province with a steadily decreasing population growth rate from 1975 t0 2000. The provinces of Cagayan, Isabela and Quirino showed slight increases in their respective growth rates in Year 2000 compared with their previous rates in 1995 while the Province of Batanes showed a fluctuating trend in population growth ***(Table 4).***

Table 4. Population Growth Rate, Region 2 by Province
Censal Years 1975 to 2000

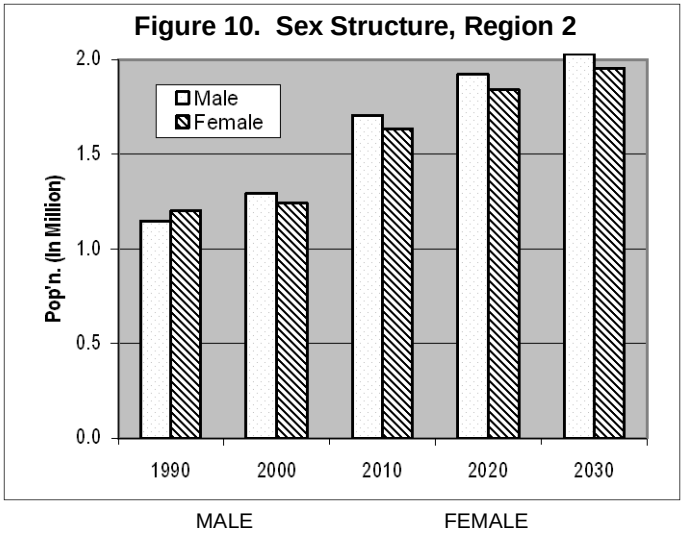
PROVINCE	Annual Average Growth Rate (AAGR)				
	1975-1980	1980-1990	1990-1995	1995-2000	1975-2000*
Batanes	0.37	2.2	-1.08	3.25	1.32
Cagayan	2.01	1.55	1.43	2.26	1.75
Isabela	3.57	2.18	1.35	2.25	2.26
Nueva Vizcaya	2.54	2.22	2.01	1.97	2.29
Quirino	4.82	3.21	2.63	2.71	3.31
Region 2	2.88	1.31	1.51	2.25	2.12

Source: Philippine Statistical Yearbook, 2001
** Computed using the geometric formula of computing the AAGR*

b.3 Sex Structure

In terms of sex structure, males outnumber the females at a ratio of 104 males for every 100 females in CY 2000. In 1990, females dominated the population structure with a ratio of 102 females for every 100 males. However, after 2000, the region's male population accounted for the majority of the total population. The male population will continue to account for the majority of the total population in the coming years. By year 2030, there may be about 103 males for every 100 female population in the region. This population structure is expected to be true for all of the region's five provinces ***(Figure 10).***

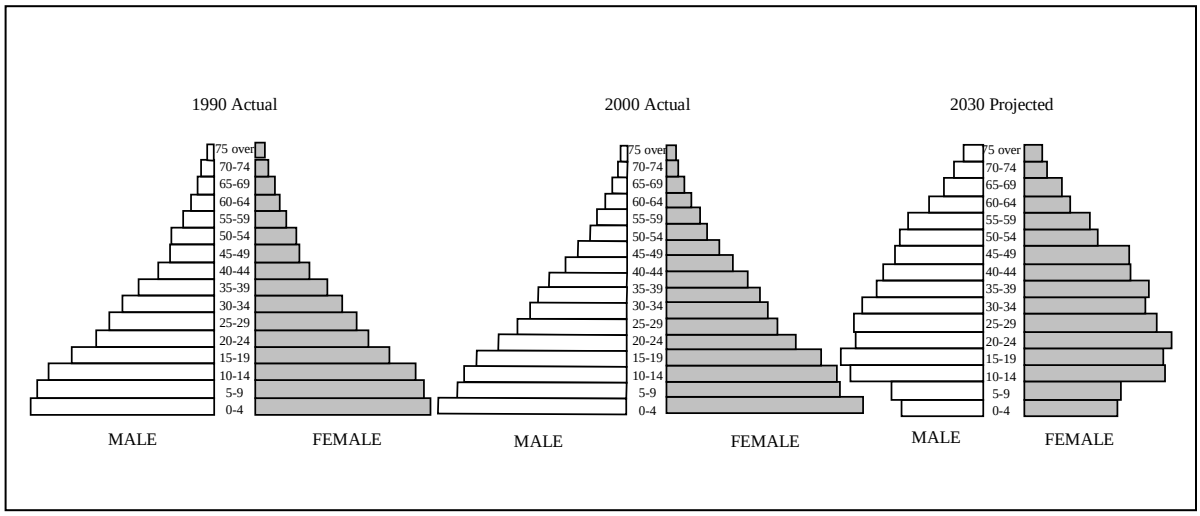
Figure 10. Sex Structure, Region 2



b.4 Age Structure

The region's 1990 and 2000 population structure follows the configuration of a typical pyramid. Its base or those within the group of 0-4 yrs for both males and females represent the highest share to the regional total and the proportion gradually diminishes in successively older ages. This structure may slightly change by Year 2030 due to the anticipated decrease in fertility rate and an increase in the life expectancy rate. With these assumptions, the proportion of those within the young age groups may decline while the older age groups may increase their share to the regional total by year 2030 compared to their levels in 1990 and 2000 ***(Figure 11)***.

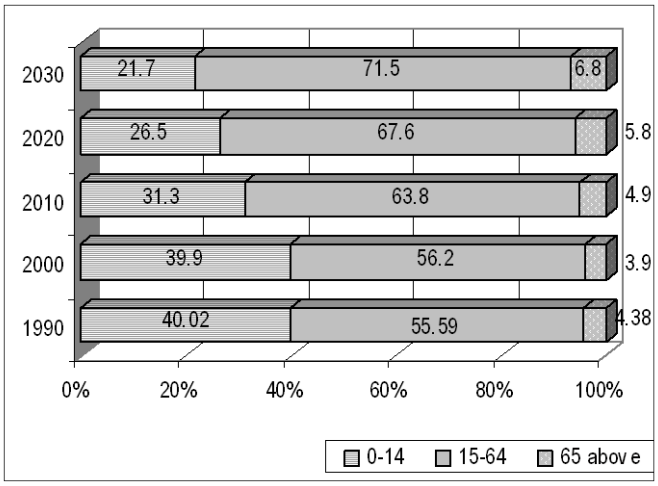
Figure 11. Population Structure, by sex and age bracket
Region 2: 1990, 2000 (actual) and 2030 (projection)



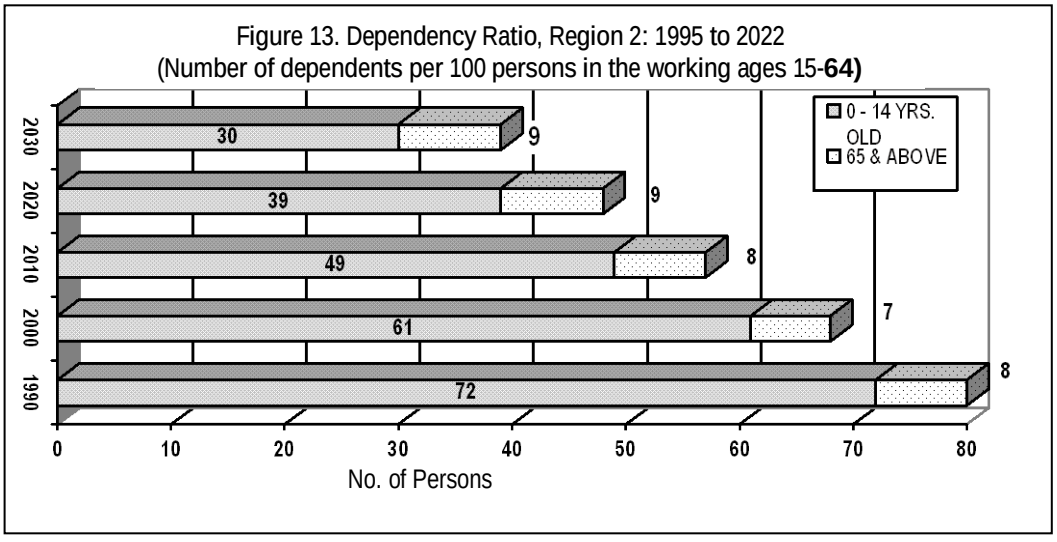
b.5 Dependency Ratio

In 1990, there were more persons belonging to the age group of 15 – 64 (working age) than those in the combined age groups of 0 -14 and 65 above (dependency age). By Year 2030, the proportion of 15 - 64 age group may further increase to 71.5 percent, as the population gradually shifts to a relatively older age structure. The group of "at least 65 years old" is projected to increase its share to 6.8 percent in 2030 from 4.38 percent in 1990. Consequently, the proportion of 0-14 age group may decrease to 21.7 percent of the total population in CY 2030 from 40.02 percent in 1990.

Figure 12. Actual & Projected Proportion of Age Groups, Region 2: 1990 and 2000 (actual), 2010-2030 (projected)



Given the region's actual and projected age structure, the region's working age population may have less to support in the future compared to the levels registered in 1990. In absolute terms, there are about 80 dependents, broken down into 72 persons aged 0-14 and 8 persons aged 65 yrs. and above, for every 100 persons in the working ages of 15 – 64 yrs. old in 1990. This may decrease to 48 dependents or 39 persons under 15 years old and 9 persons over 65 years old for every 100 workers by Year 2030.



C. REGIONAL ECONOMY

c.1 Gross Regional Domestic Product (GRDP)

In Year 2000, the region's GRDP posted a total value of P21.6 Billion at constant 1985 prices. It had the lowest GRDP value among regions comprising the Island of Luzon. The National Capital Region's (NCR) GRDP is thirteen (13) times more than that of the region's domestic output in 2000. Since 1995, Its contribution to the national gross domestic product averaged about 2 percent, the third lowest among regions in the country (***Table 5***).

Table 5. Gross Regional Domestic Product by Region, 1990, 1995 and 2000
(in Million Pesos at Constant 1985 Prices)

Region	1990		1995		2000	
	Value	%Dist.	Value	%Dist.	Value	%Dist.
Philippines	720,691	100	802,224	100	954,962	100
NCR	221,753	30.77	242,167	30.19	296,859	31.9
CAR	13,549	1.88	16,075	2.00	22,278	2.33
Region I	21,869	3.03	24,225	3.02	30,326	3.18
Region II	15,548	2.16	16,142	2.01	21,600	2.26
Region III	68,250	9.47	78,487	9.78	84,970	8.90
Region IV	109,509	15.20	125,248	15.61	144,996	15.18
Region V	21,687	3.01	23,517	2.93	25,918	2.71
Region VI	50,747	7.04	57,597	7.18	67,001	7.02
Region VII	47,193	6.55	52,327	6.52	65,031	6.81
Region VIII	17,322	2.40	18,969	2.36	22,956	2.40
Region IX	21,132	2.93	21,183	2.64	27,001	2.83
Region X	37,099	5.15	41,866	5.22	36,515	3.82
Region XI	50,074	6.95	53,501	6.67	60,275	6.31
Region XII	24,959	3.46	22,174	2.76	25,721	2.69
ARMM			8,116	1.01	9,179	0.96
CARAGA					14,336	1.50

Source: 2000 Philippine Statistical Yearbook
National Statistical Coordination Board, Regional Accounts July 2001 release

c.2 Gross Value Added (GVA) by Sector

There has not been a significant change in the region's economic structure. Agriculture remains as the major contributor to GRDP and its proportion to GRDP slightly increased to 54 percent in 2000 from its share of 45 percent in 1975. In contrast, the contribution of the industry sector decreased from 19.6 percent share to GRDP in 1975 to 14 percent in 2000. Services sector dipped from 34.4 percent in 1975 to 32 percent in 2000 ***(Table 6).***

While the value of agricultural output increased by about 96 percent from 1975 to 2000, the industry and service sectors fared comparatively slower with increases of 20 percent

and 53 percent, respectively ***(Figure14).*** Among the regions, Region 02 has the second largest agriculture share and the least industry contribution to total regional production. Further, Region 02 is one of the regions that maintained the prominence of agriculture while other regions gradually shifted to industry or services.

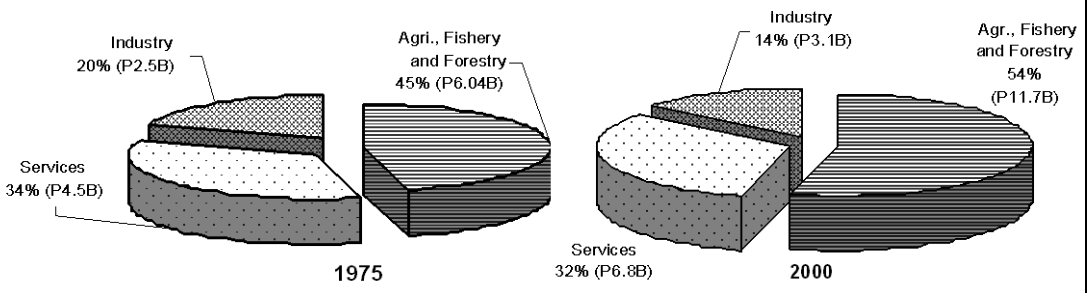
Until 2000, the region still tends to concentrate on rice and corn and has not significantly diversified to commercial crops production. This limited the development of other agri-processing activities.

Table 6.Proportion of Gross Regional Domestic Product By Industrial Origin, 1975 - 2000

REGION 2	AGRICULTURE				INDUSTRY				SERVICES			
	1975	1985	1995	2000	1975	1985	1995	2000	1975	1985	1995	2000
Philippines	24.7	24.6	21.5	19.9	38.4	35.1	35.4	34.4	36.9	40.4	43.1	45.6
NCR	0.0	-	-	0.0	54.4	45.9	41.6	38.8	45.6	54.1	58.4	61.1
CAR	-	-	21.1	12.8	-	-	53.8	64.4	-	-	25.1	22.7
I	39.2	36.4	43.6	42.5	22.5	28.3	16.5	16.3	38.2	35.2	39.9	41.1
II	45.0	44.7	54.4	54.3	19.6	20.2	11.5	14.1	34.4	35.1	34.1	31.5
III	21.2	21.4	22.0	22.7	43.4	41.1	44.1	39.7	35.4	37.4	33.9	37.4
IV	27.6	30.1	26.1	24.1	45.4	39.4	43.5	41.4	26.9	30.5	30.4	34.4
V	47.5	43.9	37.4	32.3	13.5	19.3	21.2	21.4	39.0	36.8	41.4	46.2
VI	35.9	35.6	32.4	30.5	26.6	25.1	23.7	24.4	37.5	39.4	43.8	45.0
VII	15.3	15.9	14.8	13.0	36.2	33.1	29.7	30.3	48.6	51.0	55.5	56.7
VIII	40.8	38.1	31.2	29.5	23.9	30.5	34.6	37.2	35.3	31.4	34.2	33.3
IX	53.1	53.5	51.5	50.6	14.8	13.7	16.9	17.3	32.1	32.7	31.6	32.0
X	38.2	37.6	37.0	27.1	31.4	30.2	26.7	32.2	30.4	32.2	36.3	40.7
XI	49.0	46.9	37.2	35.8	22.1	22.1	26.0	25.2	28.9	31.0	36.8	39.0
XII	44.6	45.2	34.1	35.6	31.2	31.6	39.3	36.9	24.2	23.2	26.5	27.4
XIII	-	-	-	58.3	-	-	-	14.5	-	-	-	27.2
ARMM	-	-	60.2	35.1	-	-	15.0	33.2	-	-	24.7	31.5

Source: National Statistical Coordination Board

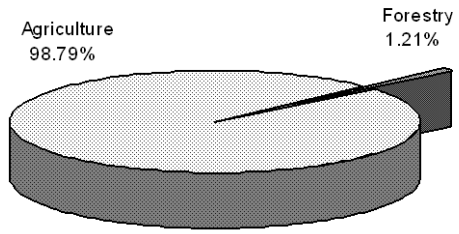
Figure 14. Percent Distribution of GRDP By Sector GVA, Region 2 1975 and 2000



c.3 GVA by Sub-Sector

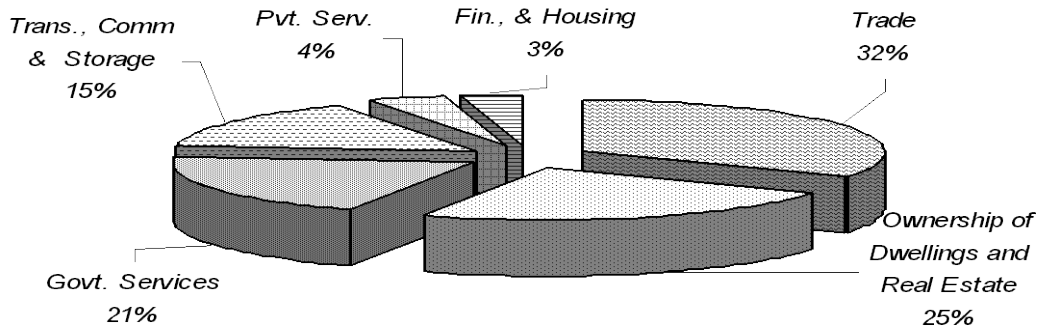
The Agriculture and Fisheries Sub-sector comprises about 98.79 percent **(*Figure 15)*** of the total GVA for Agriculture, Fisheries and Forestry (AFF) in 2000. The bulk of this production comes from grains. The share of forestry is merely 1.21 percent of the AFF Sector's GVA and is at a decreasing trend due to the implementation of the national policy on selective logging since 1992.

Figure 15. Percent Distribution of Agriculture GVA Region 2, CY 2000



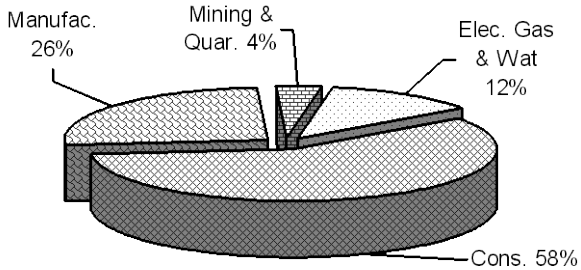
On the other hand, the dominant component of the Services Sector is Trade with a share of 32 percent **(*Figure 16)*** of total GVA. Specifically, the Trade sub-sector is represented by firms involved in the wholesale and retail of consumer products. Other major sub-sectors are Ownership of Dwellings and Real Estate at 25 percent, Government Services at 21 percent and Transportation, Communication & Storage at 15 percent.

Figure 16. Percent Distribution of Service Sector GVA Region 2, CY 2000



For the Industry Sector, Construction represents the bulk at 58 percent ***(Figure 17)*** followed by Manufacturing at 26 percent of the sector's GVA. Construction activities are those undertaken by the government and private sector. The manufacturing sub-sector is composed mainly of small-scale firms engaged in food processing and manufacture of home/office furniture and fixtures. Utilities or Electricity, Gas and Water represents 12 percent of the Sectors GVA and the least is Mining and Quarrying with only 4 percent. The low GVA share for utilities shows the low

Figure 17. Percent Distribution of Industry Sector GVA, Region 2 CY 2000

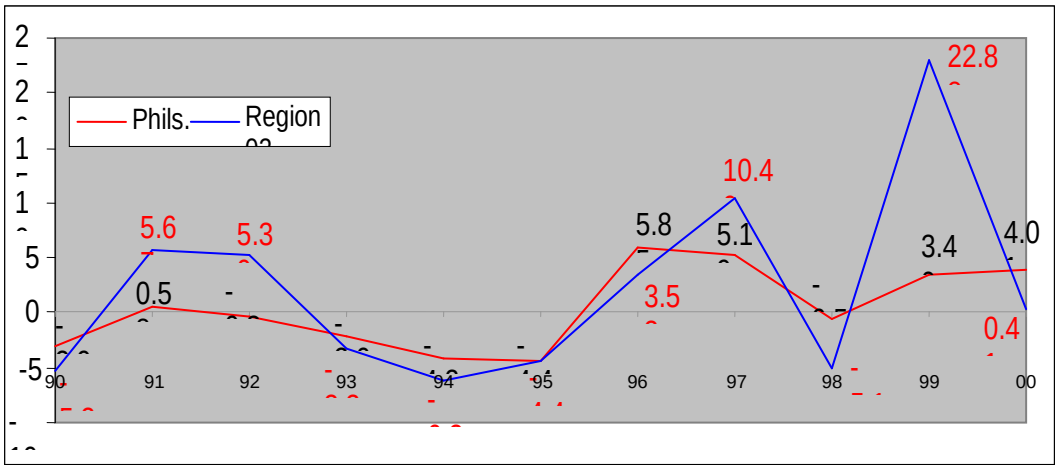


level of development of the region's potential energy sources. Mining and quarrying activities are very limited in scale with most of the GVA share contributed mainly by quarrying as a support to the construction industry.

c.4 GRDP Growth Trends

The growth in Gross Regional Domestic Product (GRDP) was erratic from 1990 to 2000. GRDP growth was not sustained as the economy was negatively affected by factors such as the 1990 earthquake, unfavorable weather particularly in 1998 and the Asian economic crisis **(Figure 18**). Measured in terms of percent growth with 1990 as the base year, the region's GRDP increased by 22.88 percent in 1999 which is much higher than that of the national increase of 3.40 percent.

Figure 18. GDP and GRDP Growth Rates, Phils. and Region 2: 1990-2000



c.5 Sectoral GVA Growth Trends

The Agriculture, Fishery and Forestry sector performed well in the past five years except in 1998 where its GVA decreased by 20.74 percent. This negative growth is due to the occurrence of the El Nino Phenomenon that specifically affected the agriculture sub-sector, and which in turn pulled down the overall growth in GRDP during the year. The Forestry sub-sector posted a continuing decline in GVA due to the implementation of the logging ban. In 1999, the sector's GVA grew by 29.34 percent as agriculture recovered from the effects of the El Nino but this was not sustained in year 2000 as the slump in rice and corn production resulted to a negative growth of 0.23 percent for the sector.

On the other hand, the Industry Sector posted a sustained growth starting in 1996 from a -7.34 percent in 1995. The double-digit growth rates exhibited in 1996 to 1999 is an indication of the region's potentials in developing industries supportive to its overall development. Major sources of growth for the sector are the Construction and Manufacturing sub-sectors. In 2000, however, Industry GVA declined by 4.82 percent due to the slowdown in construction activities as a result of the economic crisis.

The Services Sector was relatively the most stable with its GVA sustaining a single-digit growth for the past five years. Major sources of growth include the sub-sectors on: Government Services; Transportation, Communication and Storage; and Trade.

Table 7. GRDP and GVA Growth Rates, Region 2 : 1995 to 2000

SECTOR	Annual Growth Rate (in %)					
	1995	1996	1997	1998	1999	2000
Agriculture, Fishery and Forestry	***7.09***	***4.59***	***8.20***	***-20.74***	***29.34***	***-0.23***
Agriculture	8.47	1.19	13.20	-20.90	29.19	-0.27
Forestry	-118.32	55.80	-591.85	-4.21	42.32	2.74
Industry	***-7.34***	***11.11***	***8.22***	***17.87***	***13.69***	***-4.82***
-Mining and Quarrying	61.67	26.38	-17.45	-13.25	-8.63	-1.06
-Manufacturing	-52.23	5.85	4.77	-1.89	5.35	7.96
-Construction	10.29	14.29	15.24	-58.42	65.64	-12.58
Electricity, Gas and Water	12.88	5.57	2.92	2.41	2.32	4.09
Services Sector	***4.12***	***5.63***	***5.14***	***4.41***	***1.80***	***3.85***
-Transportation, Commerce and Storage	8.76	8.97	8.48	1.12	3.64	9.08
-Trade	5.28	3.58	5.20	8.06	3.10	6.97
-Finance and Housing	3.73	6.59	10.19	2.45	1.85	1.74
-Ownership of Dwellings and Real Estate	2.16	2.93	2.56	1.30	-0.76	-1.22
-Private Services	5.17	5.87	6.35	4.44	1.67	5.33
-Government Services	1.60	9.67	4.79	5.41	1.59	0.71
GRDP	**4.68**	**3.53**	**10.40**	**-5.12**	**22.88**	**0.41**

Source: National Statistical Coordination Board

D. LABOR AND EMPLOYMENT

d.1 Labor Force Participation

The proportion of population aged 15 years and above joining the labor force has been increasing for the past 10 years. The region's Labor Force Participation Rate (LFPR) of 66.7 percent in 1990 peaked to about 72.7 percent in 1994 and gradually tapered to 68.6 percent in 2000. In absolute levels, an average of 35,000 join the labor force per year from 1990 to 2000 **(***Table 8***).** Participation in the labor market is more prevalent in the rural areas and among the male population. Among provinces, the province of Batanes registered the highest LFPR at 80.0 percent as of CY 2000 ***(Table 9*)**.

d.2 Employment and Underemployment

Employment levels on the other hand increased from 953,000 in 1990 to 1,266,000 in 2000. This translates to an average of 32,000 jobs created yearly. This 2.88 percent annual growth in employment was not fast enough to meet new labor requirements. Thus, regional unemployment levels increased from 46,000 in 1990 to 88,000 unemployed in 2000. In terms of rate, however, unemployment rate is only 6.5 percent in 2000 from 4.6 percent in 1990. This unemployment rate is relatively low considering that population has been increasing fast over the ten-year period widening the base of the workforce. Inspite of this, the region showed an improving capacity to provide adequate productive full employment as indicated in the decreasing trend in underemployment from 21.4 percent in 1991 to 13.4 percent in 2000.

Table 8. Labor and Employment
Region 2: 1990 to 2000 (October Round Labor Force

INDICATOR	YEAR											Growth Rate
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	1990-2000
Popn 15 Years Old and Over	1,497	1,544	1,592	1,641	1,691	1,741	1,787	1,835	1,885	1,935	1,973	2.80
Labor Force ('000)	998	1,033	1,119	1,185	1,229	1,241	1,262	1,281	1,293	1,349	1,353	3.09
LFPR (%)	66.7	66.9	70.3	72.2	72.7	71.3	70.6	69.8	68.6	69.7	68.6	-
Employed ('000)	953	953	1,054	1,137	1,173	1,208	1,225	1,235	1,240	1,299	1,266	2.88
Unemployed ('000)	46	80	65	47	57	34	37	46	53	50	88	5.70
Employment Rate (%)	95.4	92.3	94.2	96	95.4	97.3	97.1	96.4	95.9	96.3	93.5	-
Underemployment Rate (%)		21.4	16.6	19.9	22.8	17.5	19.1	17.2	22.1	15.3	13.4	-

Source: National Statistics Office Quarterly Labor Force Survey

** Based on July Round Labor Force Survey*

Table 9. Labor Force Participation Rate (LFPR) By Area and Sex Region 2: By Province CY 2000

Total	Batanes	Cagayan	Isabela	N. Vizcaya	Quirino	Region2
By Area	80.0	72.1	68.4	77.6	75.0	68.6
Urban	75.0	65.0	67.5	73.1	66.6	67.0
Rural	83.3	73.5	68.7	79.1	76.3	71.3
By Sex	80.0	72.1	68.4	77.6	75.0	68.6
Male	80.0	85.0	81.4	89.4	88.2	82.0
Female	80.0	59.6	54.9	69.0	57.7	56.9

Source: National Statistics Office Quarterly Labor

d.3 Employment By Sector and Sub-Sector

From 1990 to 2000, the regional employment structure did not significantly change. Agriculture remained as the region's major source of employment, representing about 60.97 percent and 60.47 percent of total employed in 1990 and 2000 respectively. Agriculture's share to total employment was even higher during the years between 1990 and 2000, reaching its peak at 67.24 percent in 1996 (***Table 10***).

The share of the Services Sector slightly increased to 31.62 percent in 2000 as wholesale and retail establishments; community, social and personal services; and the other sub-sectors contributed in generating additional jobs during the period under review. The Industry Sector's share decreased from 9.34 percent in 1990 to 7.91 percent in 2000. This is due to the decreasing employment levels in the manufacturing sub-sector, shrinking by 18.18 percent from 1990 to 2000.

Agriculture has generated the most jobs from 1990 to 2000 at 184,000 followed by Services with 117,000 jobs while Industry registered the lowest at 11,000 new jobs. In terms of growth rate, Services posted the highest rate at 29.25 percent compared to Agriculture's 24.05 percent and Industry's 11.0 percent.

d.4 Employment By Class of Worker

Of the total workforce, about 495,000 (40.44%) are wage and salary workers mostly engaged in agriculture; community, social and personal services; and trade. There are also 417,000 workers (34.07%) classified as "Own Account" workers, the bulk of which is engaged in agriculture and trade activities either as self-employed or employers. A significant number of about 190,000 (15.52%) work as unpaid family workers, mostly working in the rural areas and in the agriculture sector. In urban areas, wage and salary workers dominate at 47.01 percent of total urban workers (***Table 11***).

Table 10. Employment By Sector and Major Sub-sectors, Region 2: 1990 and 1995 to 2000
(Employment Levels in '000)

SECTOR	1990	1995	1996	1997	1998	1999	2000	% Increase (1990/2000)
Agriculture, Fishery and Forestry	581	**800**	**827**	**803**	**808**	**820**	**765**	24.05
(% Share)	*60.97*	*66.23*	*67.24*	*65.77*	*65.11*	*63.17*	*60.47*	
Industry	89	**78**	**100**	**87**	**76**	**76**	**100**	11.00
(% Share)	*9.34*	*6.46*	*8.13*	*7.13*	*6.12*	*5.86*	*7.91*	
Manufacturing	52	34	51	43	34	32	44	-18.18
(% Share)	*58.43*	*43.59*	*51.00*	*49.43*	*44.74*	*42.11*	*44.00*	
Construction	35	41	45	42	39	42	53	33.96
(% Share)	*39.33*	*52.56*	*45.00*	*48.28*	*51.32*	*55.26*	*53.00*	
Others*	2	3	4	2	3	2	3	33.33
(% Share)	*2.25*	*3.85*	*4.00*	*2.30*	*3.95*	*2.63*	*3.00*	
Services	**283**	**330**	**303**	**331**	**357**	**402**	**400**	29.25
(% Share)	*29.70*	*27.32*	*24.63*	*27.11*	*28.77*	*30.97*	*31.62*	
Wholesale and Retail	87	117	114	123	126	135	130	33.08
(% Share)	*30.74*	*35.45*	*37.62*	*37.16*	*35.29*	*33.58*	*32.50*	
Community, Social and Personal	143	167	136	144	165	184	192	25.52
(% Share)	*50.53*	*50.61*	*44.88*	*43.50*	*46.22*	*45.77*	*48.00*	
Others**	53	46	53	64	66	83	78	32.05
(% Share)	*18.73*	*13.94*	*17.49*	*19.34*	*18.49*	*20.65*	*19.50*	
TOTAL	**953**	**1208**	**1230**	**1221**	**1241**	**1298**	**1265**	24.66

Source: National Statistics Office Quarterly Labor Force
** - includes Electircity, Gas and Water (EGW) and Mining and Quarrying sub-*
*** - includes Transportation, Storage & Comumunication and Financing, Insurance, Real Estate and Business*

Table 11. Employed Persons By Class of Worker Region 2: By Province CY 2000

Total	Region 2	% Share
Total	**1,101,000**	**100.00**
Wage and Salary	495,000	40.44
Own Account	417,000	34.07
Unpaid Family Worker	190,000	15.52
Urban	**219,000**	**100.00**
Wage and Salary	118,000	47.01
Own Account	79,000	31.47
Unpaid Family Worker	21,000	8.37
Rural	**882,000**	**100.00**
Wage and Salary	376,000	38.60
Own Account	337,000	34.60
Unpaid Family Worker	168,000	17.25

Source: National Statistics Office Quarterly Labor Force Survey

E. SETTLEMENT DEVELOPMENT

e.1 Population Concentration

Provincial Distribution

There was no significant change in the distribution of the regional population among provinces from 1980 to 2000. Population remained concentrated in the provinces of Cagayan and Isabela with an aggregate share of 80.88 percent of the regional total in CY 2000, a slight decrease from 82.37 percent in 1980 ***(Table 12)***. The provinces of Isabela, Nueva Vizcaya and Quirino registered an increasing share to the total regional population within the 20-year period while the provinces of Cagayan and Batanes reflected a decreasing trend.

Table 12. Population Levels and Percent Distribution, Region 2:
By Province, Censal Years 1980, 1990 and 2000

PROVINCE	Total Population				% Share			
	1980	1990	1995	*2000	1980	1990	1995	2000
REGION 2	1,919,091	2,340,545	2,536,035	2,756,000	100.00	100.00	100.00	100.04
Batanes	12,091	15,026	14,180	16,000	0.63	0.64	0.56	0.58
Cagayan	711,476	829,867	895,050	952,000	37.07	35.46	35.29	34.54
Isabela	870,604	1,080,341	1,160,721	1,277,000	45.37	46.16	45.77	46.34
N. Vizcaya	241,690	301,179	334,965	365,000	12.59	12.87	13.21	13.24
Quirino	83,230	114,132	131,119	147,000	4.34	4.88	5.17	5.33
PHILIPPINES	45,501,995	57,308,359	64,838,757	72,345,000				
% Share of Region 2 to National Total					4.22	4.08	3.91	3.81

Source: National Statistics Office (NSO)

Municipal Distribution

Growth trends indicate that population is concentrated in municipalities located along the region's main access roads ***(Figure 19).*** As of CY 2000, about 16 percent of the regions population was located in the four (4) most populated cities/ municipalities which are: Tuguegarao City, Municipality of Ilagan, Cauayan City and Santiago City. The remaining 84 percent was distributed in 89 relatively small municipalities regionwide. Of the 93 cities/municipalities, about 77 percent or 72 municipalities had less than 40,000 population as of CY 2000. The municipal distribution of the region's population followed the same trend as that of 1990.

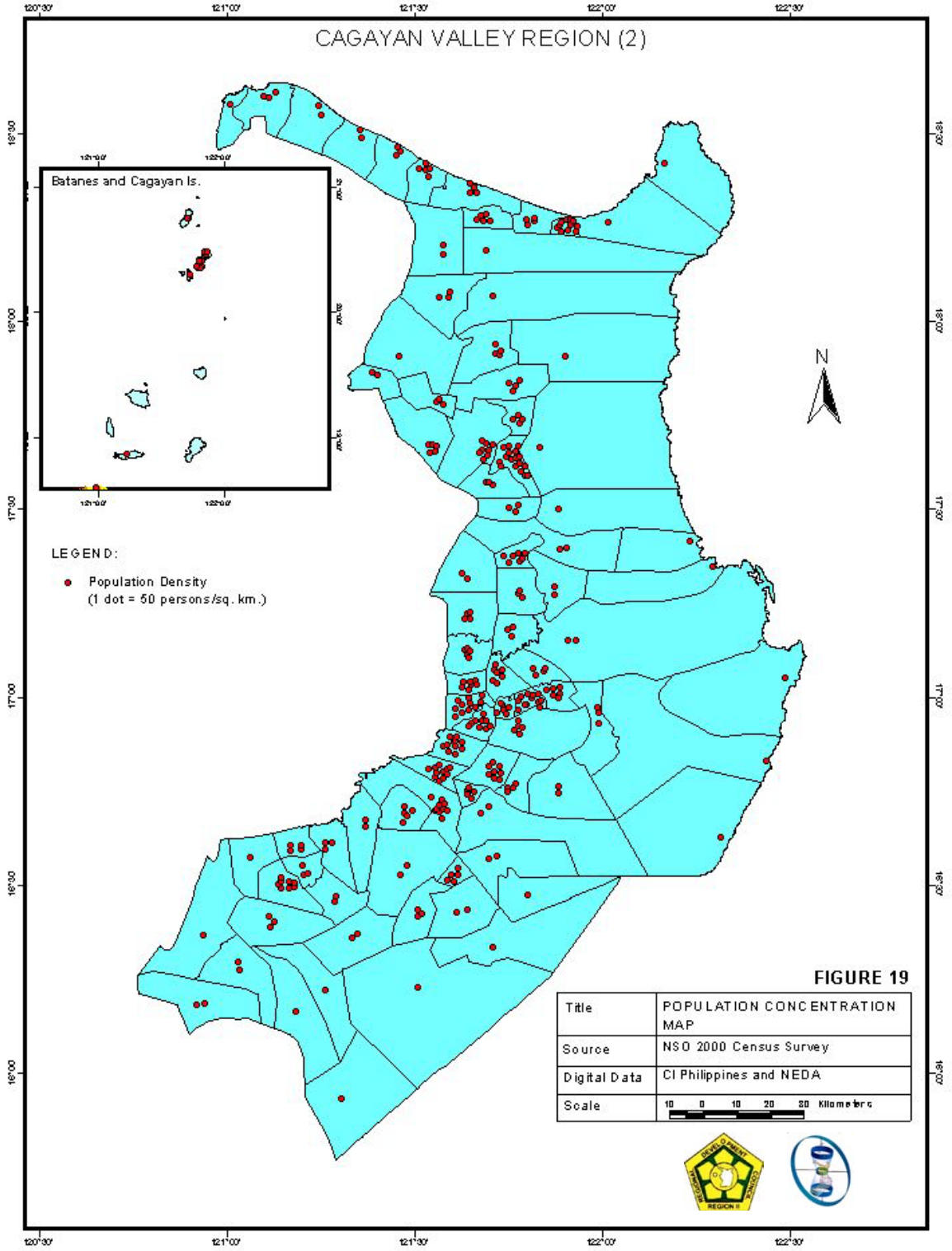


FIGURE 19: POPULATION CONCENTRATION MAP

e.2 Urban-Rural Distribution

Urbanization Level

The region is predominantly rural with about 73 percent of its population living in the countryside as of CY 2000. The most urbanized province is Batanes with about half of its population living in the urban areas, followed by Isabela at 31.99 percent. In terms of the distribution of the regional urban population, about 80 percent are found in the provinces of Isabela and Cagayan. The province of Isabela alone accounts for about 54.39 of the total urban population of the region.

Table 13. Urban - Rural Population, Region: 2 By Province
As of 2000

Region/ Province	Total Population	Urban Population	Rural Population	Urbanization Level (%)	% Share of urban popn. to total urban popn.
Batanes	16,647	8,443	8,204	50.72	1.12
Cagayan	993,580	193,154	800,426	19.44	25.55
Isabela	1,287,575	411,182	876,393	31.93	54.39
Nueva Vizcaya	366,962	106,872	260,090	29.12	14.14
Quirino	148,575	36,299	112,276	24.43	4.80
REGION 2	2,813,159	755,950	2,057,209	26.87	100.00

Source of basic data: National Statistics Office

Tempo of Urbanization

The region's urban population rose sharply in the past 30 years. From a population of 222,334 in 1970 or 15.20 percent of the regional total, urban population grew by about 240 percent to reach 755,950 in 2000 or 26.87 percent of the regional total. In contrast, rural population increased by a mere 66 percent during the same period. Urban population registered the fastest growth during the period 1980 to 1990 with an annual average rate of 5.18 percent. This growth rate has tapered down to an annual average of 2.87 percent from 1990 to 2000. Over the years, urban population growth has always been higher than rural population growth. The region's tempo of urbanization, measured as the difference between the geometric growth rate between urban and rural population growth, was highest from 1980 t0 1990.

Table 14. Tempo of Urbanization, Region 2

Year	Total Population	RURAL			URBAN			Tempo of Urbanization
		Pop'n	Growth Rate (%)	Share to Total Pop. (%)	Pop'n	Growth Rate (%)	Share to Total Popn. (%)	
1970	1,462,72	1,240,38	-	85	222,33	-	15.2	-
1980	1,919,09	1,575,54	2.42	82	343,54	4.45	17.9	2.03
1990	2,340,54	1,771,09	1.18	76	569,45	5.18	24.3	4.00
2000	2,813,159	2,057,209	1.51	73	755,95	2.87	26.8	1.36

Source of basic data: National Statistics Office

UUrban Centers

About 35 percent of the region's population is concentrated in sixteen (16) municipalities with the highest urban population (***Table 15***). About 58 percent of the region's total urban population live in these municipalities. Tuguegarao City has the highest level of urban population and accounts for about 10 percent of the total of these sixteen municipalities. Proliferation of settlements along the national highway and main access roads is also being experienced. This happened as people in rural areas moved towards urban centers for easier access to economic opportunities and basic services.

Table 15. Top 16 Municipalities with the Highest Urban Population
Region 2, As of 2000

Municipality	Urban Population	Total Population
Tuguegarao City	77,962	120645
Santiago City	40,138	110531
Cauayan	40,099	103952
Ilagan	36,214	119990
San Mateo	33,742	55068
Solano	26,799	52931
Roxas	25,304	48920
Bayombong	23,669	50563
Ramon	22,647	41441
San Mariano	20,796	41309
Tumauini	17,708	50256
Cabatuan	17,286	31659
Cabagan	16,843	41536
Bambang	14,431	41393
Mallig	13,220	25918
Alicia	12,603	57178

Source of Basic Data: National Statistics Office

Table 16 shows the region's top 15 municipalities with the highest level of urbanization. The proportion of urban to the total population ranged from 44.44 percent (Sta. Praxedes in Cagayan) to 90.29 (Basco, Batanes). A total of 11 of these areas reached an urbanization level of more than 50 percent. Potentials for urbanization is not limited to the relatively larger population centers. The same table also shows five (5) small municipalities with population level below 7,000 is included among the region's top municipalities with the highest urbanization level. This implies that urbanization is a challenge not only for large population centers to address but also for relatively small municipalities that have started to provide or show potentials for activities such as trade, business, services and other activities aside from agriculture.

Table 16. Top 15 Municipalities with the Highest Urbanization Level
Region 2 As of 2000

Municipality	Total Population	Urbanization Level
Basco	6,717	90.29
Tuguegarao City	120,645	64.62
Uyugan	1,268	61.51
San Mateo	55,068	61.27
Ramon	41,441	54.65
Cabatuan	31,659	54.60
Alfonso Castañeda	4,808	53.06
Roxas	48,920	51.73
Mallig	25,918	51.01
Solano	52,931	50.63
San Mariano	41,309	50.34
Sabtang	1,678	48.33
Bayombong	50,563	46.81
Burgos	20,422	45.89
Sta. Praxedes	2,952	44.44

Source of Basic Data: National Statistics Office

Rural Areas

The region is predominantly rural with about 73 percent of its population or about 2.06 million people living in the countryside. As of CY 2000, the rural population was registered to grow at an average rate of 1.51 percent per annum, lower than the regional total population and urban population growth rates. Among the provinces, Cagayan registered the highest proportion of its population living in the rural areas at about 80 percent and Quirino at 75 percent. There are 61 municipalities in the region with more than 70 percent of their population living in rural areas. These areas represent the rural/agricultural sector, and they serve as the source of the region's food requirements and trade export to other regions of the country. Settlements are widely dispersed and relatively underdeveloped in these rural areas.

e.3 Indigenous Peoples/Cultural Communities (IPs/ICCs)

Republic Act 8371 or the "Indigenous Peoples Rights Act of 1997" defines the country's Indigenous Peoples/Cultural Communities (IPs/ICCs). As of CY 2000, the IP population of was 907,910 or 32.27 percent of the region's total population (***Table 17***). The province of Isabela recorded the highest share of IPs to the region at 37.14 percent followed closely by Cagayan at 35.17 percent. Almost all of the population in Batanes and half of the population in Nueva Vizcaya are considered as IPs. Faced with the issues of socio-economic displacement and threats to the culture of the IPs, the RA 8371 recognizes and mandates respect for IPs rights to their ancestral lands and domains, self-governance, social justice and human rights and cultural integrity. Thus, a total of 362,221 hectares of ancestral lands have

been issued Certificate of Ancestral Domain Claim (CADC) from 1994-1998, the bulk of which are located in the provinces of Quirino and Nueva Vizcaya (***Table 18 and Figure 20***).

Table 17. Total Population of Indigenous Peoples By Province
Region 2, as of CY 2000

Province	Total Population	Total IP Population	Percent Distribution	Percent Share to Provincial Population
Batanes	16,647	15,517	1.71	93.21
Cagayan	993,580	319,338	35.17	32.14
Isabela	1,287,575	337,189	37.14	26.19
Nueva Vizcaya	366,962	182,039	20.05	49.61
Quirino	148,575	53,827	5.93	36.23
REGION 2	2,813,159	907,910	100.00	32.27

Source of Basic Data: National Commission on Indigenous Peoples (NCIP) Region 2

Table 18. Certificate of Ancestral Domain Claims Issued Per Province
Region 2, CY 1994-1998

Province/ CADC No.	Municipality	Date Issued	Area (has.)	Tribe	Population
CAGAYAN			*83,794.36*		
1. R-02-CADC-048	Baggao	June 14, 1996	26,785.8365	Agta	94
2. R-02-CADC-129	Pamplona	June 05,1998	36,345.6962	Agta	210
3. R-02-CADC-133	Gattaran	June 05,1998	20,662.8300	Agta	295
ISABELA			*45,276.6121*		
4. R-02-CADC-061	Palanan/S.	Sept.24,1996	28,376.0000	Agta	111
5. R-02-CADC-181	Mariano	June 03, 1998	3,309.3978	Agta/Dumagat	1,349
6. R-02-CADC-182	Maconacon San Mariano	June 03, 1998	13,591.2143	Agta/Dumagat/ Kalinga	111 1,789
NUEVA VIZCAYA			*113,819.0981*		
7. R-02-CADC-020	Dupax del Norte	Jan.29,1996	17,972.3109	Bugkalot	2,623
8. R-02-CADC-021	Kasibu	Jan. 29, 1996	2,822.3205	Nugkalot	589
9. R-02-CADC-022	Alfonso Castaneda	Jan. 29, 1996	21,842.2025	Bugkalot	1,023
10.R-02-CADC-023	Dupax del Sur	Jan. 29, 1996	31,112.9642	Bugkalot	4,150
11.R-02-CADC-118	Aritao& Sta. Fe	Mar. 19,1998	40,069.3000	Kalanguya/ Ikalahan	5,554
QUIRINO			119,331		
12.R-02-CADC-002	Nagtiounan	June 14, 1994	108.360	Bugkalot	6,185
13.R-02-CADC-053	Maddela & Nagtipunan	June 14,1994	10,971	Agta/ Bugkalot	122 1,120
REGION 2			362,221.0718		25,325

Source: Department of Environment and Natural Resources, Region 2

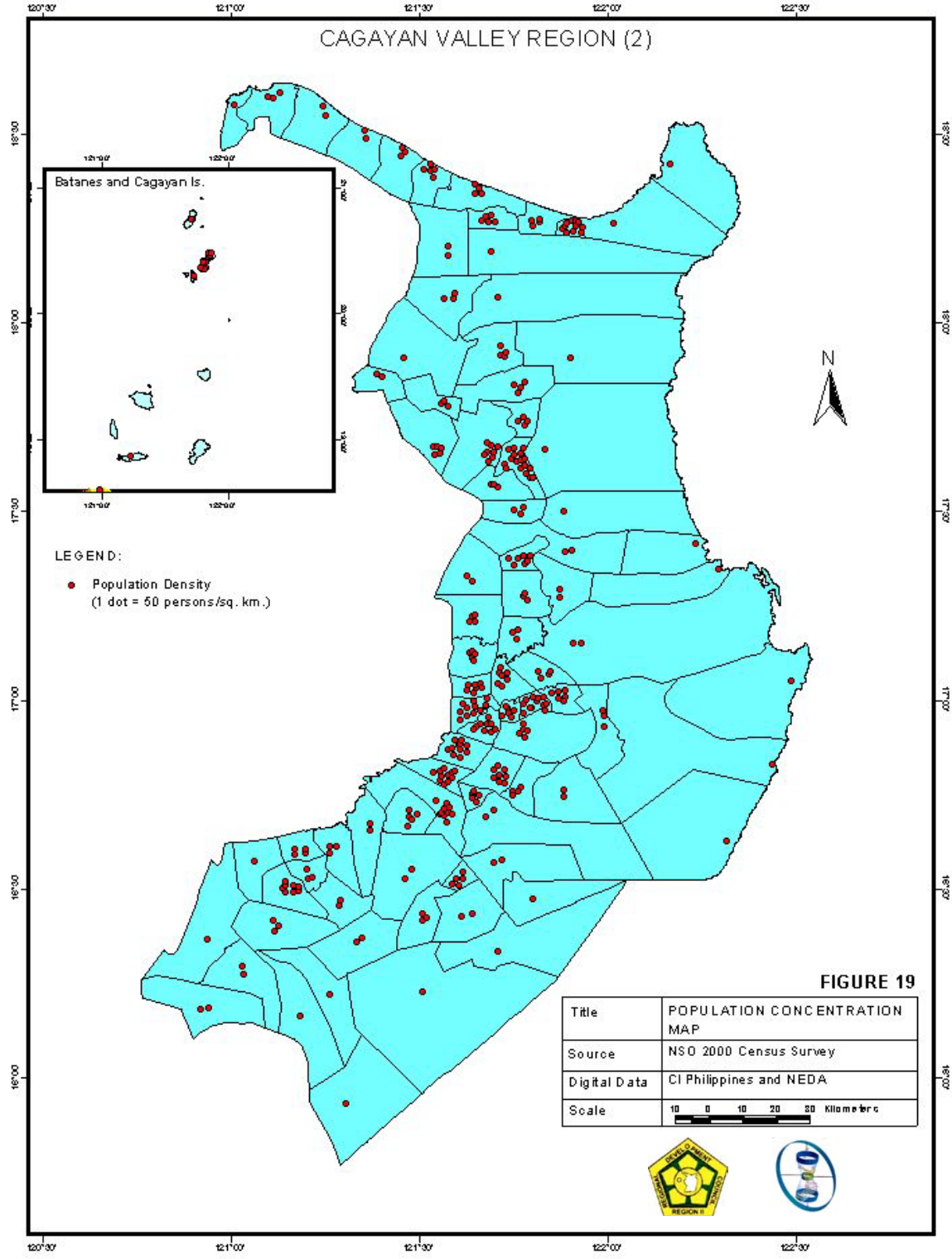


FIGURE 20: CERTIFICATE OF ANCESTRAL DOMAIN CLAIM MAP

e.4 Population Density

Given its vast land area and a relatively small population, Region 02 is one of the least dense regions in the country. Sprawl type of settlements development is prevalent, especially in the rural areas. Its population density in CY 2000 is 103 persons per sq. km., the third lowest among regions in the country. The population density of the National Capital Region (NCR), the country's major urban center, is about 160 times that of the region. On the other hand, the national average density is approximately twice that of the regional average **(*Table 19*)**.

Among the provinces, Isabela has the highest density while Quirino has the lowest with densities of 101 and of 37.29 persons per sq. km. of land area respectively. There are 66 municipalities or about 71 percent of the region's total number having densities less than the national average of 246 persons per sq. km. of land. There are only 26 municipalities or 21 percent that exceed the national average density. The relatively dense areas are those municipalities located in the valley side portion of the region, particularly those located along the Maharlika Highway (***Figure 19***).

Of the region's major population centers, Tuguegarao City is the most dense at 833 persons per sq. km. of its total land area. The rest of the municipalities represent the agricultural sector and settlements are widely dispersed as indicated in their respective densities (***Table 20 and 21 and Figure 21***). Although settlements in the region's major centers are relatively concentrated when compared with other municipalities, these urban centers are still way below the densities of the country's major urban centers as shown in Table 21 below. This implies that the region urban centers have still enough urban space for future expansion requirements.

Table 19. Population Density, Philippines by Region
As of 2000

REGION	DENSITY* (Per/Sq. Km.)
NCR	16,497
III	432
VII	361
I	325
VI	307
V	263
Philippines	*246*
IV	242
IX	196
ARMM	192
XII	171
VIII	168
X	162
XIII	110
II	*103*
CAR	99
XI	96

Source: Phil. Statistical Yearbook
** Prelimnary results of May 2000 Census*

Table 20. Population Density of Cities in Region 2 and other Urban Centers in the Philippines: CY 2000

CITY/MUNICIPALITY	DENSITY (Persons/Sq. Km.)
Tuguegarao City	833
Cauayan City	273
Santiago City	433
Municipality of Ilagan	86
Urban Centers in other Regions	
Metro Manila	15,617
Davao City	947
General Santos	1,024
Cagayan De Oro	1,238

Table 21. Land Area, Population and Density, Region 2
By Province and by Municipality: CY 2000

PROVINCE/ MUNICIPALITY	LAND AREA (Sq. Kms.)	POPULATION (Persons)	DENSITY (Per/Sq. Km.)
REGION II	26,837.60	2,813,159	105
BATANES	209.3	16,647	80
Basco	35.5	6,717	189
Itbayat	92.9	3,616	39
Ivana	11.8	1,293	110
Mahatao	12.9	1,895	147
Sabtang	40.7	1,678	41
Uyugan	15.5	1,268	82
CAGAYAN	9,002.70	993,580	110
Abulug	162.6	26,683	164
Alcala	187.2	33,997	182
Allacapan	306.8	26,960	88
Amulung	242.2	42,754	177
Appari	264.6	59,046	223
Baggao	920.6	66,264	72
Ballesteros	120	27,534	229
Buguey	138.2	26,401	191
Calayan	506.8	14,309	28
Camalaniugan	76.5	21,186	277
Claveria	194.8	29,277	150
Enrile	184.5	29,082	158
Gattaran	707.5	47,804	68
Gonzaga	486.2	32,079	66
Iguig	108.1	21,858	202
Lal-lo	702.8	36,529	52
Lasam	213.7	34,082	159
Pamplona	173.3	20,142	116
Peñablanca	1,193.20	37,872	32
Piat	139.6	20,524	147
Rizal	124.4	14,929	120
Sanchez Mira	198.8	21,745	109
Sta. Ana	441.3	21,612	49
Sta. Praxedes	110	2,952	27
Sta. Teresita	25	13,804	552
Sto. Niño	512.9	22,752	44
Solana	200.8	67,512	336
Tuao	215.5	53,536	248
Tuguegarao City	144.8	120,645	833
ISABELA	10,665.30	1,287,575	121
Alicia	154.1	57,178	371
Angadanan	204.4	36,788	180
Aurora	48.8	28,836	591

PROVINCE/ MUNICIPALITY	LAND AREA (Sq. Kms.)	POPULATION (Persons)	DENSITY (Per/Sq. Km.)
Echague	680.8	61,101	90
Gamu	129.4	25,901	200
Ilagan	1,393.60	119,990	86
Jones	352.9	39,001	111
Luna	45.7	14,581	319
Maconacon	135.4	3,721	27
Magsaysay	189	23,619	125
Mallig	133.4	25,918	194
Naguilian	89.8	26,285	293
Palanan	747.5	15,317	20
Quezon	189.9	20,090	106
Quirino	126.2	19,986	158
Ramon	75	41,441	553
Reina Mercedes	35.4	20,353	575
Roxas	184.8	48,920	265
San Agustin	278.4	19,927	72
San Guillermo	168.1	13,338	79
San Isidro	71.9	18,603	259
San Manuel	76.4	27,059	354
San Mariano	1,469.50	41,309	28
San Mateo	100.2	55,068	550
San Pablo	637.9	19,090	30
Santa Maria	140	20,115	144
Santiago City	255.5	110,531	433
Santo Tomas	60.7	21,380	352
Tumauini	467.3	50,256	108
NUEVA VIZCAYA	3,903.90	366,962	94
Alfonso Castañeda	375.4	4,808	13
Ambaguio	185.6	9,750	53
Aritao	265.6	31,705	119
Bagabag	183.9	30,652	167
Bambang	345	41,393	120
Bayombong	136	50,563	372
Diadi	181.2	14,374	79
Dupax del Norte	347.3	23,196	67
Dupax del Sur	374.7	16,371	44
Kasibu	318.8	28,239	89
Kayapa	482.9	19,193	40
Quezon	176.2	15,986	91
Solano	310	52,931	171
Sta. Fe	139.8	12,949	93
Villa Verde	81.5	15,392	189
QUIRINO	3,057.20	148,575	49
Aglipay	161.7	21,774	135
Cabarroguis	260.2	25,832	99
Diffun	320.1	39,489	123
Maddela	2,259.70	32,236	14
Nagtipunan*		17,027	
Saguday	55.5	12,717	229

Source: Land Area - DENR Region 2

Population - 2000 Census of Population, NSO Region 2

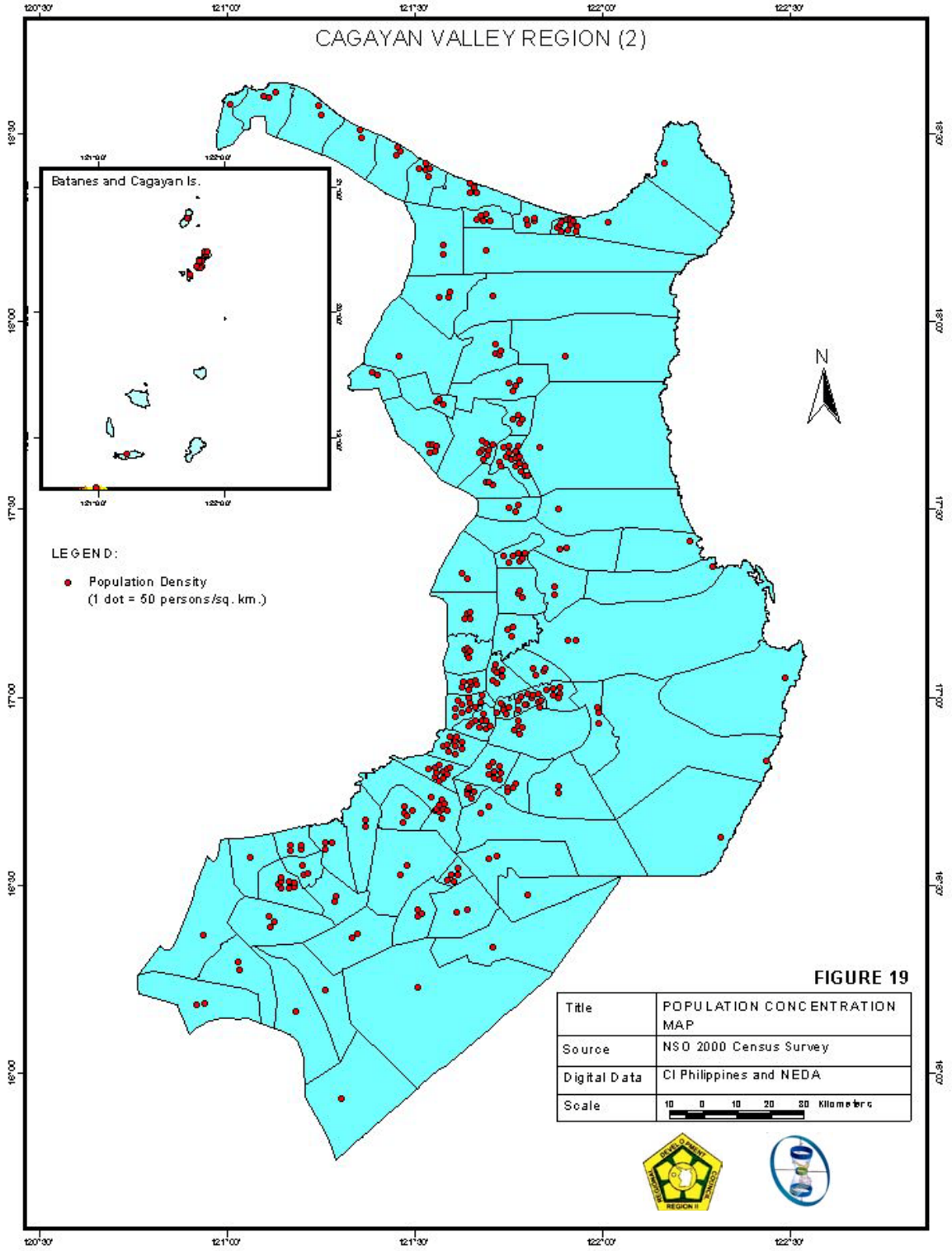


Figure 21: POPULATION DENSITY MAP

e.5 Functional Linkages of Settlements

The three (3) component cities (i.e. Tuguegarao, Cauayan and Santiago) and the Municipality of Ilagan currently function as the region's main population and service centers. Each of these areas hold a population of at least 100,000 persons and their combined population of about 493,000 represents approximately 15 percent of the regional total. These centers provide a relatively diverse range of facilities to cater to the administrative, social, commercial and institutional service requirements of the region's population as shown in the Manual Scalogram Matrix (***Figure 22***). Development in these areas is expected to radiate to peripheral municipalities that are less developed as they continue to attract more population and services. Meanwhile, the municipalities of Aparri, Roxas and San Mateo have lesser population but are becoming centers with well-developed services.

There are also other provincial corridors (e.g. Cabarroguis-Diffun, Solano-Bayombong, Basco) and other municipalities that provide services on a provincial scale or to their surrounding municipalities. They serve as direct links for services that cannot be accessed by smaller towns or production areas through the main service centers. These settlements are characterized by the presence of relatively smaller scale services such as agriculture support, financial services, recreational facilities, primary and secondary health care, and education. The rest of the municipalities serve as the region's agricultural production base. These settlements are the rural areas with population generally below the 50,000 level. They provide the region's requirements for raw materials for industries and food for domestic and external consumption.

e.6 Access to Basic Facilities and Services

e.6.1 Social Services

Health

On a regionwide scale, access to safe drinking water and sanitary toilet facilities significantly improved within the years 1991 and 1998. In terms of water supply, all provinces substantially increased their respective water service coverage and consequently their comparative ranking among all provinces of the country. On sanitary toilet facilities, household coverage went down in the provinces of Quirino and Nueva Vizcaya, making the two provinces with the lowest percentages of households covered in the region. Even with improvements noted from 1991 to 1998, the provision of safe water and sanitary toilet remains a major health concern in the region. This translates to a total of about 145,627 without access to safe water supply and about 97,078 households using unsanitary toilet facilities as of 1998 (***Table 22***).

Tertiary health care is provided by 86 licensed hospitals of which 41 are under government control and 45 are private - owned. Isabela has 45 licensed hospitals i.e. 14 government and 31 private, the highest among provinces in the region. There are three tertiary level hospitals: Cagayan Valley Medical Center (CVMC) in Cagayan, Veterans Regional Hospital in Nueva Vizcaya, and

Cagayan Valley Sanitarium – a private hospital in isabela. There are also 61 licensed clinical laboratories in the region broken down as 35 government and 26 private – owned. Fifity-five (55) of the clinical laboratories are hospital – based and 6 are non- hospital – based. All municipalities are provided with a Rural Health Unit (RHU) to cater to primary health care needs of the regional population.

Table 22. Percentage of Families With Access To/Own Health Facilities/Services, Region 2
By Province, 1990 and 1998

PROVINCE	Families with Access to/Own									
	Health Facilities		Safe Drinking Water				Sanitary Toilet			
	1998		1991		1998		1991		1998	
	%	*Rank	%	*Rank	%	*Rank	%	*Rank	%	*Rank
Batanes	41.1	28	100.0	1	100.0	1	100.0	1	100.0	1
Cagayan	38.6	36	64.8	58	71.7	42	83.8	8	90.0	7
Isabela	48.9	14	80.3	42	91.8	12	69.4	36	86.7	11
N. Vizcaya	29.6	61	71.1	51	82.5	27	77.4	19	77.0	28
Quirino	48.0	16	78.1	45	93.5	10	81.2	13	66.3	45
REGION 02					82.2					

Source: Countryside in Figures, National Statistical Coordination Board Department of Health, Environmental Health Services
*** Position of the province among the 78 provinces of the country*

In terms of manpower resources in the local governments, data reveal the lack of doctors and other health personnel in the region's five provinces when compared to the other provinces of the country. The Province of N. Vizcaya, which posted the highest doctor – population ratio in the region, is in mere 34th place among the 78 provinces of the country. However, it does not enjoy enough of other health personnel as it ranks very low on this respect. For "other health personnel", only Batanes fared comparatively better against the rest of the country registering the 3rd highest population ratio in 1998 **(*Table 23*).**

Table 23. Number of Health Workers in LGU and Population Ratio
By Province, As of CY 1998

PROVINCE	Health Personnel					
	Doctors			*Other Health Personnel		
	Number	Ratio per 100,000 HHs	Rank**	Number	Ratio per 1,000 HHs	Rank**
Batanes	-	-	77	226.0	68	3
Cagayan	28.0	16	58	4620.0	26	36
Isabela	36.0	15	59	3977.0	17	54
N. Vizcaya	15.0	21	34	233.0	3	72
Quirino	4.0	17	50	891.0	38	24

Source: Countryside in Figures, National Statistical Coordination Board
**Other Health Personnel includes dentists, nurses, midwives, nutritionists, sanitary inspectors, medical technologists, active barangay health workers, dental aides, trained birth attendants and non-technical workers*
*** Position of the province among the 78 provinces of the country*

Education

Considered as basic strategies in enabling all of the school-going age population to access basic education is the provision of elementary schools in every barangay and expanding access to secondary education particularly in hard-to-reach areas. As of CY 2000, however, there are still 39 barangays without a primary/elementary school in 22 municipalities. For secondary education, there are still three municipalities without a secondary school, i.e. Alfonso Castañeda and Ambaguio in N. Vizcaya and Divilacan in Isabela **(*Table 24*).**

Table 24. List of Priority School-less Barangays, Region 2
By municipality and province as of CY 2000

PROVINCE	MUNICIPALITY	BARANGAY
BATANES	Basco	Diura
CAGAYAN	Baggao	Masisit
	Sto. Nino	Masical, Palusao and Sidiran
	Ballesteros	Calappawan
	Pamplona	Nagtupacan
	Claveria	San Miguel
	Solana	Bauan West
	Tuguegarao City	Cataggaman Nuevo, Dadda, Linao East, Sitio Lingaling, Pallua Norte and Namabbalan Sur
ISABELA	Cabagan	Casibarag Norte
	Ilagan	Quimmalabasa
	Sto. Tomas	Wawang-Tuliao
	Palanan	Centro West and Dimalicu-lico
	Sta. Maria	Calamagui North
	San Pablo	Guminga
	Benito Soliven	Binogtungan and Dagupan
	San Mariano	Udiao, Daragutan West and Villa Ancheta
	Cabatuan	Paraiso
	Cauayan	Baculod
	Reina Mercedes	Laoaginia
	San Isidro	Ramos West
NUEVA VIZCAYA	Bambang	Cawacao, Homestead and Salicpan
	Bayombong	Luyang and Vista Alegre
QUIRINO	Cabarroguis	Buenavista, Dumabato Norte, Poblacion Sur and Villa Hermoza Sur

Source: DEPED-RO2

Access to education is measured not only through the physical presence of an educational facility but also to the economic condition of person and the community as well. In 1998, about 24,000 families or 7.5 percent of the region's total number have children ages 6-12 years old who are not attending school. For secondary level of education, a greater percentage of families were not able to send their children for high school education at 26.3 percent or 21,000 families. For those enrolled, nearly 8 out of 10 students belonging to the low - income bracket walked to school compared to about 6 out of 10 for the highest 60 percent income bracket **(*Table 25*).**

Most of those not going to school or most of the out-of-school youths were either employed or looking for work, especially those in the highest 60 percent income

group. For the lowest 40 percent income group, major reason for not going to school was lost in interest in schooling, burdened by the high cost of education.

Generally, females were out of school due to housekeeping, particularly those belonging to the lowest 40 percent bracket.

Table 25. Population 6-24 Years Old, Region 2:
By Means of Going to School, Income Strata, As of October 1998

Means of Going to School	Pop'n 6-24 Yrs. Old		Income	
	Number (1,000)	%	Lowest 40%	Highest 60%
CAGAYAN VALLEY	807	100	39.3	60.7
Walking	523	64.8	76.4	57.2
Bus/Car/Jeep	122	15.1	9.1	19.1
Motorcycle/Tricycle	151	18.7	12	23.1
Bicycle/Pedicab	2	0.2	0.4	0.1
Water Transport	0	0.0	0	0
Anima/Animal drawn	8	1.0	2	0.4
Other Means	0.7	0.1	0	0.1

Source:1998 Annual Poverty Indicator Survey, NSO

The number of higher educational institutions (HEIs) increased by 88 percent from 25 (Government – 8; Private – 17) in 1990 to 72 (government – 25; private – 47) as of 2001. Improvements in the quality of education offered locally complemented the significant increase in the number of HEIs within the ten-year period. These HEIs are also strategically spread regionwide, which further broadened access to higher learning services. These developments encouraged students to consider pursuing their tertiary education in the region instead of going to Manila and other established education centers. Thus, regional enrolment in the tertiary level increased by about 120 percent or from 30,185 in SY 1990 – 1991 to 66,448 in SY 2001-2002.

Housing

The region's population gives high preference to privately owned housing units built individually and located in residential lots. About 8 out of 10 of the region's families own the house and lot that they live in and 2 out of the ten families rent/use for free the house and/or lot that they live in. Of the total number of houses, 98.7 percent are single-type housing units and the remaining 1.3 percent is of the apartment type, condominium, or similar types of dwelling units ***(Table 26***). These settlements generally follow a sprawl type of development characterized by houses that are located along major existing roads and highways in urban areas and clusters of settlements that are far apart from each other in the rural areas.

Table 26. Percentage of Families By Tenure of Status,
By Type of Housing Facility, By Income Status

Region 2: October 1998

REGION/ INCOME STATUS	TOTAL NUMBER OF FAMILIES REPORTING (000)	TENURE OF STATUS (%)		TYPE OF HOUSING (%)	
		Own or Possession	*Others	Single	**Others
REGION	596	81.9	18.1	98.7	1.3
Lowest	289	80.2	19.8	99.4	0.6
Highest	307	83.5	16.5	98.1	1.9

Source:1998 Annual Poverty Indicator Survey, NSO

* includes those who rent house and/or lot

** includes duplex, apartment/condo, commercial, and other housing units

e.6.2 Economic Support Facilities and Services

Support Facilities

The economic support facilities (i.e. public market, slaughter house, and bus terminal)are listed in Figure 22. The Manual Scalogram of Region 02 Cities and Municipalities provide an indication of the degree of economic activity in a given settlement area. The absence of all or one of these facilities would mean that an area's population level and/or the magnitude of flow of goods and services are not sufficient to support the establishment of said facilities within the locality. There are still 11 municipalities in the region without a public market, 27 without a slaughterhouse and 59 without a bus terminal. There are nine municipalities that have neither of the listed support facilities, six of which are in the Province of Batanes and three in Isabela. The population level of the nine municipalities range from 1,200 to 22,000.

Business Establishments

The diversity of existing business activities show the complexity of an area's economic activity. The most common establishment operating at the municipal level are cooperatives with 95 percent or 88 out of the 93 cities/municipalities having at least one in their area. The five municipalities that do not have a single cooperative are found in three coastal towns of Isabela and two upland areas N. Vizcaya. Banking Institutions follows as the most common establishment after cooperatives, but these are found only in 52 municipalities for a regional average of 56 percent.

Only the three cities indicated the presence of all of the business establishments (i.e. banking institution, bar/nightclub, resort, video center, hotel/restaurant, fastfood chain, movie house and mall/supermarket) listed in the manual scalogram **(*Figure 22*).** In contrast, there are 36 municipalities or 39 percent of the regional total that do not have any of these establishments. An additional 12 municipalities have just one of the business establishments listed in the preceding sentence. Population level appears to be directly proportional to location of a business establishment in an area. About 80 percent or 47 out of the 59 municipalities having population of less than 30,000 either have just one type of business establishment or none at all as previously discussed.

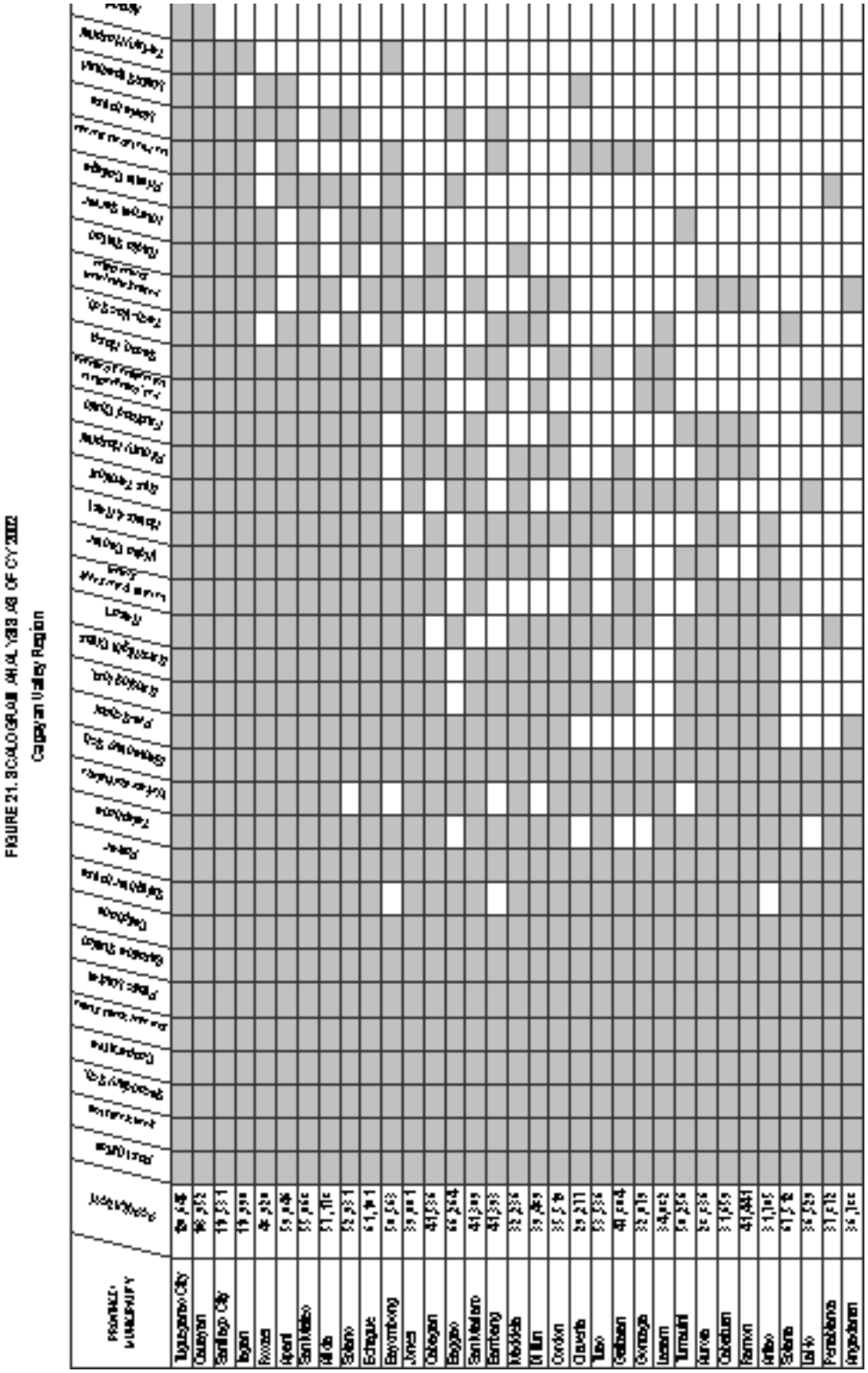
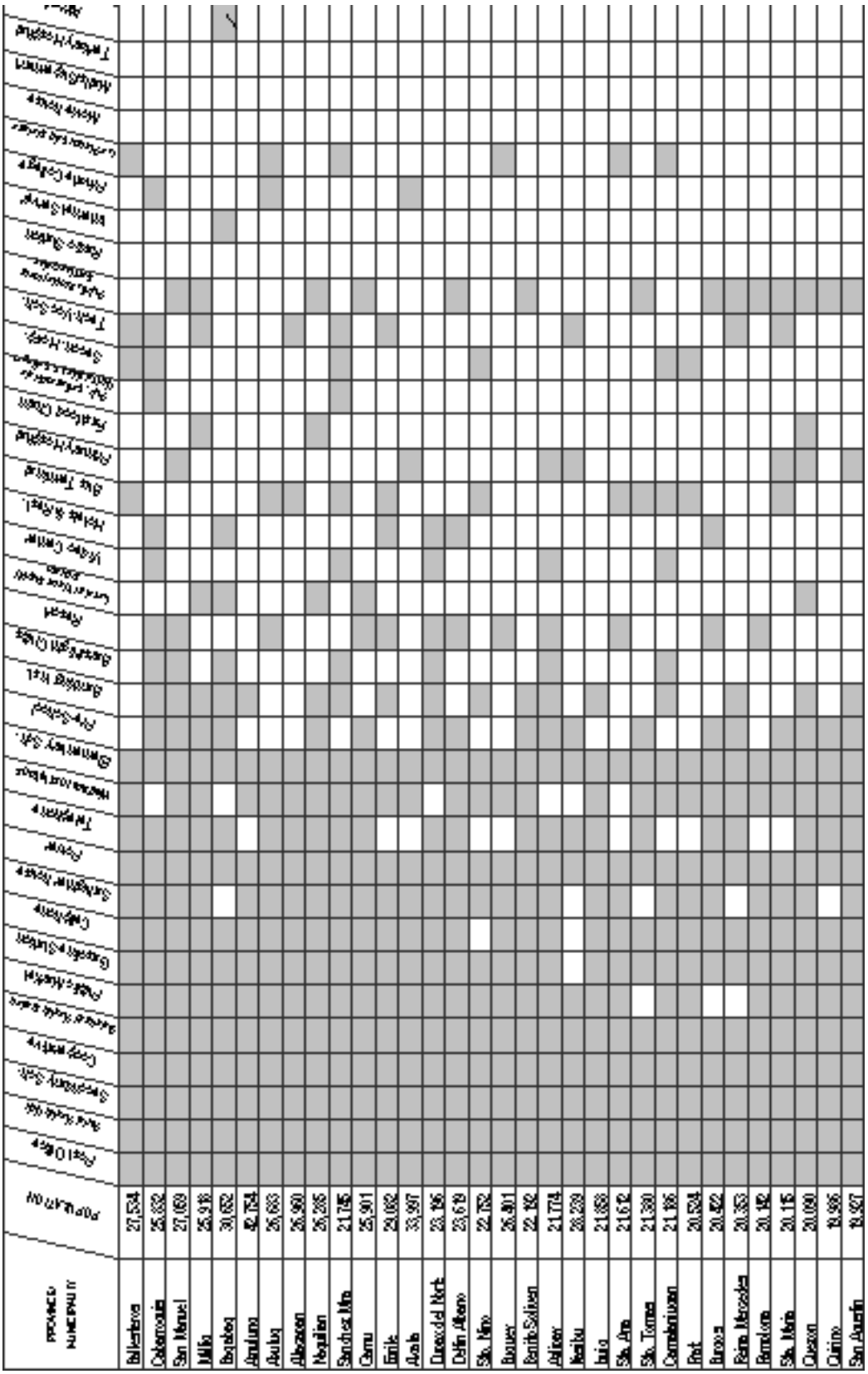


FIGURE 21. SCHOOLGOING AGE YEARS AS OF CY 2002
Cagayan Valley Region



Basic Infrastructure

Among the infrastructure facilities listed in the manual scalogram **(*Figure 22*),** post offices are relatively the most accessible with 100 percent of the region's municipalities having one in their area. Cellphone, telephone and internet services provide communication support for personal and business activities, but ten of the region's municipalities still have to benefit from either a cellphone or telephone service and internet access is limited to the region's three cities and nine municipalities. For household energization, there are 56 cities/municipalities with all their respective barangays energized while the remaining 27 municipalities have some of its barangays not yet energized. Energization data from the National Electrification Administration support the need to further increase access to electricity. About 438 barangays regionwide are still not energized and about 158,000 families representing about 31 percent of the regional total do not have electricity at home.

On the other hand the three cities and fourteen of the ninety municipalities (sixteen percent) in the region have operational Level III water system (***Figure 23***).

e.7 Population Projections

The population projection for the region is shown in Table 27. By Year 2030, the region may reach a total population of 3,984,368 or an increase of 57 percent from its level in 1995. Given the region's lower population growth compared with that of the national average, its share to the national population may further decrease to 3.57 percent in 2030 from 5.17 percent in 1995. In terms of provincial distribution, population may remain concentrated in the provinces of Cagayan and Isabela, although the aggregate share of the said provinces is expected slightly to decrease from 80.72 percent in 2000 to 79.70 percent of the total population in 2030. On the other hand, the provinces of Nueva Vizcaya and Quirino, with their relatively rapid population growth rates during the past 25 years may slightly increase their share to the regional population by 2030.

Table 27. Population Projections, Philippines and Region 2 by Province: 2010 - 2030

REGION PROVINCE	Projected					% share			
	1995	2000	2010	2020*	2030*	1995	2000	2010	2030
REGION	2,536,03	2,923,52	3,338,17	3,764,04	3,984,36	100.00	100.00	100.00	*100.00*
Batanes	14,180	15,482	16,995	18,730	20,015	0.56	0.53	0.51	0.50
Cagayan	895,05	1,010,26	1,133,87	1,263,49	1,337,83	35.29	34.56	33.97	33.57
Isabela	1,160,72	1,349,70	1,546,11	1,736,33	1,814,63	45.77	46.17	46.32	46.13
Nueva Vizcaya	334,96	389,69	451,16	519,12	561,80	13.21	13.33	13.52	13.79
Quirino	131,11	158,37	190,02	226,36	250,07	5.17	5.42	5.69	6.01
PHILIPPINES	68,349,45	79,476,24	91,851,26	105,503,14	111,841,62				
Share of Reg.2 To National Total						3.71	3.68	3.63	3.57

Source : 1995 Census Based City/Municipal Projections

** derived by the RLUC TWG adopting the growth trends reflected in the 1995 Census Based*

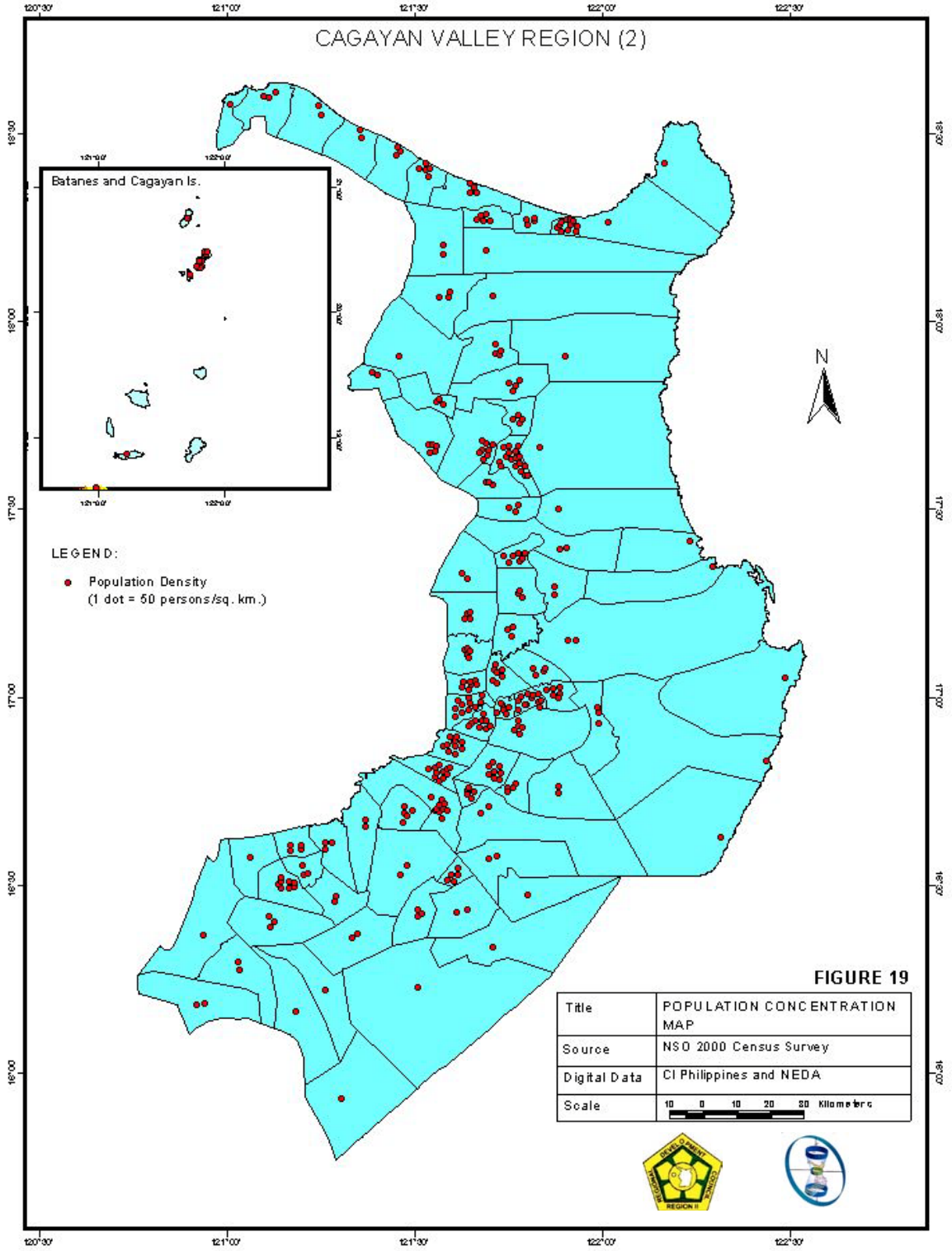


FIGURE 23: LEVEL III WATER SUPPLY SYSTEM

F. LAND USE

The succeeding discussions analyzes the existing situation of the different land use activities in the region with respect to the two major categories of land use, namely: protection land use and production land use.

f.1 Protection Land Use

The sustainability of life support systems or ecosystems has been the focus of current efforts to ensure that the development, management and rehabilitation of these ecosystems are in harmony with the socio-economic, technological and political goals of society. The emphasis on such efforts underscores the gravity of the environmental situation, which threatens the well-being of the present and future generations.

Protection land use covers land uses and physical resources that need to be protected, conserved or rehabilitated, including areas that require the prevention or mitigation of disasters.

The protection efforts are mostly on the total protection forests, which make up 815,905 hectares or 30.40 percent of the region's total land area. These are further categorized as those proclaimed under the National Integrated Protected Area System such as strict nature reserve, natural parks, natural monuments, wildlife sanctuary, protected landscapes and seascapes, resource reserve and natural biotic areas. On the otherhand, the non-NIPAS areas cover the civil and military reservations, wetland areas, other biodiversity-rich areas, second growth forest, buffer strips/public easements, flood prone areas and physically constrained areas. These areas were designated as protected areas through Presidential Proclamations and/or Congressional actions and in accordance with existing national policies**.**

Permanent crops cover an area of 75,324 hectares. Permanent crops refer to perennial crops mostly fruit trees like coconuts, mangoes and citrus, and annual crops like banana and sugarcane. Temporary crops on the other hand, refer to rootcrops, tubers and vegetables, which are subject to crop rotation with rice or corn. The area planted to temporary crops is 43,931 hectares ***(Table 34).*** The potential areas for expansion of high-value commercial crops are the existing prime agricultural lands presently devoted to rice and corn and idle grasslands and brushlands.

The Philippines now has 120,000 hectares of mangrove forests, which is only 26 percent of what we had in the early 1900s. Region 02 has a share of 12,170 hectares of mangroves and swamplands found in the provinces of Cagayan and Isabela. Mangroves serve as nursery for fish and other marine life and help trap or absorb pollution. These bodies of water are important in maintaining ecological balance and serve as communal fisheries resource for the fisherfolk.

The region's protected coastal zones cover a total area of 7,415 hectares with Palaui Island Marine Reserve in Sta Ana, Cagayan.. The area contains 170 hectares of mangroves, 15 hectares of coral reefs, 300 hectares of sea grass beds, and 1,105 hectares of forestlands.

The declaration of the NIPAS and Non-NIPAS areas is to ensure clearly defined and identified areas that are subject for protection. However, there is a continuing challenge on land use due to incomplete ground delineation between the A&D and forest areas (***Table 28 and Figure 24***). As a result, continuing encroachment was observed, threatening further infringement into the confines of designated protected areas. The present situation provides less restriction on resource extractions, or economic activities within or proximate to the forest area. The insufficient technical description of the physical delineation between A&D and forest areas contributes to the ineffective implementation of laws and policies on forest conservation and management, land use conversion and optimum utilization of potential production areas. In the absence of a clear delineation, control mechanisms including enforcement of environmental laws are utterly useless and can be further aggravated by unabated economic activities within the forest protected area.

As of 1998, the coverage area subject to forest protection and monitoring was recorded at 1,191,557 hectares. The area includes protection forests, production forests and watershed areas (***Figure 25***). Considering the wide expanse of the area to be monitored, the region lacks the necessary manpower, facilities and equipments to effectively address the problem of illegal logging, timber poaching and illegal settlements within the forest area. This situation of the region is verified through monitoring reports of continuous transportation of illegally cut lumber especially in the provinces of Isabela, Cagayan and Quirino. Established checkpoints in the region's major entry and exit points are not sufficient counter measures to prevent illegal logging operations. Aside from the limited number of environmental law enforcers, they also lack the required trainings and capability enhancement programs to develop these personnel into effective instruments in curbing forest-related illegal activities. Task forces and environmental brigades were also established at the local level but the lack of incentives, unclear function and limited understanding on their role barely address forest protection-related problems.

The eastern side of the Northern Sierra Madre facing the Pacific is at risk of gradual destruction in view of the limited manpower to safeguard the whole stretch. While coordination with concerned agencies including the LGUs for on-site or field monitoring activities were conducted regularly, these are not enough to mitigate the surreptitious illegal logging conducted in the area.

Table 28. Status of Land Classification, Region 2 by Province: As of 1999

LAND USE	BATANES	CAGAYAN	ISABELA	N. VIZCAYA	QUIRINO	TOTAL
A. FOREST AREA						
A.1 Protected Areas	13,130	235,372	360,752	148,318	160,160	917,732
A.1.1. Protection Forest	12,041	234,822	358,027	67,508	143,507	815,905
a. Old Growth	3,524	134,282	196,735	9,788	35,600	379,929
b. Second Growth	7,217	48,356	117,406	32,521	102,507	308,007
c. Mossy Forest	1,300		42,006	15,560	5,400	64,266
d. Mangrove Forest		7,043	1,061	200		8,304
e. Pine Forest				1,400		1,400
f. Parks		15,344	819	8,039		24,202
g. Natural Growth		29,797				29,797
h. Others						-
A.1.2. Extensive Land Use	1,089	550	2,725	80,810	16,653	101,827
a. Grass/Brushland	639	550	2,500	80,810	16,491	100,990
b. Plantation	450		225		162	837
A.2 Production Areas		269,947	209,737	146,631	94,708	721,023
A.2.1. Production Forest		182,725	63,353	71,360	21,339	338,777
a. Second Growth		153,105	56,488	60,795	17,413	287,801
b. Plantation		29,620	6,865	10,565	3,926	50,976
A.2.2. Extensive Land Use		87,222	126,216	75,271	57,673	346,382
a. Rangeland		72,626	106,120	74,771	55,421	308,938
b. Grazingland		14,596	20,096	500	2,252	37,444
A.2.3. Intensive Land Use		20,168			15,696	35,864
a. Farm Forest (ISF)		4,034			3,212	7,246
b. Crop Land (ISF)		16,134			12,484	28,618
B. RESERVATION		10,163	9,330	4,295		23,788
B.1 Military		9,633	410			10,043
B.2 Civil		530	8,920	4,295		13,745
C. A & D	7,852	384,788	486,637	91,146	50,852	1,021,275
D. UNCLASSIFIED	178					178
Total	*21,160*	*900,270*	*1,066,456*	*390,390*	*305,720*	*2,683,996*

Source: DENR/PENR Offices of Region 2

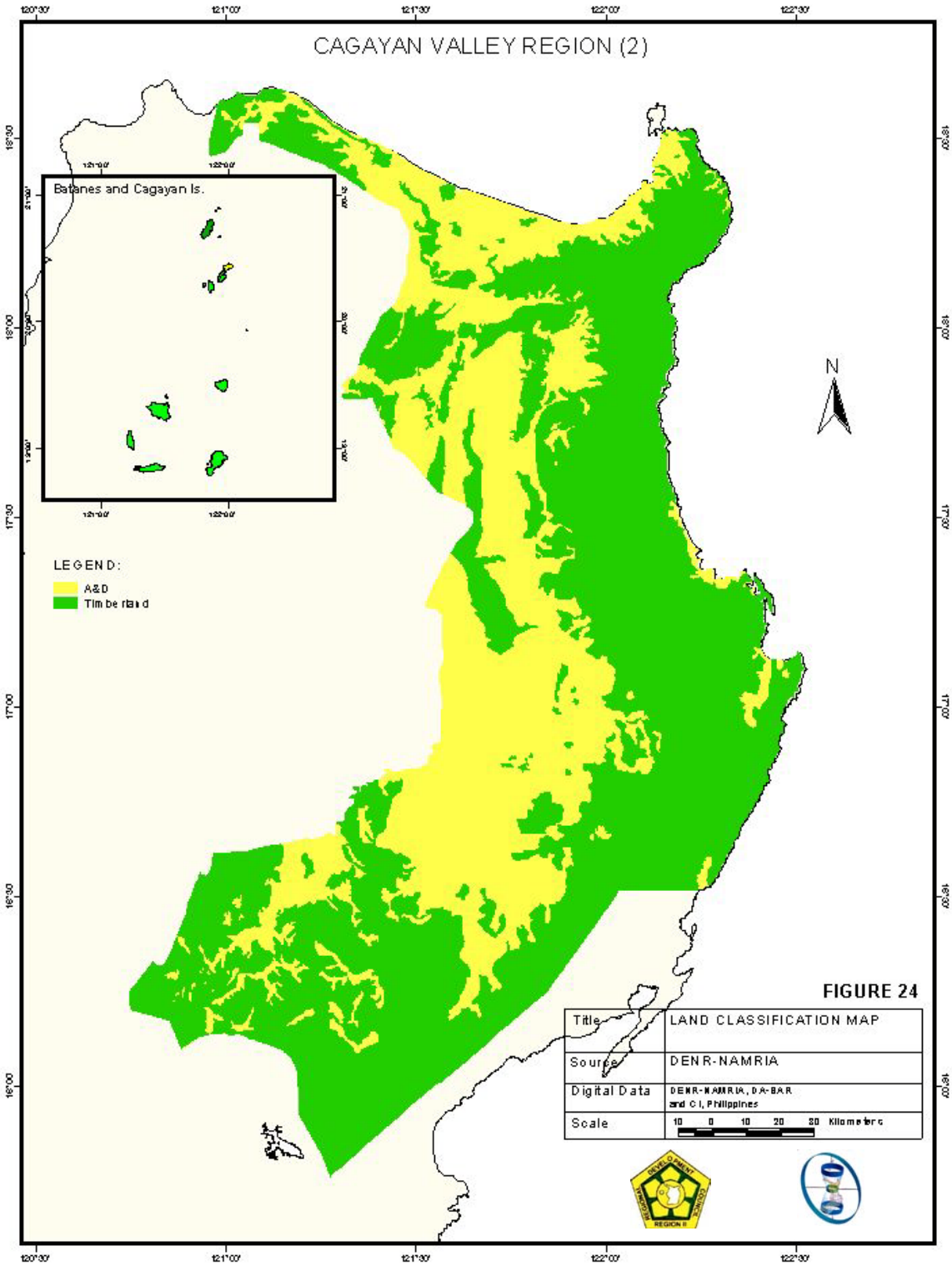


FIGURE 24: LAND CLASSIFICATION MAP

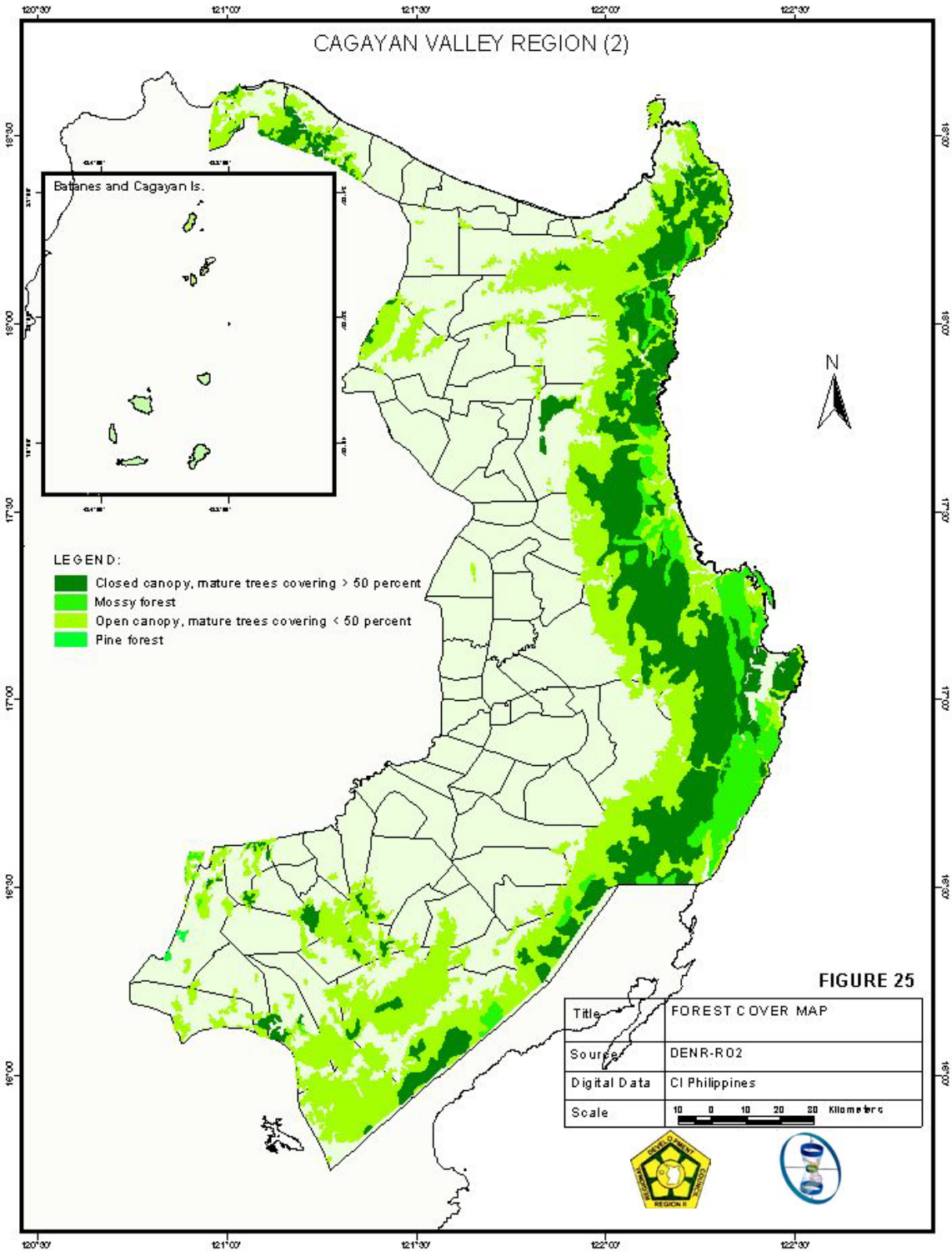


FIGURE 25: FOREST COVER MAP

f.1.1 NIPAS Areas

National Integrated Protected Area System (NIPAS) areas are those harboring unique ecosystems and biological features and proclaimed for maintenance and protection pursuant to Republic Act No. 7586 known as the NIPAS Act of 1992. The NIPAS areas encompass those of low elevation, which are the coastal and/or marine areas, and up to the highest elevation which is dominated by mossy forest.

There are 15 proclaimed Protected Areas within the region. Of these, four were proclaimed as National parks, five are Protected Landscape and Seascape; four are Watershed Forest Reserves, one National Monument, and one Wilderness Area. The total combined area of these proclaimed Protected areas is 874,445 hectares covering both terrestrial and marine ecosystems. The proclaimed protected areas with their corresponding area, location and date of proclamation are reflected in Table 29 and Figures 26.

Region 2 hosts two (2) of the ten (10) priority sites in the Philippines declared under the National Integrated Protected Areas System or NIPAS. The Northern Sierra Madre Natural Park (NSMNP) is the most important and largest Protected Area not only in the region but also in the country. The NSMNP is located in the eastern part of Isabela and occupying the mid-section segment of the Sierra Madre mountain range. It covers an area of 292,842 hectares of land and 67,875 hectares of marine resources. It encompasses mossy forests, old growth forests, residual forests, mangrove areas and coral reefs. The Park still maintains a total of 182,961[1] hectares of lowland evergreen rainforest, the most species-rich forest formation. The other priority NIPAS area is the Batanes Protected Landscape and Seascapes covering the whole province of Batanes to include its marine areas. The Department of Environment and Natural Resources together with international and local institutions and civil society groups are working together with the local stakeholders to develop the Protected Area Management Plans of these protected areas. The management plan is the blueprint of the different interventions for a sustainable management and protection of these protected areas.

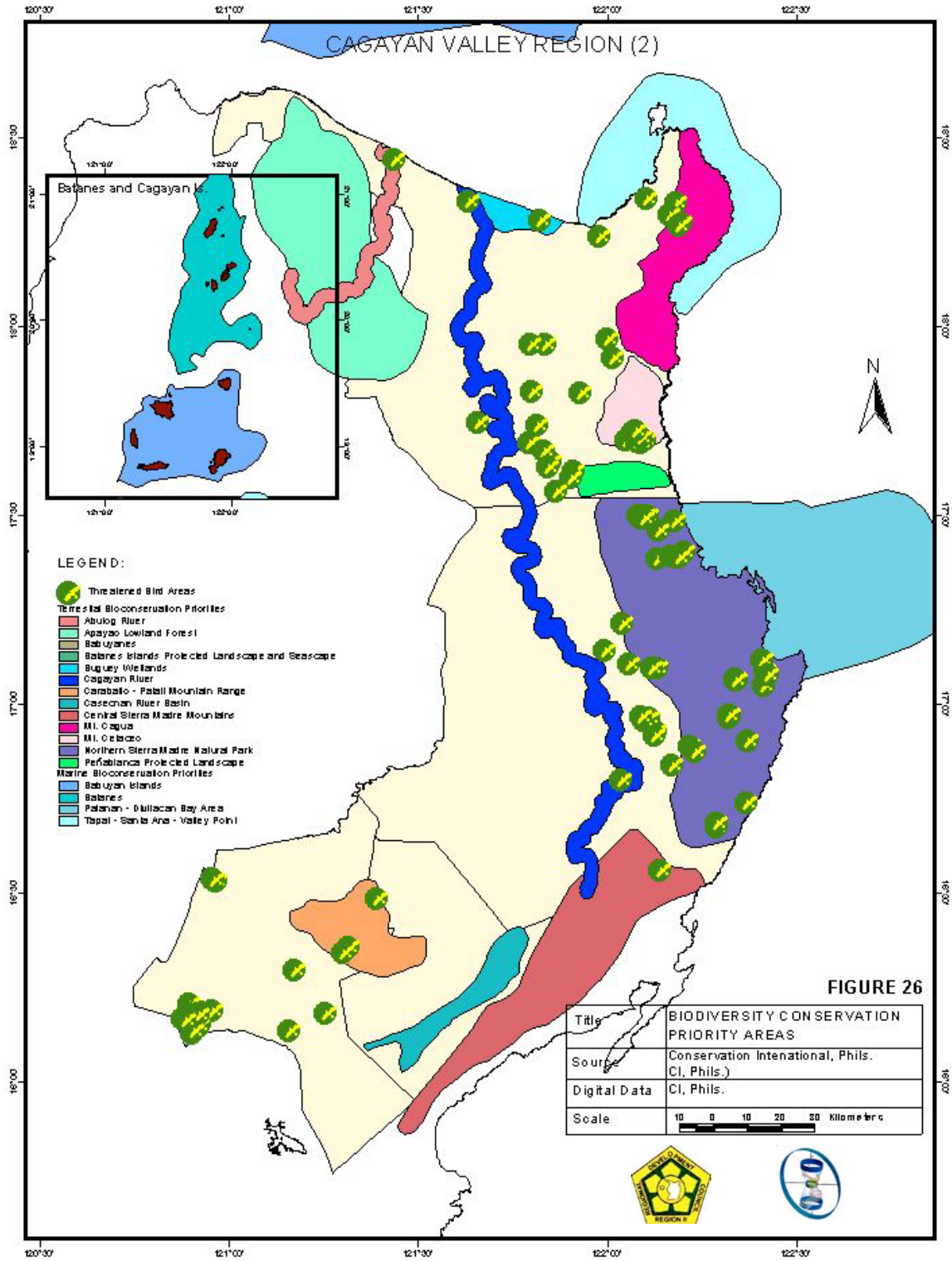


FIGURE 26: BIOVERSITY CONSERVATION MAP

Table 29. List of Proclaimed Protected Areas, Region 2

PROTECTED AREA	LEGAL BASIS/ DATE	AREA (Has)		TOTAL AREA (Has)
		WATER	LAND	
Batanes				
- Batanes Protected Landscape and Seascape	RA 899 Jan. 5, 2001	190,345	23,233	213,578
Cagayan				
- Palaui Island Protected Landscape and Seascape	Pres. Proc. 447 Aug. 16, 1994	4,415.48	3,000.00	7,415.48
- Magapit Protected Landscape	Pres. Proc. 285 April 23, 2000		3,403.62	3,403.62
- Peñablanca Protected Land-scape and Seascape	Pres. Proc. 484 Oct. 6, 2003	15,563	103,218.58	118,781.58
- Wangag Watershed Forest Reserve	Pres. Proc. 107 May 18, 1987		6,992	6,992
- Baua Watershed Forest Reserve	Pres. Proc. 108 May 18, 1987		8,955	8,955
Isabela				
- Northern Sierra Madre Natural Park	RA 9125 April 24, 2001	71,625	287,861	359,486
- Foyut Spring National Park	Pres. Proc. 327 Oct. 8, 1984		819	819
- Tumauini Watershed Forest Reserve	Pres. Proc. 355 April 10, 1984		17,670	17,670
- Monte Alto Wilderness Area (Parcel I and II)	Pres. Proc. 120 June 19, 1987		1,095	1,095
Nueva Vizcaya				
- Bangan Hill National Park	RA 7964 March 29, 1995		13.01	13.01
- Salinas Natural Monument	Pres. Proc. 275 April 23, 2000		6,675.58	6,675.58
- Casecnan Protected Land-scape (portion)	Pres. Proc. 289 April 23, 2000		68,.362	68362
- Mt. Pulag National Park	Pres. Proc. 75 Feb. 20, 1987		2,462	2,462
- Dupax Watershed Forest Reserve	Pres. Proc 720 Aug. 8, 1984		424.80	424.80

PROTECTED AREA	LEGAL BASIS/ DATE	AREA (Has)		TOTAL AREA (Has)
		WATER	LAND	
Quirino				
- Casecnan Protected Landscape (Aurora, Quezon, CPL Portion)	Pres. Proc. 289 April 23, 2000		16,475	16,475
- Quirino Protected Landscape	Pres. Proc. 548 Feb. 9, 2004		4,009.8	4,009.8

Source: DENR, Region 2

f.1.2 Biodiversity Conservation Priorities

The results of the Philippine Biodiversity Conservation Priority-Setting Program (PBCPP) represent the national consensus of the country's foremost biological and social scientists. The assessment identified 206 integrated priority areas for biodiversity conservation in the country both in the marine and terrestrial ecosystems. The conservation priority areas were identified based on the analyses of major taxonomic group (plants, arthropods, amphibians and reptiles, birds, mammals) data that overlay to the socio-economic data. There are six (6) terrestrial priority conservation sites for terrestrial ecosystem and seven (7) priority conservation sites for marine ecosystem as shown in Table 30 and Figure 26.

The remaining intact ecosystems in the Region if protected and conserved will provide the needed ecosystem services to sustain the development of the region. The region's sustainable development is dependent on the ecological services provided by these priority conservation areas. Relatedly, the Sierra Madre Biodiversity Corridor was adopted as the interconnection of the protected areas in the eastern side of the region and extended towards the Quezon and Aurora Provinces in Region 3. The Corridor is the subject of sustainable management of the resources through joint Government-NGO collaborations.

There are only few biodiversity rich areas left due to relentless encroachment into the region's forestland and coral reefs. Proof of low biodiversity density in the region is the observed decline in the number of endemic species of plants and animals, some of which are now classified as endangered or extinct. Biodiversity rich areas can only now be found in the remaining forests and the coral reef areas. The continuing encroachment, if not addressed immediately, can result into biodiversity spasm in the near future. The lack of awareness on the importance of these areas leads to an irreversible environmental impact.

Table 30. List of Priority Conservation Areas, Region 2

PRIORITY CONSERVATION SITE	LOCATION
A. TERRESTRIAL ECOSYSTEM	
1. Mt. Cagua	- Gonzaga, Cagayan
2. Mt.Cetaceo	- Baggao and Peñablanca in Cagayan
3. Peñablanca Protected Landscape	- Peñablanca, Cagayan
4. Northern Sierra Madre Natural Park	- Province of Isabela
5. Central Sierra Madre	- Eastern portion of Quirino and Northern portion of Aurora
6. Caraballo-Palali Mountain Range	- Nueva Vizcaya and Quirino Province
B. MARINE ECOSYSTEM	
1. Casecnan River Basin	- N. Vizcaya and Quirino
2. Cagayan River	- Regionwide
3. Buguey Wetlands	- Buguey,Cagayan
4. Abulug River	- Abulug, Cagayan
5. Tapal-Sta. Ana Valley Point	- Sta. Ana, Cagayan
6. Babuyan Island Marine Areas	- Province of Cagayan
7. Batanes Island Protected Landscape and Seascape	- Province of Batanes

Source: DENR, R2

For coastal areas alone, which houses some of the coral reefs and home to endemic and threatened species of marine life, pollution dump into the sea, unregulated tourism and unsustainable fishing practices are the likely culprit to its destruction. The eastern Pacific coast, which stretches from Sta. Ana to Dinapigue, thrives with coral reefs but threatened by encroachment and poaching.

The principal cause of forest destruction and the resulting loss of biodiversity within protected areas are the continued expansion of slash-and-burn and small-scale legal and illegal logging activities. It disturbs the natural habitat of various endemic flora and fauna and the natural ecosystem that was established for centuries. Kaingin as an aftermath of illegal logging also contributed to the deterioration of biodiversity functions and the continued spread of non-productive grassland, fragmentation of habitats and decline in the population of animals and plants that are important for conservation and local use. Destruction of flora, fauna, and reduction of species diversity as well as destruction/modification of wildlife habitat areas through insensitive/uncontrolled development of tourism facilities, overuse of sensitive areas and inappropriate activities lead to the destruction of life support systems.

f.1.3 Watershed Management

The watershed reserves were identified and established to support the region's water needs. These watershed reserves were established to provide the ecosystem services needed to support the development initiatives in the region.

The region's primary watershed areas (***Figure 27)*** remain vulnerable target to human intrusion and exploitation. For the past thirty years, the population of upland communities has increased remarkably. The increasing population and the absence of economic opportunities in the lowland encouraged migration into the upland, mostly in watershed areas where soil is fertile and raw materials are abundant. The search for land to till in order to address basic household needs prompted this movement in the upland areas. The upland areas provided for the land requirement of migrants having no restrictions on ownership. The volume of available resources overwhelmed new migrants, hence, were not conscious about conservation or protection. Extraction activities were far from sustainable and subsequently, they experienced resources depletion within their defined territories. Thus, economic activities were diversified to respond temporarily to their needs. They introduced slash and burn or swidden farming, timber poaching, and even mining. These activities contributed to the reduction in the area and the denudation of watersheds.

Timber extraction was left unabated until the early 90's when logging was declared illegal. Much of what remains of the region's forest are areas that were not accessible to or opening logging roads are not cost efficient. The eastern flank of the Sierra Madre remains relatively untouched due to accessibility problems. The insurgency in the 70's to mid 80's also discouraged small-scale logging operations in the heart of the Sierra Madre. However, illegal logging still persist to present inspite of the policies and regulations to address this concern. Timber poaching along the coastal towns of the region from Sta. Ana, Cagayan to Dinapigue, Isabela even within the Northern Sierra Madre Natural Park is a continuing lucrative trade for few interest groups. Though commercial logging was already minimized, the continuous destruction of the forest remains uncontrolled. Logging is still a major source of livelihood in the absence of better economic alternatives in the low land areas.

On the other hand, most forest fires that occurred in the region were used by slash and burn farming particularly those newly opened areas within the secondary forest. Previously logged-over areas are the most frequently targeted areas for slash and burn since this requires lesser effort for clearing and cultivation. It was observed that most incidents of forest fires are triggered by kaingeros who find the method the easiest way to prepare the area for planting. Grassland fires, whether deliberate or unintentional, also contributed to some forest fires. Forest fires are usually experienced during dry months. Considered fire-prone areas are the municipalities of Gattaran and Baggao in Cagayan, San Mariano in Isabela and Nagtipunan in Quirino.

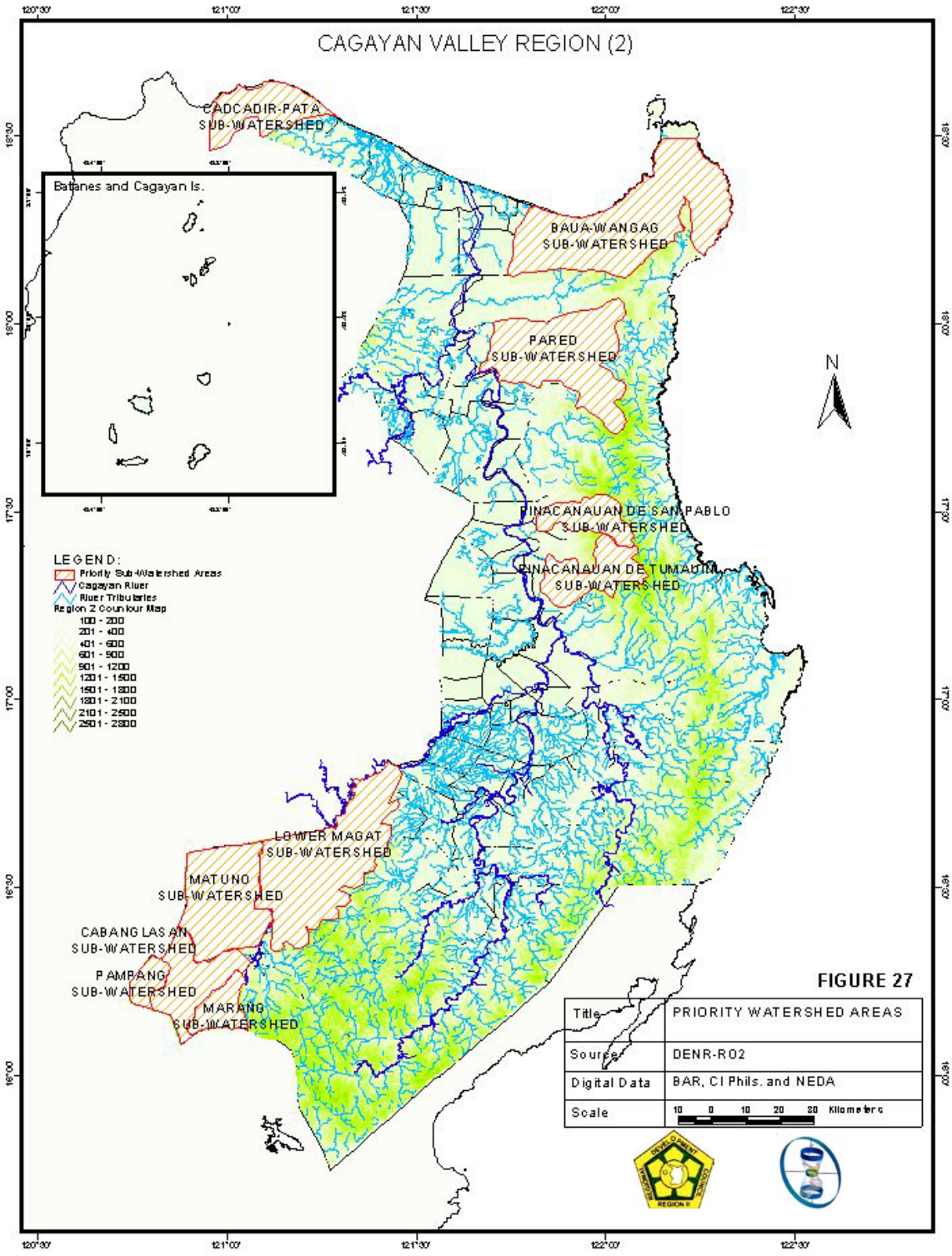


FIGURE 27: PRIORITY WATERSHED AREAS MAP

To maintain the ecological functions of these areas, ten watershed development projects were initiated by the government through out the region aside from the regular rehabilitation activities initiated by the Department of Environment and Natural Resources in critical watersheds particularly in the province of Quirino and Nueva Vizcaya. These projects are enumerated in Table 31. These projects covering a total area of 55,453 hectares are co-managed by the communities living within and in the buffer zones. The area coverage includes forest areas and alienable and disposable lands.

Table 31. Watershed Projects, Region 2
As of June 2002 (In hectares)

Name of Project	A&D Lands	Forest Lands	Total
1. Itbayat Watershed Project	-	278	278
2. Lipatan Watershed Rehabilitation Project	336	514	850
3. Zinundungan Watershed Rehabilitation Project	725	12,275	13,000
4. Diadi River Sub-Watershed Rehabilitation Project	-	1,400	1,400
5. Dicamay River Sub-Watershed Rehabilitation Project	-	4,194	4,194
6. Upper Casecnan Watershed Rehabilitation Project	1,250	17018	18,268
7. Kasibu River Watershed Rehabilitation Project	3,025	8,208	11,233
8. Kirang Macro Watershed Rehabilitation Project	675	1,925	2,600
9. Tungcab Sub-Watershed Rehabilitation Project	-	2,800	2,800
10. Tangliao Sub-Watershed Rehabilitation Project	-	830	830
TOTAL	6,011	49,442	55,453

Source: DENR-R2

f.1.4. Non-NIPAS Areas

The Non-NIPAS areas are similarly managed as the NIPAS areas in terms of conservation and sustainable development interventions. The region's non-NIPAS areas are as follows:

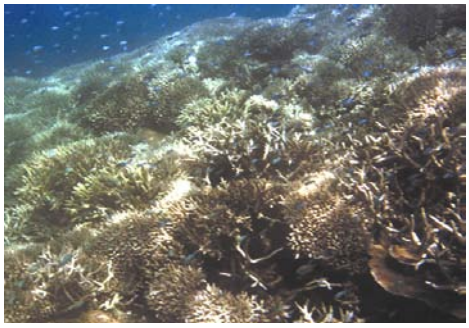
Civil and Military Reservations

Part of the forestland are utilized for Civil Reservation with an area of 13,745 hectares and Military and Naval Reservation covering an area of 10,043 hectares or a total of 23,788 hectares. Military reservations are located in the provinces of Cagayan and Isabela while civil reservations are in located in the provinces of Cagayan, Isabela and N. Vizcaya.

Wetland Areas

Wetland areas in the region are mostly located in the coastal municipalities of Isabela, Cagayan and Batanes. These include coral reef areas, sea grass beds, estuaries, mudflats and mangroves. Region 02 has 12,170 hectares of mangroves and swamplands found in the provinces of Cagayan and Isabela. These bodies

of water are important in maintaining ecological balance and serve as communal fisheries resource for the fisherfolk.



The Coral Reef is a forest in the sea. It houses various species of amphibians and other aquatic species. It serves as a breeding area of marine life. A range of endemic species (species found only in one place and nowhere else) of marine life in the world are found in Philippine coral reefs. The Philippines is home to about 488 species of corals, 971 species of benthic algae and 2000 species of fish.

The region's wetlands are consistently under threat because of unsustainable fishing practices. Of the remaining mangrove and coral reefs in the region, only about 20 percent are considered in excellent condition while the rest were either totally destroyed or in bad condition.

Other Biodiversity-Rich Areas

There are biodiversity rich areas that are outside the declared NIPAS areas. Wildlife species are good indicators of rich biological diversity and health of the forest. In the region, there are five identified important bird areas, namely Buguey Wetlands, Mt. Cagua and Mt. Cetaceo in Cagayan and the Central Sierra Madre covering the southern part of Isabela and northern part of Quirino and Aurora province. Any form of intrusion into these areas is not encouraged.

Second Growth Forest

Second growth or residual forests are logged over areas that regenerated over time and regained or developed bio-ecological capacity to shelter once again various flora and fauna. Most of these areas are commonly found in Cagayan and Isabela where commercial logging was prevalent in the 70's and 80's. These areas are accessible only through temporary logging roads but were left for natural regeneration after logging operations. Contributory factor to the natural growth in these areas is the peace and order situation in the 80's that curbed in-migration. Nevertheless, there are still second growth forest areas which now serve as the settlement areas for upland dwellers.

Buffer Strips/Public Easements

Easements are belts of land along the length of banks of rivers, streams and shorelines of seas and lakes that should remain untouched and free from development.

Under Sec. 268 of the Land Surveys of the Philippines, the bank, streams, esteros, rivers and shore of seas and lakes throughout their entire length and within a zone of three meters in urban areas, 20 meters in agricultural areas and 40 meters in forest areas, along their margins are subject to the easement of public use in the interest of recreation, navigation floatage, fishing and salvage. The clear delineation of these areas can lessen the problems on illegal construction

of permanent structures in easement and within salvage zones, squatting and the non-compliance to PD 953 on planting of trees along river banks.

Flood Prone Areas

The flood-prone areas are those within the inundation coverage of the Cagayan River and its tributaries, which are located in the 52 municipalities located in the provinces of Cagayan, Isabela and Nueva Vizcaya with a total area of 1.86 million hectares (***Figure 28***). Of this inundation area, about 650,243 has. of alluvial plains is presently used for agricultural production. The inundation areas are within the limited areas of lower alluvial plains except for some natural levees with higher elevations. While rich alluvium is deposited in the valley floor, the frequent occurrence of flood and drought in these areas can be destructive and causes considerable farm losses. Settlements near the bank of the Cagayan River or any of its major tributaries are also subject to flood occurrence and damages. Most of these settlements are found in the urban areas of the region, where public easements were disregarded.

Physically Constrained Areas

The other physically constrained areas include severely eroded areas, portions with slopes greater than 50 percent and areas above 1,000 meters in elevation.

The region has a total of 717,261 hectares of areas with 1,000 meters and above elevation. Most of these areas are located in the provinces of Nueva Vizcaya and Cagayan with 224,851 has. and 222,595 has. respectively. Areas with greater than 50 percent slope totaling to about 717,261 hectares, are found mostly in the provinces of N. Vizcaya, Cagayan and Isabela**.**

Erosion largely contributes to the degradation of the environment. This is brought primarily by illegal logging, slash-and-burn or kaingin farming system, and by natural occurrence e.g., intense rainfall, flooding, surface run-off and earthquake. These lead to general loss of the topsoil of the land. There are only about 27.05 percent or 726,022 hectares of land that experience no apparent erosion in the region. A larger part or about 43.18 percent is prone to moderate erosion while 416,644 has or 15.52 percent of total land area experience severe erosion. These areas are common to all the provinces but the

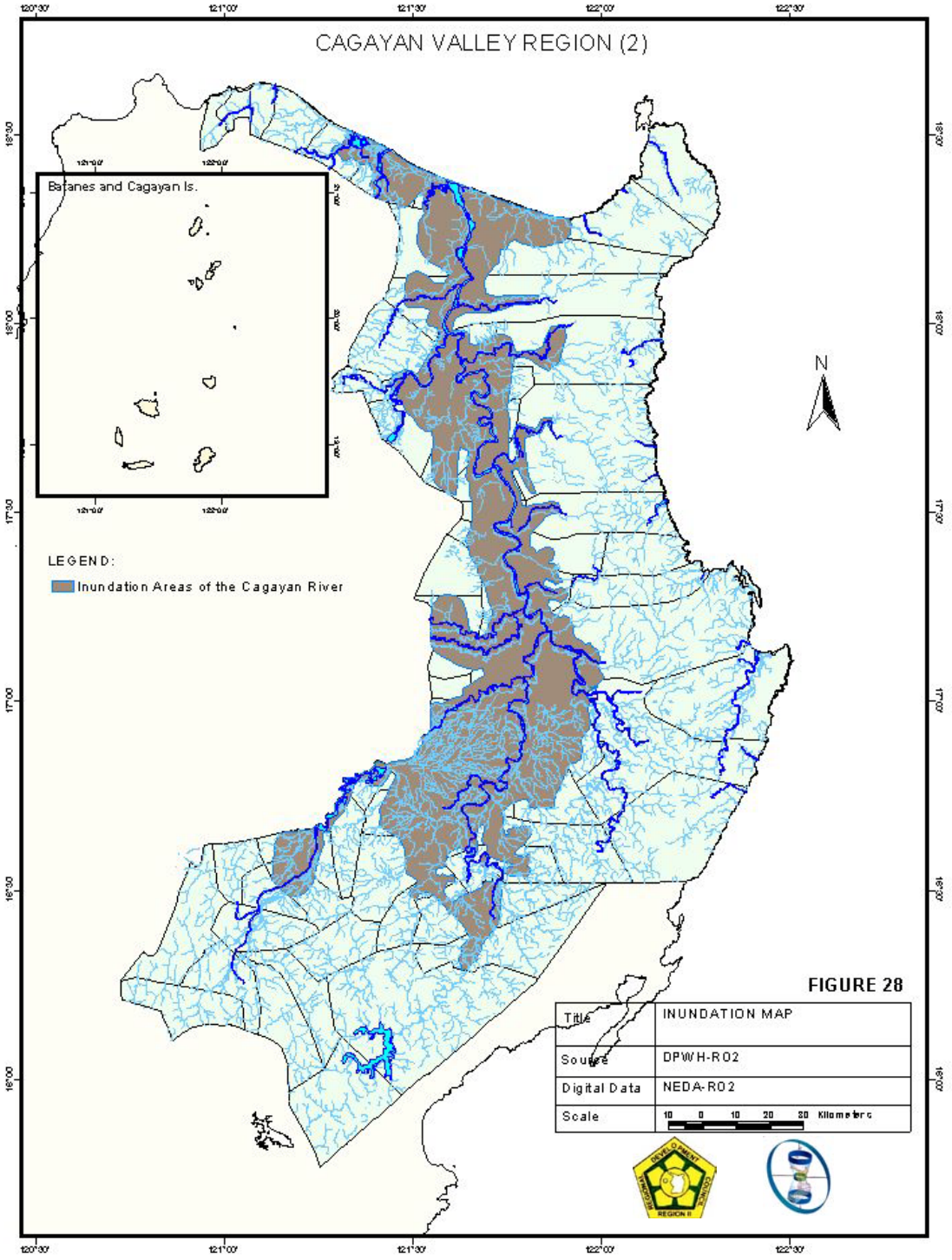


FIGURE 28: INUNDATION MAP

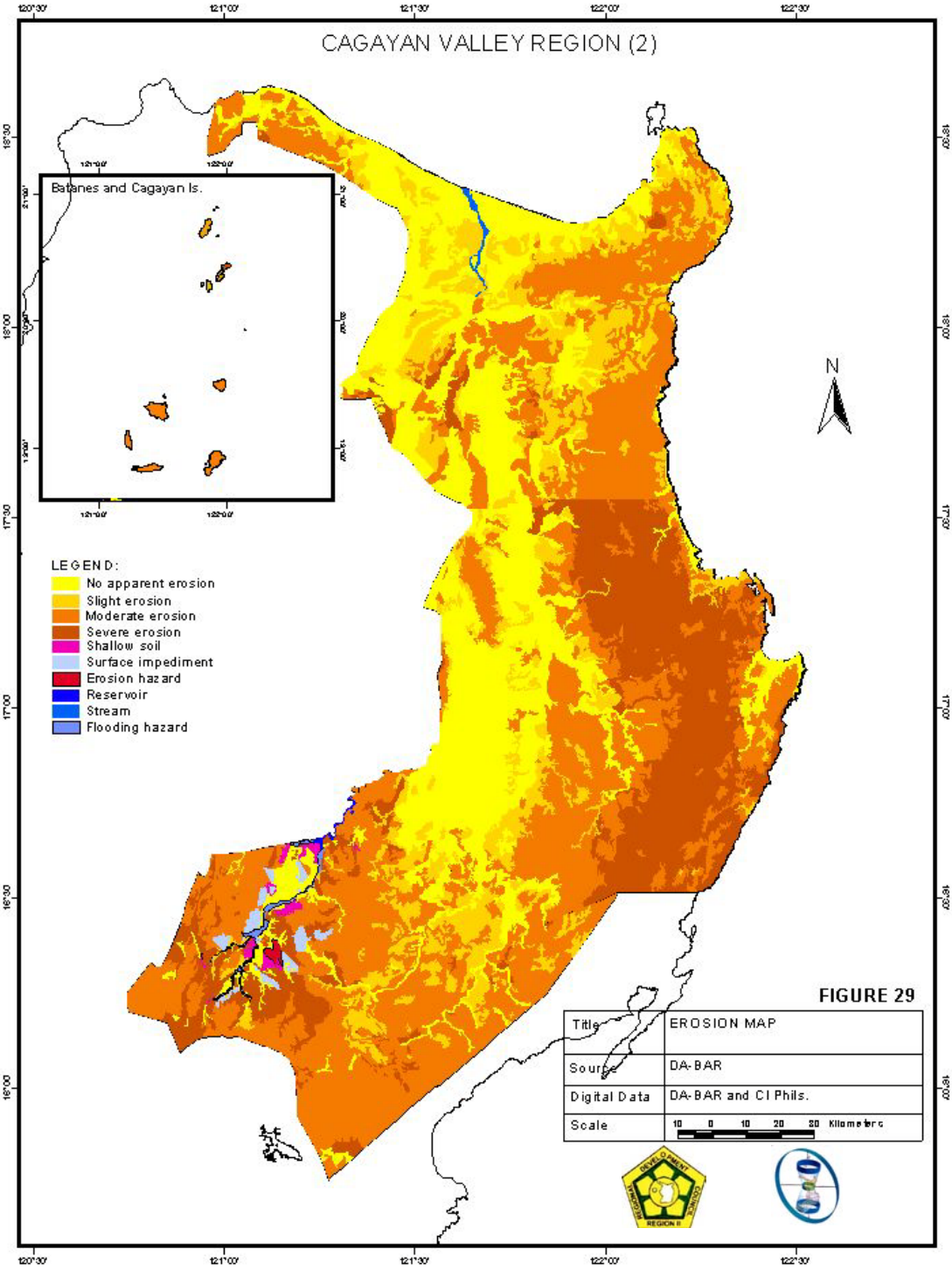


FIGURE 29: EROSION MAP

most prominent are that of Isabela and Nueva Vizcaya with severely eroded areas of 263,838 and 105,567 hectares, respectively. Batanes has the least severely eroded area with 4,551 hectare as shown in Table 32 and Figure 28.

The impact of soil erosion has become much severe in recent years. The most significant on-site impact is the reduction in land productivity. The off-site effects are the sedimentation of the river systems, prolonged flooding and possible flashfloods causing damages to downstream areas.

Table 32. Extent of Erosion Areas, Region 2 by Province: As of 1995

EROSION EXTENT	REGION 02	BAT.	CAG.	ISA.	N. VIZ	QUI.
No apparent Erosion	726,022	516	289,839	353,238	52,159	30,270
Slight Erosion	374,153	3,817	210,560	81,823	4,230	73,723
Moderate Erosion	1,158,953	12,044	370,126	365,373	223,804	187,606
Severe Erosion	416,644	4,551	29,742	263,838	108,567	9,946
Unclassified Erosion	7,986	-	-	2,184	1,627	4,175

Source: DA-BSWM

The hazard-prone areas, which include fault lines, erosion-prone and flood-prone areas, are not properly identified and delineated on the ground. There are hazard prone areas in the region that are presently used for settlements and production purposes. The extent of development in these areas is not regulated thus posing risk to life and property. Fault lines and erosion areas are common in the province of Nueva Vizcaya, Quirino and part of Isabela while flood prone-areas are mostly found in Cagayan and Isabela. Low-lying areas particularly coastal areas are also at risk of sudden surge of sea waves during tropical storms. The unregulated settlements of fishing communities along the shores, also pose great risk to life and property.

f.1.5 Other Areas Subject for Protection

With the approval of the Agriculture and Fishery Modernization Act (AFMA) in 1997, all suitable agricultural lands within the alienable and disposable lands are identified, set aside, and are protected from unreasonable conversion. These privately owned lands are referred to as the Network of Protected Areas for Agriculture and Agro-industrial Development Zone (NPAAAD. The identification and setting aside of the NPAAAD ensures that the future expansion of agriculture and fishery production promoted under AFMA shall be done on economically and environmentally suitable lands **(*Figure 30, 31 and 32***).

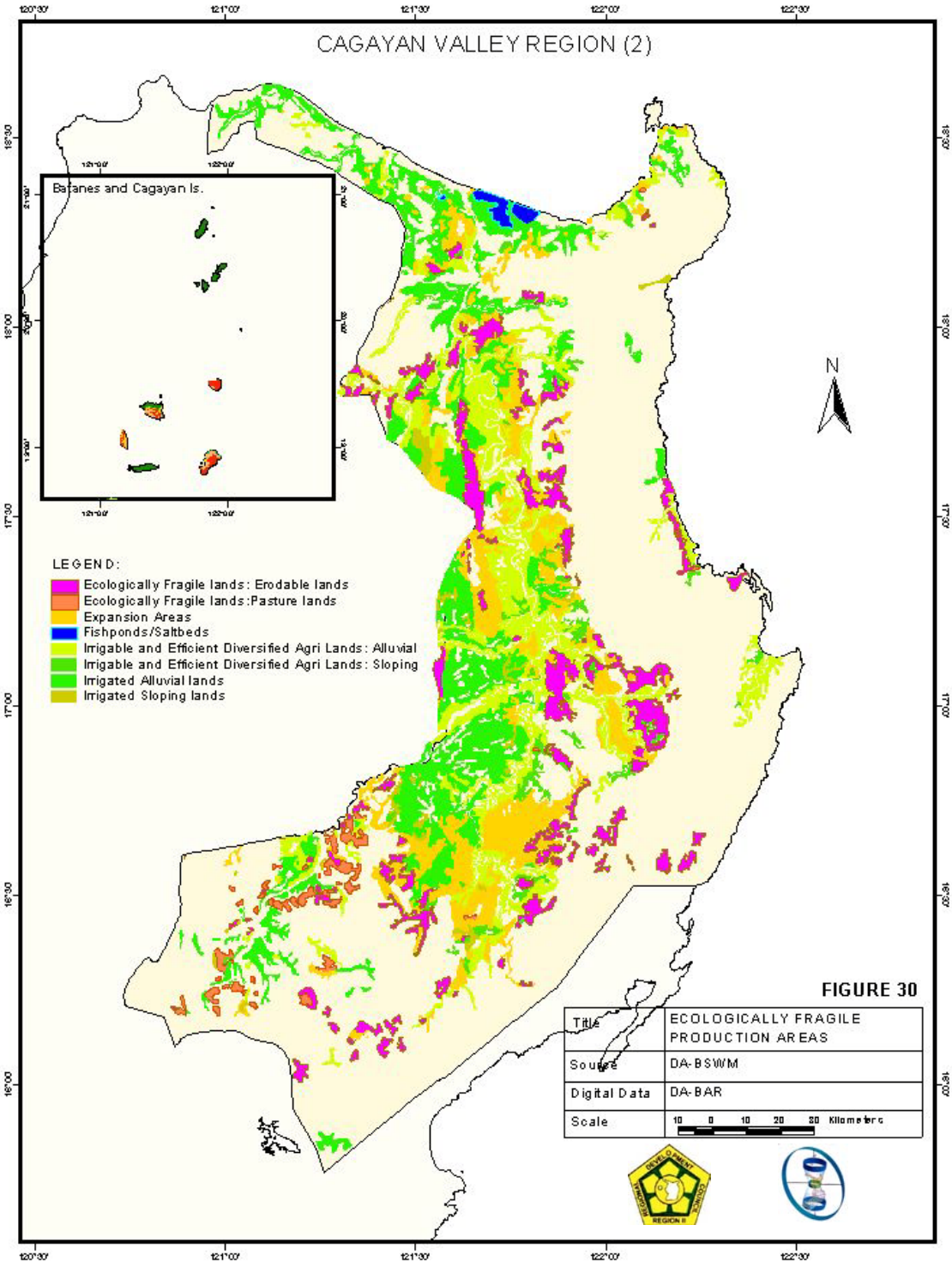


FIGURE 30: ECOLOGICALLY FRAGILE AREAS MAP

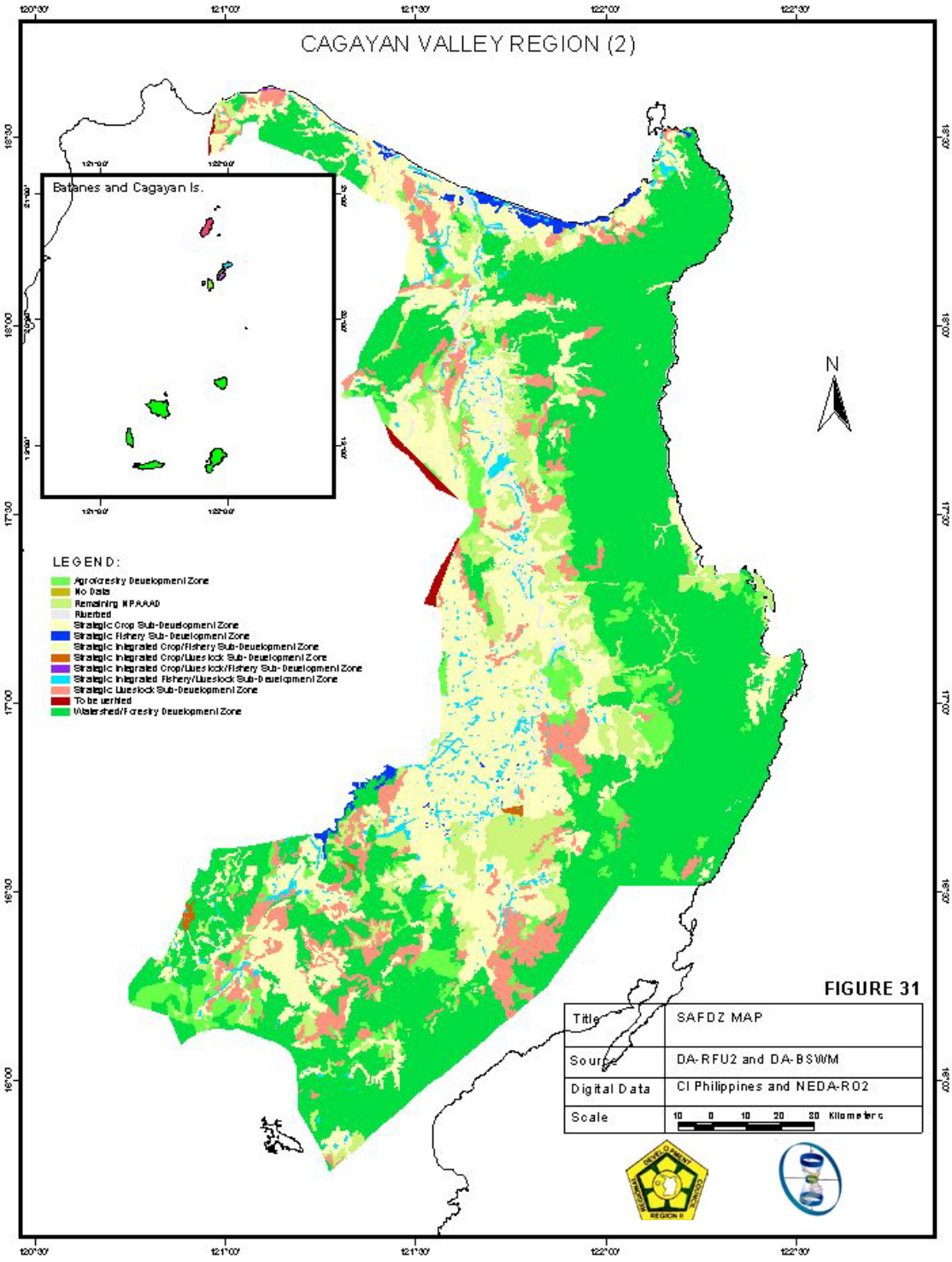


FIGURE 31: STRATEGIC AGRICULTURE AND FISHERIES DEVELOPMENT ZONE (SAFDZ) MAP

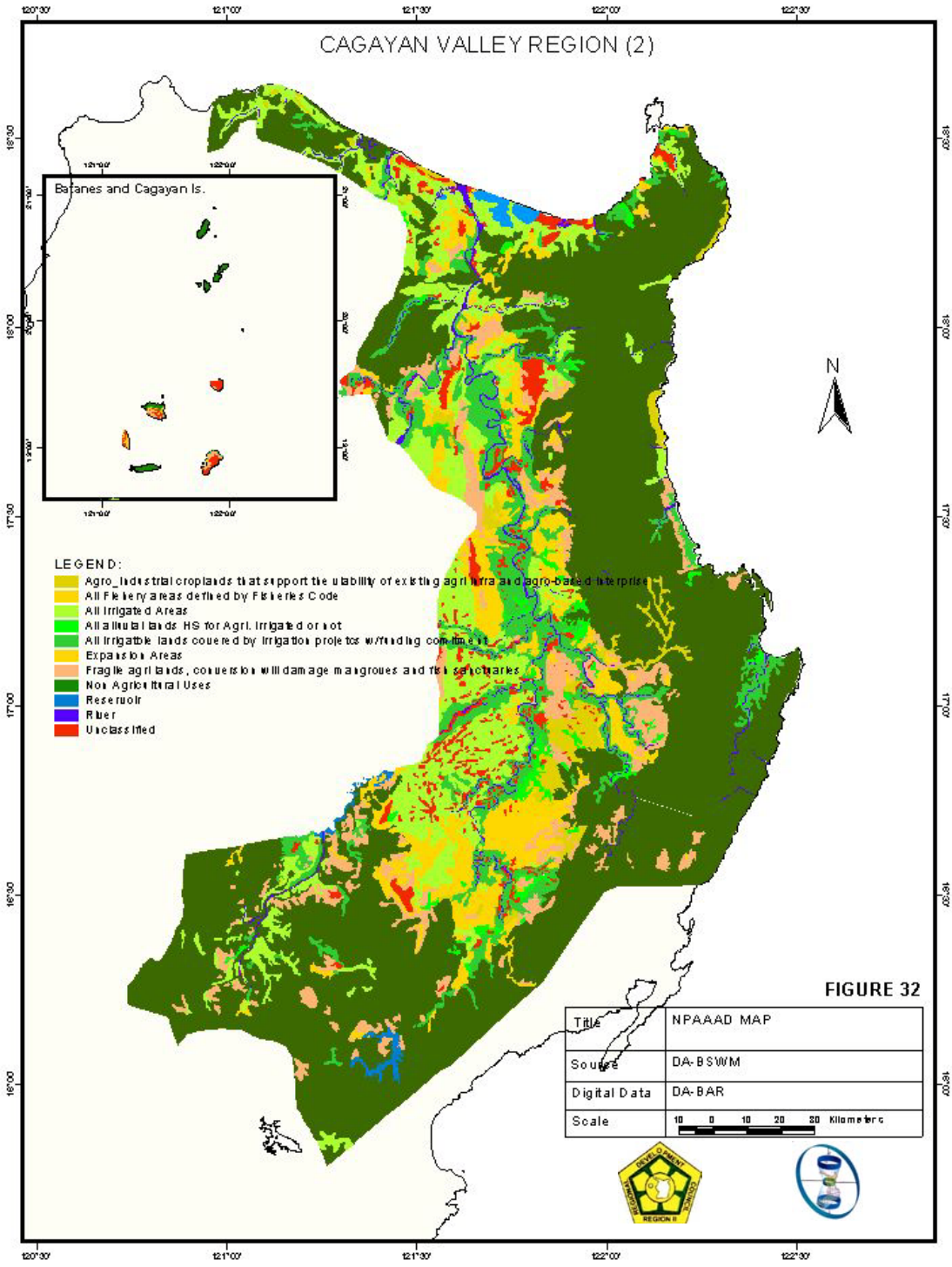


FIGURE 32 – NETWORK OF PROTECTED AREAS FOR AGRICULTURE AND AGRO-INDUSTRIAL DEVELOPMENT ZONE (NPAAAD) MAP

f.2 Production Land Use

Production land use as defined by the National Framework for Physical Planning (NFPP) refers to the direct or indirect utilization of land resources for crop production, timber production, agro-forestry, grazing and pasture, mining, fishing, industry and tourism.

The land use categories ***(Table 33)*** were based on a land use vegetation map prepared by the BSWM. Vegetation maps were derived through aerial mapping or through satellite imagery, which have limitations depending on the time when the images were taken. The area devoted for production land use is about 50.33 percent of the total area of the region or 1,350,799 hectares to include agricultural production areas, grassland/shrubland areas, agro-forestry, fishpond and built-up areas (***Figure 33***).

Table 33. Land Use By Type of Vegetation, Region 2: As of 1995

Land Use Vegetation	Area	%
Agricultural areas	709,964	26.45
Paddy rice irrigated	325,046	12.11
Paddy rice non-irrigated	95,581	3.56
Upland rice	19,610	0.73
Corn	190,445	7.10
Legume vegetable (mongo, peanut cowpea, string beans, baguio beans etc.)	11,812	0.44
Fruit/leafy vegetables (eggplant, tomato ampalaya etc.)	560	0.02
Root crops (cassava, sweet potato, turnips)	6,949	0.26
Spices	240	0.01
Mango	113	0.00
Other Fruit Trees	678	0.03
Banana	12,137	0.45
Sugarcane	5,809	0.22
Coconut	11,099	0.41
Pasture	29,885	1.11
Grassland/shrub land Areas	573,066	21.35
Grasses	523,816	19.52
Shrubs	49,250	1.84
Woodland Areas	1,284,441	47.86
Agro-forest	10,252	0.38
Forest	1,273,991	47.47
Pine tree	198	0.01
Wetland Areas	18,057	0.67
Mangrove, palm tree (nipa)	5,870	0.22
Mangrove tree type (bokawan)	5,198	0.19
Fresh water swamp	1,102	0.04
Fish pond	5,887	0.22
Miscellaneous areas	98,230	3.66
Built-up	51,630	1.92
Beach sand	261	0.01
Kaingin	810	0.03
River wash	13,582	0.51
Rivers/lakes	15,553	0.58
Reservoir	7,986	0.30
Braided river bed	8,408	0.31
TOTAL	*2,683,758*	*100*

Source: DA/BSWM, 1995

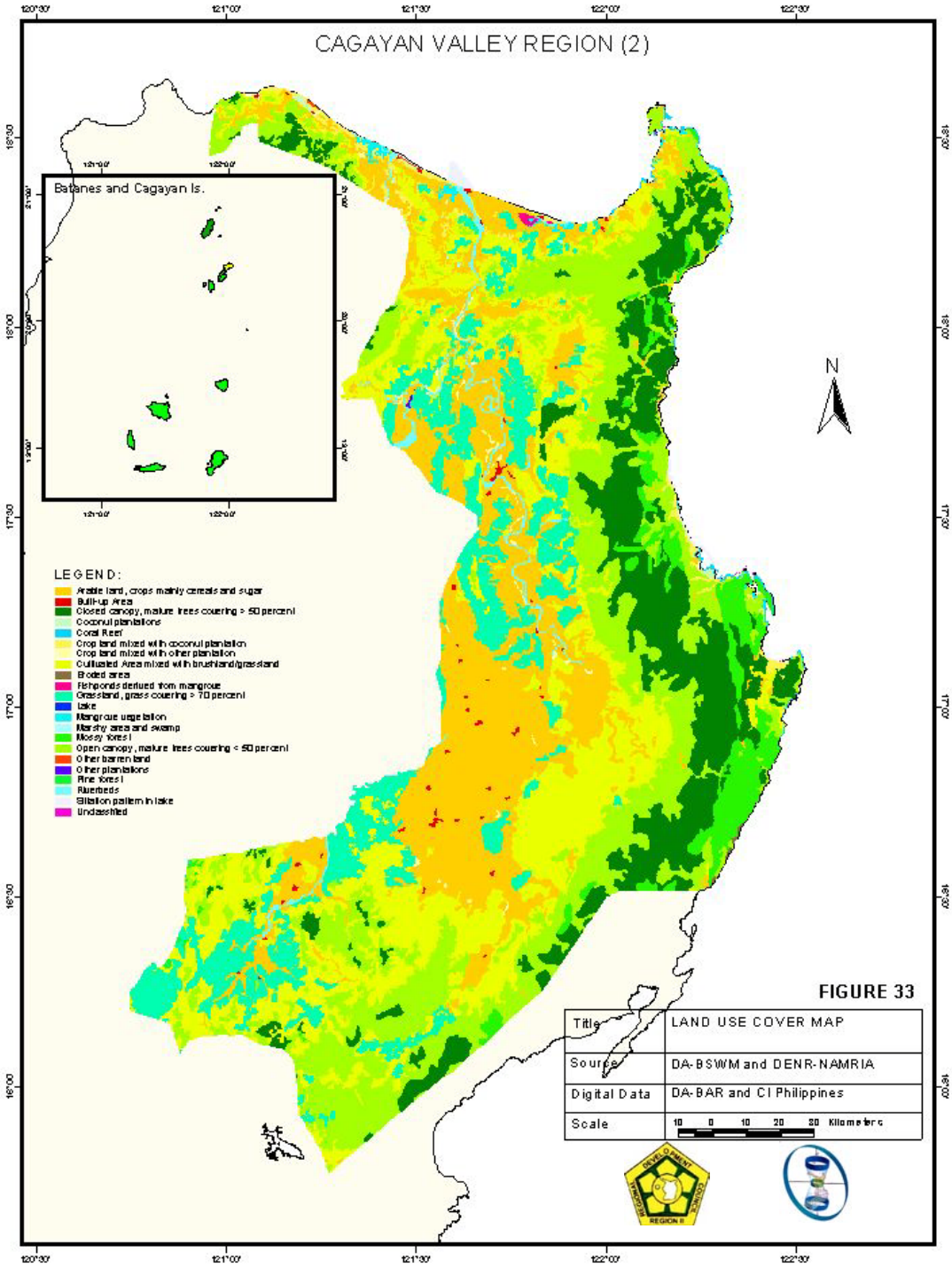


FIGURE 33: LAND USE COVER MAP

f.2.1 Agricultural Lands

Lands devoted to or suitable for planting of crops, growing of fruit trees cultivation of the soil, raising of livestock, poultry, fish or aquaculture are considered part of the agricultural land. The region's agricultural land serve as the major source of food, income and employment to almost 70 percent of the population and contributes about 54 percent to the regional economy.

The present agricultural lands are under threat of conversion to non-agricultural uses. Agricultural lands within urban areas and along the major road networks are converted for residential or commercial areas. For a period of twelve years (1990-2002), the region registered a total of 423 hectares of agricultural land legally converted by DAR to other land uses. Cagayan registered the highest number of applications granted with land conversions at approximately 187 hectares. Aside from the legal land conversions, of greater concern is the incidence of illegal conversion of agricultural lands that remains generally unmonitored, undocumented, and unregulated. The indiscriminate and illegal conversion of prime agricultural lands if not properly addressed would pose a serious problem in the future, especially to the food security programs of the region.

f.2.1.1 Croplands

The total cropland area is about 654,560 hectares (Land Use and Vegetation Data) or 24 percent of the region's land area. In the 1996 Barangay Screening Survey (BSS) by the BAS ***(Table 34),*** the total area planted to crops was 630,564 hectares but only 96.7 percent or about 610,383 hectares were considered active agricultural areas. This means that the region's cropland areas were not fully utilized. The total cropland as reflected in the 1997 BSS showed a remarkable increase of 19.85 percent when compared to the 1992 NSO data on Farm Area by Mainland Utilization ***(Table 35).*** The NSO data for the area planted to temporary crops was 444,319 hectares while the BSS Survey shows 555,240 hectares, an increase in area of 110,921 hectares for the five years period. Active agriculture areas were presently devoted to grains, vegetable, rootcrops and fruits production. Most of these cropland areas were concentrated in Isabela and Cagayan with 341,105 hectares and 211,405 hectares, respectively.

Table 34. Distribution of Physical Area Devoted to Crop Production, Region 2
By Province: As of January 1997 (in hectares)

	BATANES	CAGAYAN	ISABELA	N. VIZCAYA	QUIRINO	REGION 02
ALL CROPS	3,759.91	197,308.03	325,383.69	61,322.71	42,790.02	630,564.36
Palay	156.88	121,203.98	158,079.75	31,228.96	10,149.05	320,818.62
Irrigated	-	71,234.95	127,420.75	26,669.59	7,303.30	232,628.59
Rainfed	-	47,791.03	24,164.65	3,482.13	1,343.75	76,781.56
Upland	156.88	2,178.00	6,494.98	1,077.24	1,502.00	11,409.10
Corn	168.52	39,425.23	128,272.70	8,920.47	13,343.11	190,130.03
White	67.17	9,493.16	11,133.05	968.48	515.75	22,177.61
Yellow	101.35	29,932.07	117.139.65	7,951.99	12,827.36	167,952.42
Other Temp. Crop	1,758.55	17,752.51	13,158.95	8,949.23	2,311.91	43,931.15
Permanent Crops	1,675.96	18,926.31	25,512.29	12,224.05	16,985.95	75,324.56

Source: Barangay Screening Survey-BAS R2

Table 35. Farm Area by Mainland Utilization, Region 2 by Province: As of 1992

UTILIZATION	BAT.	CAG.	ISA.	N. VIZ.	QUI.	R02
All classes	3,640	165,233	263,339	56,796	43,432	532,440
Homelot	31	3,200	3,735	663	358	7,987
Under Temporary Crops	2,217	140,748	229,608	44,909	26,837	444,319
Under Permanent Crops	331	10,703	19,400	9,449	7,121	47,004
Temporarily Fallow	358	4,373	846	319	180	6,076
Under Temporary Meadows and Pastures	146	1,038	973	453	305	2,915
Under Permanent Meadows and Pastures	504	3,380	5,590	815	139	10,428
Woodland and Forest	23	1,464	764	103	273	2,627
Other Lands	29	327	2,423	85	8,219	11,083

Source: National Statistics Office, 1992

Grains Production

Region 02 is basically grain producing and is noted in the year 2002 as the first and second largest producer of corn and palay in the country, respectively. About 572,289 hectares or 87.43 percent of the total cropland area is planted to grains (Based on the Land Use and Vegetation Data). Of this area, 65.4 percent or 374,218 has. are devoted to rice and 34.6 percent or 198,071 has. are planted to corn. As an agri-based economy, most of the industries or economic activities that were established support the grains industry such as ricemills, warehouses, trucking and trading, among others. In 2000, the region was able to produce 1.785 Million MT of palay and 0.951 Million MT of corn **(*Tables 36 and 37*)**.

Table 36. Rice Production and Area Harvested, Region 2, by Province
1995 and 2000 (in MT and hectares)

Province	1995		2000	
	Production	Area Harvested	Production	Area Harvested
Region 02	1,350,068	403,111	1,785,137	492,933
Cagayan	349,003	125,968	513,600	164,633
Isabela	799,787	217,062	1,034,297	260,140
Quirino	45,328	15,054	54,514	17,221
Nueva Vizcaya	155,140	45,027	182,726	50,939

Source: DA-BAS

Table 37. Corn Production and Area Harvested, Region 2 by Province
1995 and 2000 (in MT and hectares)

Province	1995		2000	
	Production	Area Harvested	Production	Area Harvested
Region 02	604,870	250,009	951,904	294,546
Cagayan	107,145	60,031	133,571	56,701
Isabela	411,266	159,836	675,716	196,681
Quirino	45,643	27,786	56,877	25,453
Nueva Vizcaya	40,816	13,452	85,740	15,711

Source: DA-BAS

Of the 440,237 hectares classified by the BSWM as ricelands, BAS BSS survey in 1997 ***(Table34)*** shows that actual area planted is only about 320,818 hectares or 72.8 percent. This is further disaggregated as irrigated ricelands (232,627 hectares or 72.51 percent), rainfed areas (76,781 or 23.93 percent) and upland rice (11,409 hectares or 3.5 percent) as shown in Figure 32. The area devoted to rice production did not change but the area harvested varied quarter-by-quarter depending on several factors attendant during the quarter. Based on the NIA data, the potential irrigable area is about 472,640 hectares of which only 46.32 percent was irrigated as of 2000. These potential irrigable areas include rainfed areas and areas presently planted to corn and other agricultural commodities. While areas suitable for rice may have been underutilized, there are also marginal rice lands that are actually more suitable for other crops. Most of these are upland rice areas ***(Figure 34)*** where drip or gravity irrigation is commonly used. In terms of provincial distribution, Isabela covers the biggest portion of the region's ricelands with 158,079.75 hectares (***Figure 35***).

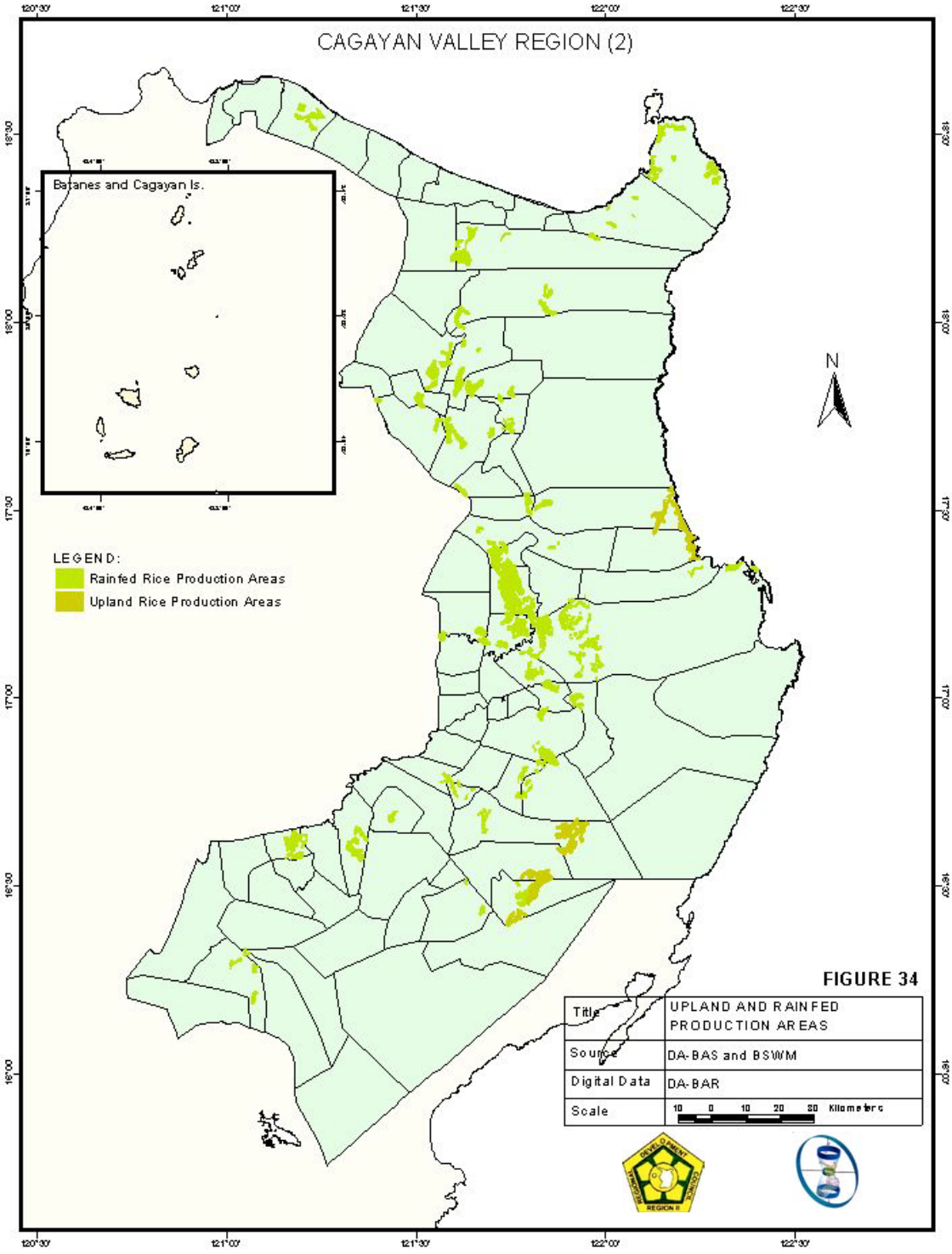


FIGURE 34: UPLAND AND RAINFED PALAY AREAS MAP

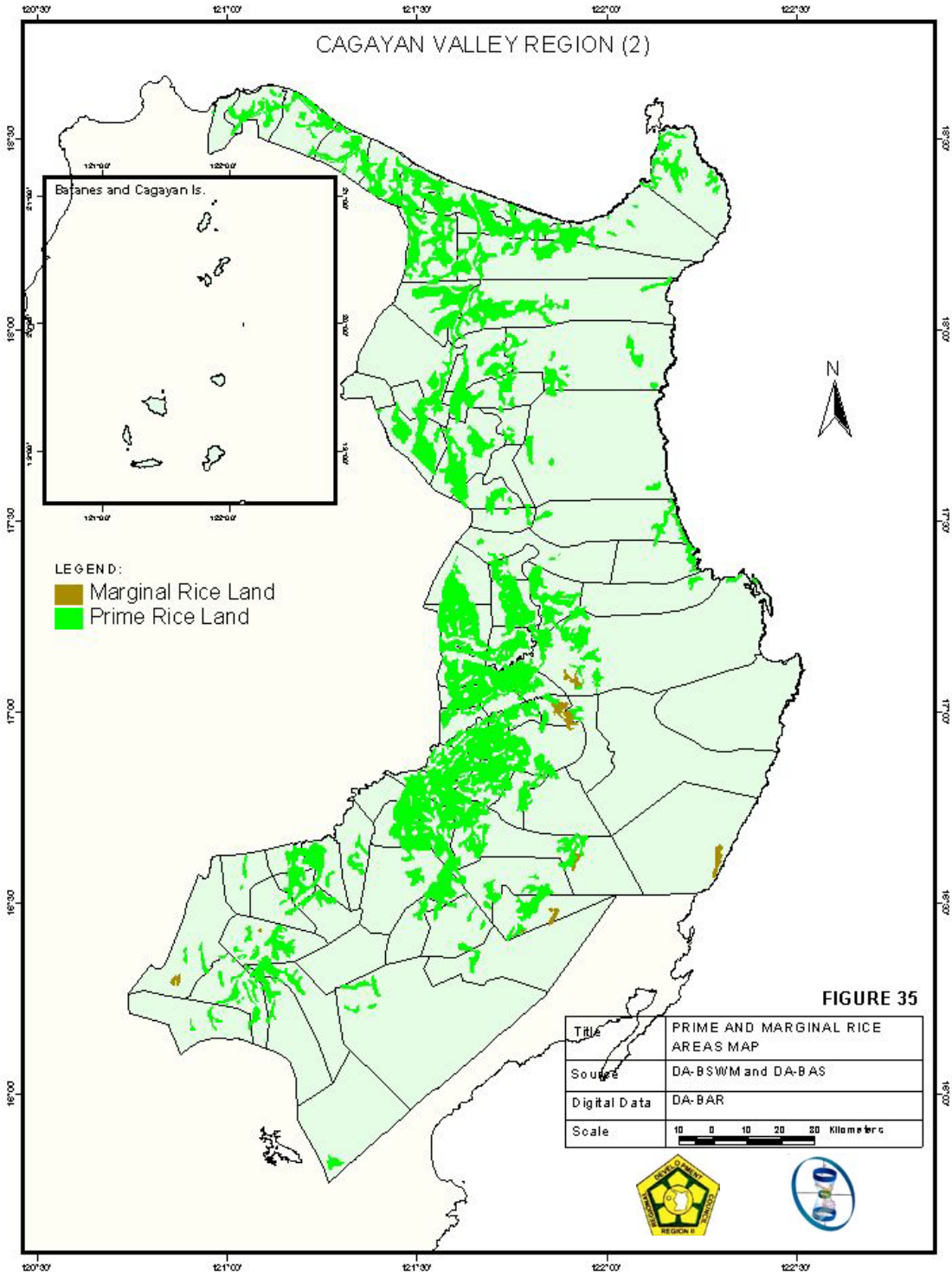


FIGURE 35: PRIME AND MARGINAL RICELAND MAP

In the case of corn, the total area used for production was 190,130 hectares in 1997 ***(Table34).*** Of this area, about 88 percent is planted to yellow corn while the remaining 22,177 hectares is planted to white corn. White corn is usually produced as a staple food in areas where rice is difficult to produce. There are still significant areas in the provinces of Isabela and Cagayan, which are producing white corn as an alternative for rice. From the total area planted to corn, about 11,843 hectares are considered marginal lands, usually found in severely eroded areas with steep to very steep slope, mostly located in the province of Isabela. Based on 1995 corn-based cropping system development and soil conservation planning conducted by the Agricultural Land Management and Evaluation Division (ALMED) of the BSWM, the land use conflicts on potential corn lands cover 775,513 hectares. These include 396,019 hectares presently utilized to other crops, like rice, other temporary crops and permanent crops and 379,494 hectares of idle lands found in lowland and upland areas.

The region's potential agricultural expansion area is about 234,876 hectares. This is in addition to the 610,383 hectares, which is considered active agricultural areas **(*Figure 36***). If fully developed, the region is utilizing about 845,259 hectares or 31,5 percent of its total land area for agricultural production. A potential expansion area by agricultural commodity shows that rice has the biggest area for development. These areas are potential irrigable area and/or presently planted to corn or other agricultural commodities but most suitable for rice production. On the other hand, there are also areas presently planted to rice but are more suitable for other crops production. Other potential expansion areas for crops production are the idle or underutilized grassland and shrubland with a total area of 379,495 hectares, most of which are located in the region's production forest area in the province of Cagayan and Isabela.

On productivity, the average yield for palay is 3.70 MT per hectare in 2002, way below the regional target of 4.29 MT/has. On the other hand, productivity level for corn was recorded at 3.04 MT/hectare as compared to the target of 4.02 MT/has. The productivity for rice and corn registered one of the highest among regions. The region could only register the highest individual yield 4.3 MT/has. and 3.7 MT/has., for palay and corn, respectively. Productivity for the other agricultural commodities is even lower with most of the regional requirements being imported from other regions.

The region's low grain productivity can be attributed to several factors which include low adoption of cost reducing and location specific technologies; low receptiveness to farm mechanization; high preference for in-bred varieties; high post harvest losses and poor grain quality; poor farm to market roads; and occurrence of pest outbreaks. In addition, farm management is left to the older group of the population. While it is observed and recognized that the proportion of the population involved in agriculture are falling for the past forty-years, generational gaps in life priorities severely affected agricultural productivity. Course preferences are inclined towards white-collar jobs, evidenced by the low enrollees in agriculture-related courses.

Unsustainable farming methods and technologies also contribute to the low farm productivity and to the degradation of the resources most especially in marginal and subsistence farms.

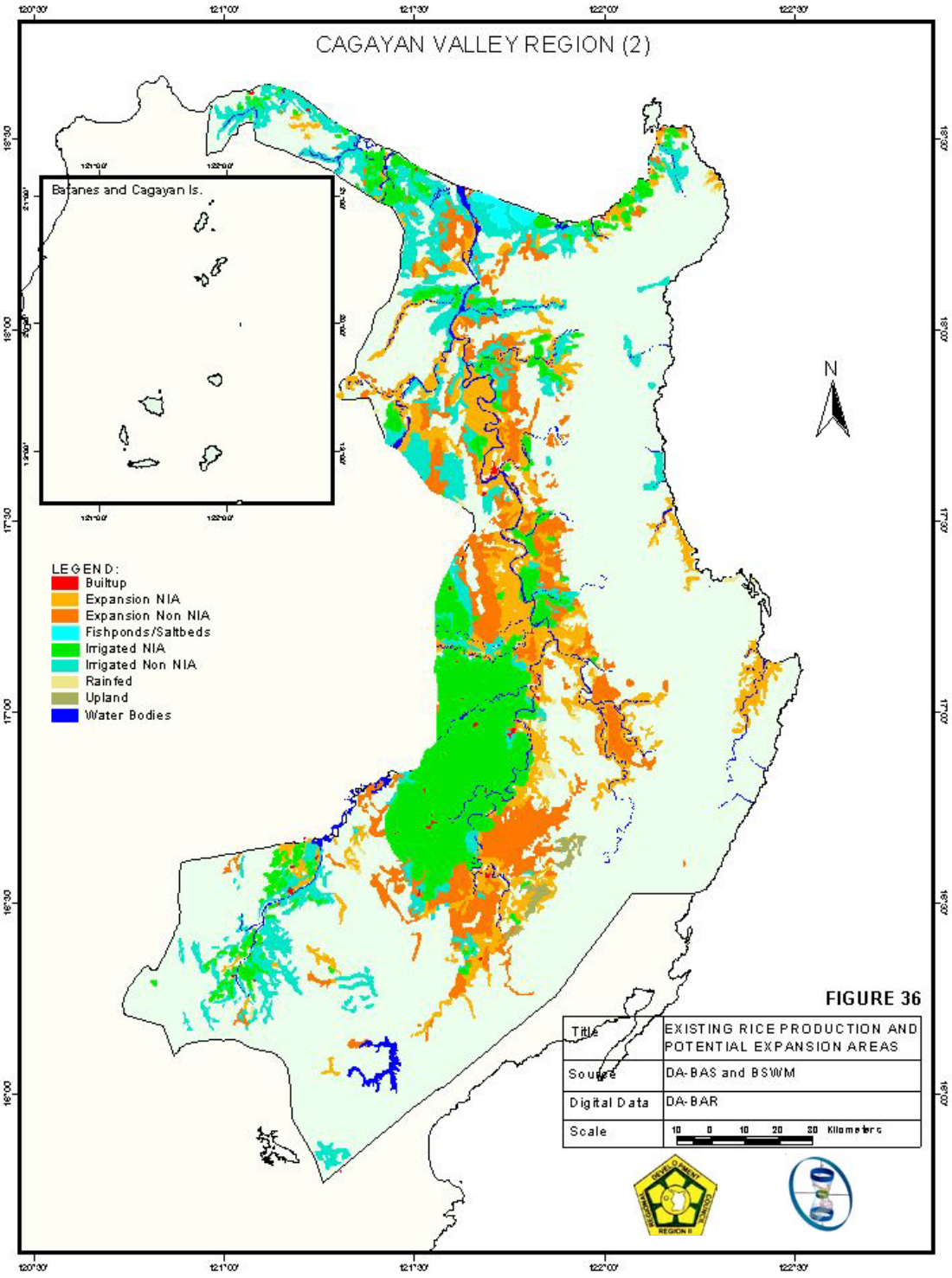


FIGURE 36: EXISTING AND POTENTIAL RICE EXPANSION AREAS MAP

Almost 87.43 percent of the region's agricultural areas are devoted to grains production, which require intensive tillage and application of inorganic inputs particularly of fertilizers and pesticides. This unsustainable practice is brought about by their desire to increase agricultural yield. The diminishing agricultural output manifests only when the carrying capacity of the land had taken its toll. Inorganic farm inputs also seep into the water table underneath and into the atmosphere disturbing natural ecosystems that are beneficial to farmers. Extensive use of pesticides may affect not only damaging pests but also agri-friendly insects in the farms.

High Value Commercial Crops

Based on 1995 BSWM data, the region had a total area of 49,397 hectares planted to high value commercial crops. BAS on the other hand, reported a greater area planted to high value commercial crops at 119,255 hectares in 1997 ***(Table 34).*** The difference in the data is due to the practice of interspersing and intercropping high value commercial crops with corn or crop rotation in rice areas.

The region's vast fertile lands serve as add-on for high-value crop production. The region's major temporary and permanent high-value commodities are bananas, mangoes, citrus and sugarcane ***(Tables 38 and 42).*** In 1997, it contributed 6.4

percent to the country's total banana production with a total of 32,759 hectares area planted. Isabela and Quirino have the largest area planted at 12,951 and 12,592 hectares out of the total area planted, respectively. Most of these plantations are located in the foothills of the Sierra Madre in the western side, which extends to the province of Cagayan. The region was also third to Region 1 and Region 4 in mango production for year 1997. It had 9,472 hectares planted to mangoes mostly located in the provinces of Nueva Vizcaya and Isabela at 3,893.48 and 2,989.79, respectively. Carabao mango production is growing industry in the region. For 2003, the estimated total production was about 14,000 tons but may still increase when the 245,790 non-bearing trees of the total carabao mango tree population (401,090 trees) will start bearing fruit ***(Table 39).***

Table 38. Distribution of Physical Area Devoted to Permanent Crops Production, Region 2 by Province: as of January 1997 (in hectares)

	Batanes	Cagayan	Isabela	N. Vizcaya	Quirino	Region 02
PERMANENT CROPS	1,675.96	18,926.31	25,512.29	12,224.05	16,985.95	75,324.56
Banana	102.95	4,843.48	12,592.36	2,270.00	12,951.09	32,759.88
Coconut	1,406.90	7,899.30	4,364.57	1,179.73	394.06	15,244.56
Mango	52.42	1,670.04	2,989.79	3,893.48	867.19	9,472.92
Citrus	45.19	1,187.93	952.58	609.80	585.12	3,380.62
Santol	0.33	626.37	776.31	348.41	247.56	1,998.98
Caimito	1.45	636.51	773.86	243.79	178.65	1,834.26
Coffee	0.16	250.13	486.54	2,400.20	958.75	4,095.78
Pineapple	13.97	452.32	420.10	241.07	90.50	1,217.96
Jackfruit	4.62	270.84	403.77	259.46	249.60	1,188.29
Guava	15.12	225.06	329.36	159.75	73.80	803.09
Guyabano	-	104.76	298.16	99.56	67.14	569.62
Avocado	8.91	260.06	287.25	202.50	124.28	883.00
Papaya	23.43	209.84	215.57	64.13	91.39	604.36
Mallungay	0.49	100.47	194.02	39.44	22.67	357.09
Tamarind	-	113.33	186.74	91.70	35.07	426.84
Cashew	-	12.58	112.57	38.47	10.58	174.20
Cacao	-	48.27	77.03	21.88	9.99	157.17
Duhat	-	7.21	37.68	24.16	8.95	78.00
Lanzones	0.02	5.50	8.28	14.62	0.83	29.25
Rambutan	-	2.31	5.83	17.57	13.63	39.34

Sourcea: DA-BAS R2, 1997 Barangay Screening Survey

Table 39. Inventory of Carabao Mango Trees and Area Planted Region 2 by Province: 1997

Province	Number of Trees			Area Planted (ha.)
	Bearing	Non-Bearing	Total	
Cagayan	14,564	26,627	41,191	411.92
Isabela	69,064	120,406	189,470	1,894.70
N. Vizcaya	54,631	84,904	139,535	1,395.35
Quirino	17,040	13,853	30,893	308.93
Region 02	155,300	245,790	401,090	4,010.90

Source: DA-BAS R2

The area for citrus production has also expanded for the past seven years. From 970 hectares in 1990, the area planted to citrus had reached 3,236 hectares. The biggest area planted to citrus is found in Cagayan with an area of 1,187 hectares. Citrus development is also on-going in Nueva Vizcaya which is known for its "Perante Oranges". Nueva Vizcaya has an aggregate area of more or less 510.64 hectares as of 1997 but increased to 1,000 hectares as of 2001, mostly in Kasibu ***(Table 40)***.

Table 40. Citrus Production, Region 2 by Province: CY 1997

Province	Area Planted (ha.)	No. of Trees	Fruit Bearing	Non-Bearing
Cagayan	1,187.92	520,058	394,272	125,769
Isabela	952.58	433,333	324,859	108,474
N. Vizcaya	510.64	192,593	107,987	84,606
Quirino	585.12	141,256	115,237	26,019
REGION 02	3,236,26	1,287,250	942,355	344,895

**Source of Data: Barangay Screening Survey (BSS), 1997 conducted by BAS & DA.*
Varieties of Citrus include sweet orange, mandarin, pommelo and calamansi.

Table 41. Temporary Crops Production, Region 2 by Province: As of January 1997
(in hectares)

	Batanes	Cagayan	Isabela	N. Vizcaya	Quirino	Region 02
Other Temporary Crop	1,758.55	17,752.51	13,158.95	8,949.23	2,311.91	43,931.15
Mongo	24.47	1,212.28	2,268.93	97.12	177.35	3,780.15
Beans	10.78	1,096.63	1,191.74	618.74	309.21	3,227.10
Tobacco	2.53	414.23	1,157.96	33.29	15.64	1,623.65
Cassava	18.00	1,069.00	994.15	253.44	140.11	2,474.70
Sugarcane	809.56	6,369.40	965.10	18.22	32.82	8,195.10
Camote	208.72	1,256.10	900.80	1,922.69	159.93	4,448.24
Peanut	4.42	1,237.28	860.07	468.32	247.48	2,817.57
Eggpalnt	5.71	841.01	820.97	174.62	76.83	1,919.14
Gabi	48.32	648.40	550.86	427.52	116.38	1,791.48
Amplaya	4.50	485.38	475.41	131.85	97.54	1,194.68
Habitchuelas	1.12	98.37	451.18	825.40	282.52	1,658.59
Squash	11.92	413.72	443.94	758.53	65.24	1,693.35
Tomato	10.08	388.49	349.23	605.46	73.78	1,427.04
Okra	4.01	356.91	287.81	74.41	23.92	747.06
Watermelon	16.78	155.23	264.29	25.45	21.46	483.21
Pepper	7.06	228.72	251.13	301.44	52.16	840.51
Pechay	10.94	286.12	249.38	91.43	19.76	657.63
Upo	2.06	232.76	214.38	36.51	21.97	507.68
Patola	3.62	260.35	211.97	46.12	28.39	550.45
Ginger	11.68	198.49	139.81	783.24	166.72	1,299.94
Soybeans	0.28	48.23	99.07	16.25	3.85	167.68
Ubi	194.02	190.74	98.13	57.92	103.02	643.83
Cowpeas	-	12.05	70.12	3.79	-	85.96
Onion	39.30	46.22	57.00	195.51	13.57	351.60
Garlic	289.12	34.46	27.75	63.34	10.46	425.13
Cabbage	-	64.59	20.72	149.71	7.35	242.37
Cucumber	1.91	11.94	19.26	72.86	0.12	106.09
Kangkong	-	2.25	16.57	34.34	-	53.16
Sweet Peas	0.89	12.53	15.57	281.56	17.35	327.90
Wingbean	-	32.55	12.08	15.35	8.20	68.18
Carrots	2.49	5.50	9.72	131.29	5.60	154.60
Alugbati	-	10.05	9.17	4.06	3.40	26.68
Patani	-	22.88	6.51	17.70	4.27	51.36
Chayote	0.58	6.90	4.65	141.68	4.16	157.97
Irish Potato	0.25	2.74	3.51	69.27	0.75	76.52
Asparagus	-	-	0.64	0.50	0.10	1.24

Source: DA-BAS R2, 1997 Barangay Screening Survey (BSS)

Projected Space Requirements for Crops

The region's space requirements to provide its projected population demand for basic food items is shown in Table 42**.** As to the future land requirement for staple food, the existing areas planted to rice at 320,818 hectares and corn at 190,130 hectares are more than enough to meet the region's future land requirement of 161,000 hectares for rice and 10,000 hectares for corn by 2030. This is in contrast to the national level situation where the country's total rice and corn farmlands are projected to be insufficient to meet total population demand by 2030. The excess of about 339,948 hectares from the region's farm area requirements by 2030 implies that Region 02 may continue to provide part of the country's future demand for grains with the existing production area levels. This also implies that the region can utilize excess land for the production of high value commercial crops where the region has low sufficiency level. This is consistent with the thrust on crop diversification where farmers are expected to derive greater income.

The over-concentration in grains production gives less comparative advantage and less value added for these commodities. Even with the estimated land requirement for grains of 171,000 hectares for the next thirty years, the region can still ensure surplus production through interventions improving productivity or yield and crop intensification.

Table 42. Projected Land Requirement of Food Cereals, Livestock and Poultry and Fisheries, Region 2: 2000-2030 (in hectares)

Food Group	Existing Area (hectares)	2000	2010	2020	2030
Cereals	510,948	118,000	141,000	157,000	171,000
Rice	320,818	112,000	133,000	148,000	161,000
Corn	190,130	7,000	8,000	9,000	10,000
Large Animals	573,066	9,375	11,137	12,471	13,530
Carabao		N	n	n	n
Cow		9,375	11,137	12,471	13,530
Small Animals	573,066	18,000	21,000	23,000	25,000
Pig		18,000	21,000	23,000	25,000
Others		N	n	n	n
Poultry	12,000	6,250	7,425	8,314	9,020
Fishpond	5,887	2,000	2,000	2,000	3,000

Source: NFPP for projected land requirement
(Estimates are based on 1993 per capita consumption)

f.2.1.2 Livestock

About 573,066 hectares or 21.35 percent of the total land area of the region is classified as grassland or shrubland of which 346,482 hectares is classified as rangeland or grazing land. However, these areas are not optimally utilized for its most suitable use, which is livestock production.

Backyard raisers continue to dominate the development and expansion of large ruminant

production and remain dependent crop residues for livestock nutrition. Backyard livestock represents 80 to 90 percent of total inventory from 1998 to 2000 **(*Table 43*)**. Most people still prefer backyard raising with an average of two heads of carabao per rural household. Carabao is preferred than cattle or other ruminants. The use of carabaos as draught animals explains the strong preference of farmer. Most of these animals lack proper nutrition since agricultural waste is used as feeds substitute. During the dry season when there is no available agricultural waste, backyard livestock are brought to distant grasslands to satisfy their nutritional needs. This practice contributes to the temporary swelling in the number of animals utilizing grasslands during the dry season.

The commercial livestock production of the region remains nominal representing only 10-20 percent of the total inventory. This explains the vast grasslands left unutilized or low sufficiency in beef.

For established small to medium-scale livestock production in the region, mostly under pasture leases, management of the land includes development of forage pasture and reforestation. But for grassland areas not covered by pasture lease agreements, land development is not included and even subjected to further deterioration due to unsustainable practice.

Table 43. Livestock Production, Region 2: 1998-2000
(No. of Heads)

Livestock/farm type	1998	1999	2000
Cattle	144,340	147,520	152,493
Backyard	129,618	133,007	138,269
Commercial	14,722	14,513	14,224
Carabao	311,920	313,853	318,965
Backyard	311,568	313,500	318,646
Commercial	352	353	319
Swine	590,404	565,295	527,780
Backyard	580,931	550,806	527,260
Commercial	9,473	14,489	520
Goat	90,532	95,058	107,921
Backyard	89,892	94,358	107,463
Commercial	640	700	458
Duck	1,146,498	878,499	835,043
Backyard	649,254	715,036	693,062
Commercial	497,244	163,463	141,981
Chicken	7,252,133	7,149,875	7,018,329
Backyard	5,888,670	6,291,124	6,331,522
Commercial	1,363,463	858,751	686,807
Total	9,535,827	9,150,100	8,960,531
Backyard	7,649,933	8,097,831	8,116,222
Commercial	1,885,894	1,052,269	844,309

Source: BAS Region 02

The feed resource base for ruminant production is essentially made up of the grasslands, the weeds and residues from croplands, the cultivated pastures and industrial by-products. With population pressure, most of the grasslands and plantation areas are utilized for crop production instead of livestock. Most grassland areas were nutrient-depleted because of past unsustainable farming practices rendering crop development as uneconomical at present. However, these can be revived for livestock production while reviving back the fertility of the soil.

Estimated Projected Land Requirement for Livestock and Poultry

Estimates for projected land requirement for livestock ***(Table42)*** shows that the region needs about 38,530 hectares for combined large and small ruminants to meet the meat requirements of the region's population in thirty years. The 573,066 hectares of grasslands and brushlands are therefore seen as a potential area for livestock development, especially commercial livestock production expansion. Management of large ruminants is capital intensive and requires development of managed pastures. These require fresh capital investment for livestock development to achieve surplus production. Sufficiency level for beef and carabeef is 85 percent and 72 percent, respectively. Sufficiency for pork and poultry is much lower at 52 percent and 7 percent, respectively. Feeds were sourced from other regions where feed mills are mostly located. The high cost of inputs, due to transportation cost, contributes to the waning hog and poultry industry. The region is the top producer of yellow corn, which is one of the components in feed mills. There were initiative of establishing local feed mills, but most were not sustained due to its capital-intensive nature. There are also contract growers in the region, at least to mitigate supply shortages, but productions are not sold locally.

f.2.2 Areas Committed for CARP

Within the region's agricultural lands and idle lands are areas subjected to the Comprehensive Agrarian Reform Program (CARP). These areas are strictly prohibited for conversion to other uses especially if said areas are riceland or cornland areas. Areas identified for CARP distribution but have not been distributed to date to its intended beneficiaries are covered by the prohibition.

Table 44. Land Distribution (in hectares)
Region 2: as of 2000

Mode	Area	% Share
Operation Land Transfer	67,777	13.6
Government Owned Lands	88,659	17.7
Settlements and Landed Estates	41,443	8.3
Private Agricultural Lands	77,654	15.5
Public A&D Lands	93,961	18.8
Integrated Social Forestry Areas	130,440	26.1
Total	499,934	100

Source: National Statistical Yearbook, 2002

Cumulative data from 1987 to 2000 show that the region was able to acquire and distribute a total of 499,934 hectares or 90.2 percent of identified CARP areas of 554,286 hectares. This excludes areas distributed prior to the effectivity of RA 6657 or the CARP Law. Integrated Social Forestry (ISF) Areas account for 26 percent or 130,440 hectares but this excludes areas that were issued Certificate of Community Forest Stewardship Contracts. Other lands subjected to CARP were 93,961 hectares of alienable and disposable lands, 88,659 hectares of government–owned lands, and 77.654 hectares of private agricultural lands distributed also accounts for 15.5 percent for Government-owned lands distributed include lands covered under the Kilusang Kabuhayan Kaunlaran (KKK) Program while private agricultural lands consist of foreclosed agricultural lands used as collaterals for loans in the government's financial institutions and CARP schemes like Voluntary Offer to Sell (VOS), Voluntary Land Transfer (VLT) and Compulsory Acquisition (CA). Under the Operation Land Transfer, about 13.5 percent or 67,777 hectares were also distributed. Most of the areas committed to CARP are found in the provinces of Isabela and Cagayan (***Table 44***).

f.2.3 Fishery areas

Marine and Coastal Resources

The region's fishery resources are continuously depleted due to illegal fishing practices and methods like the use of dynamites and blasting caps, electro fishing in inland waters, poisoning and the use of mesh nets. The use of illegal fishing methods had persisted even with the passage of Fisheries Code. Fisherfolks in municipal fishery areas contributed to the drastic decline in their fish harvest over the years. Overfishing was practiced with due disregard to the methods used and the present level or availability of resources. The LGUs' failure to institutionalize fishery ordinances and to enforce the penal provision of the Fisheries Code had directly affected coastal resource conservation. The present focus of fishery laws, rules and regulations is towards rehabilitation. Most of the region's marine sanctuaries were already damaged beyond repair. The increasing incident of encroachments and poaching in the municipal waters using methods and gears that are likewise destructive to the coral reefs and other marine habitats remains perpetrated.

Various species of marine life thrive along the coastal waters of Region 2. This is one of the reasons why big portions of its population reside along the region's coastal areas. Its 890 km. coastline makes it conducive for fishing endeavors. As such, majority of coastal residents generate their income from fishing and other fishery-related activities within the 22 towns found along the coast of Region 2. Many of its resources are found in mangrove areas and coral reefs (***Table 45*).**

Table 45. No of Coastal Municipalities, Barangays and Fisherfolk, Region 2 (as of 2000)

Province	No of Coastal Municipalities	No. of Coastal Barangay	No. of Fisherfolk
Batanes	6	29	1,903
Cagayan	12	85	19,665
Isabela	4	45	7,989
Total	22	159	29,557

Source: DENR, Region 2

Major Fishing Grounds

Cagayan Valley region enjoys a wide stretch of rugged coastlines. Its geographical structure provides the region a wealthy fishing ground. Tugged as the frontier of the north**,** Batanes is surrounded by rich natural fishing grounds, which include the South China Sea, Pacific Ocean and the Balintang Channel. Other Fishing Areas are also found in Batanes. These are located in Diora, Uyugan, Chadpidan, Valugan, Vasay, Sabtang and in Bashi Channel. These areas are classified as bays. Cagayan province is endowed with wealthy coastal resources. These can be found in Babuyan Channel, Balintang Channel and Pacific Ocean. Isabela province also enjoys a bountiful source of aquatic and marine resources from the Pacific Ocean. Aside from these sources, Bicobian Cove and Palanan Cove also provide wealthy fishing grounds for residents of Isabela. The succeeding table shows the region's ports and major fish landing sites (***Tables 46 and 47***).

The region's rich municipal fishing grounds are the frequent target of poaching by foreign fishing vessels and encroachment by local commercial fishing vessels. The wide stretch of the region's coastal area of 890 kilometers, make monitoring difficult. It is for this reason that there is a failure to strictly implement fishery laws due to limited physical capability of enforcement bodies/agencies. The antiquated facilities and patrol boats of the Philippine Coast Guard and the Philippine Navy are no match to the more advanced and faster fishing vessels used by foreign and local commercial fishing companies.

Table 46. Major and Minor Ports, Region 2

Province	Major Port	Minor Port	Location
Cagayan	Port of Aparri	-	Aparri
	Port of San Vicente	-	Sta. Ana
	Port Irene	-	Sta. Ana
Isabela	-	Divilacan Port	Divilacan
		Palanan Port	Palanan
Batanes	Port Batanes	-	Basco

Source: Philippine Port Authority (PPA)

Table 47. Major Fish Landing Sites, Region 2

BATANES	CAGAYAN	ISABELA
Basco : San Joaquin, Baluarte Bay, Chamarian	Aparri: Punta, Furugganan	Maconacon: Fely
Mahatao: Centro, Diora Bay, Maratay	Buguey : Centro, Minanga	Divilacan: Poblacion
Ivana : Radiwan Port, Tuhel San Vicente	Gonzaga:Batangan, Minanga	Palanan : Culasi
Sabtang: Centro Port, Sumnanga, Chavayan, Savidug, Nakanmuan	Sta. Ana : San Vicente, Palaui	Dinapigue: Dibolo
Uyugan : Centro Port, Itbud Imnajbu, Kayvaluganan	Sanchez Mira: Namuac, Masisit,	
Itbayat : Paganaman, Panumbatan, Chinapuliran Raile	Claveria: Taggat, Minanga	

Source: Philippine Port Authority (PPA)

Inland Fishery

The Cagayan River plays a vital role as an aquatic resource. Its 520 km river length makes it the longest river in the Philippines. The river traverses the five provinces of the region. It is the principal source of irrigation systems, hydraulic and fisheries operation. With an area of 3,030 hectares, various fish varieties such as ludong, aramang, eel, shrimp, mullet, catfish and mudfish can be caught from the river.

The aquaculture sector of the region, however, contributes only 12.09 percent of the total fishery production in 2002. The bulk of the fishery production comes from municipal fishery sector contributing 48.5 percent and commercial fishery sector at 37.9 percent. Since the introduction of aquaculture, Region 02's fisherfolk took advantage of its rich inland resources through propagating and culturing of freshwater species. As of 2000, a total of 6,161 hectares of land were converted into fishponds for aquaculture activities. A total of 4,727 hectares of freshwater resources were also utilized for fishery activities. A large portion of our inland resources comes from the 1,434 hectares of brackishwater. On the other hand, fishcage projects cover a total of 98 hectares.

Cagayan Valley is also endowed with other resources such as lakes and dams that can be developed in the future. Other resources from inland come from water impounded by 20 Diversion Dams covering an area of 267 hectares. There are also 59 Small Water

Impounding Projects which serve a total area of 1,653 hectares and 1,776 Small Farm Reservoirs for an area of 592 hectares. All this can contribute a considerable increase in aquaculture production when developed.

Aside from the Cagayan River, another major fishery resource is the Magat Dam. With a total area of 4,500 hectares, only about 450 hectares of it is allowed for establishment of fish cages. An average of five tons a day can be harvested from the 10,885 existing fish cages constructed in Magat Dam covering a total area of 66.58 hectares. The fish cages are operated by 963 individuals.

However, these resources are yet to be tapped and developed. Other regions supply fish requirements of the region. The lack of proper information dissemination on the economic benefits of aquaculture industry tapers adoption by the local communities that are proximate to these resources.

Table 48. Fish Production, Region 2 by Province: (as of 2001)

Location	No. of Operator	Area in Hectares	Production (Kg)
Cagayan	3,791	1,829.88	1,509,539
Isabela	3,959	780.03	1,481,822
N. Vizcaya	2,283	145.247	161,811
Quirino	1,264	132.36	313,467
TOTAL	11,297	2,887.517	3,466,639

Source: BFAR Region 2

Table 49. Other Aquaculture Resources, Region 2 by Province: 2001

Province	No. of SWIP	Area	No. of Diversion Dam	Area	No of SFR	Area	Total Area
Batanes	----	-----	----	----	10	3.3	3.3
Cagayan	23	707.2	9	174.0	677	225.7	1,106.9
Isabela	24	616.0	2	16.0	641	213.7	845.7
Quirino	3	59.6	1	5.0	162	54.0	118.6
N. Vizcaya	9	270.0	8	72.4	266	95.3	437.7
Region 02	59	1,652.8	20	267.4	1,756	592	2,512.2

Source: BFAR, R02

Projected Area Requirement for Fisheries

The land requirement needed for fisheries development in order to respond to the needs of the region's population for the next thirty years is about 3,000 hectares ***(Table 42).*** The present area devoted to fisheries production is 5,887 hectares which is sufficient enough to meet the present and future protein-fish requirements of the population. However, productivity remains low. While sufficiency level for the past three years show a gradual

improvement, the present production level can only meet 30 percent of the total population requirement. Most fish requirements are imported from other regions, especially Region 01 for its bangus. It was ironic that the region provides the bangus fingerlings to Pangasinan and imports them back at full-grown size commanding a much higher price. This scenario is now an accepted arrangement due to the limited area for bangus development. However, the region is now into tilapia production. For the past three years, tilapia provided the fish supply requirement of the region. Irrigation projects mostly dams and small impounding projects were transformed into fishponds. Other marine and aquatic resources (prawns, lobsters and crabs) were usually sold to other regions or Metro Manila where the price is twice or much more than when offered locally.

f.2.4 Production Forest

The region has 721,023 hectares of production forest or 43.33 percent of the total forest area. Cagayan registered the biggest with 269,948 hectares or 37.4 percent, followed by Isabela, Nueva Vizcaya, and Quirino covering an area of 209,237 hectares or 29.09 percent, 146,631 hectares or 20.34 percent and 94,708 hectares or 13.14 percent, respectively. The production forest is categorized as follows:

Community-Based Forest Management and Other Projects

The Community-based Forest Management Program consolidated all socially oriented projects of the Department of Environment and Natural Resources such as the Integrated Social Forestry projects, Forest Land Management Agreements, Socialized Forest Management Agreements, Community-based Forest Management Agreements and many other community-based forestry projects. Out of the total area covered by CBFMs in the region, Cagayan accounts for the biggest with an area of 116,546 hectares, followed by Isabela with 77,097 hectares **(*Table 50 and Figure 37*).**

On the other hand, the other projects includes the a) regular reforestation projects covering a total area of 79,006 hectares; b) Tree Farm Leases with a total area of 3,253 hectares; c) commercial forest resources reproduction covering a total area of 5,000 hectares and d) Industrial Forest Management Agreements with a total area of 24,144 hectares. The existing Timber Lease Agreements covering a total area of 91,816 hectares is also included under this category.

Table 50. Forestry Projects, Region 2 by Province
As of 1999 (in hectares)

Projects	Batanes	Cagayan	Isabela	Quirino	N. Viz.	Region 2
Forest Land area	13,130	515,482	579,819	254,868	301,469	1,664,768
Total CBFM Project	5,042	116,546	77,097	75,118	39,311	313,116
CFP	-	81,178	43,325	33,565	5,887	163,945
RRMP[2]	3,873	8,633	9,913	18,717	11,248	52,384
FLMA 1	138	1,580	2,180	2,469	3,483	9,850
FSP Loan II	-	2,070	1,835	1,786	3,994	9,686
ISF	1,031	23,085	19,854	18,580	14,699	77,251
SIFMA	-	17,243	10,334	1,868	19,944	49,569
PLAs	-	12,633	7,778	684	2,487	23,582
Watershed Projects[3]	-	13,850	5,594	3,630	32,110	55,184
Regular Refo.	3,643	21,731	6,948	3,555	43,129	79,006
Tree Farm Lease	-	780	962	42	1,469	3,253
Natural Tree Park	-	7,567	235,457	-	2,462	245,487
COMFRREP	-	1,500	2,700	800	-	5,000
Existing TLAs[4]	-	66,548	100,552	-	-	167,100
IFMA I&II	-	1,957	22,207	-	-	24,164
TOTAL	8,685	260,536	469,631	85,697	140,912	965,463

Source: DENR, R02

[2] 11,645 hectares is within A&D
[3] 6,011 hectares is within A&D
[4] 1,000 hectares is within A&D

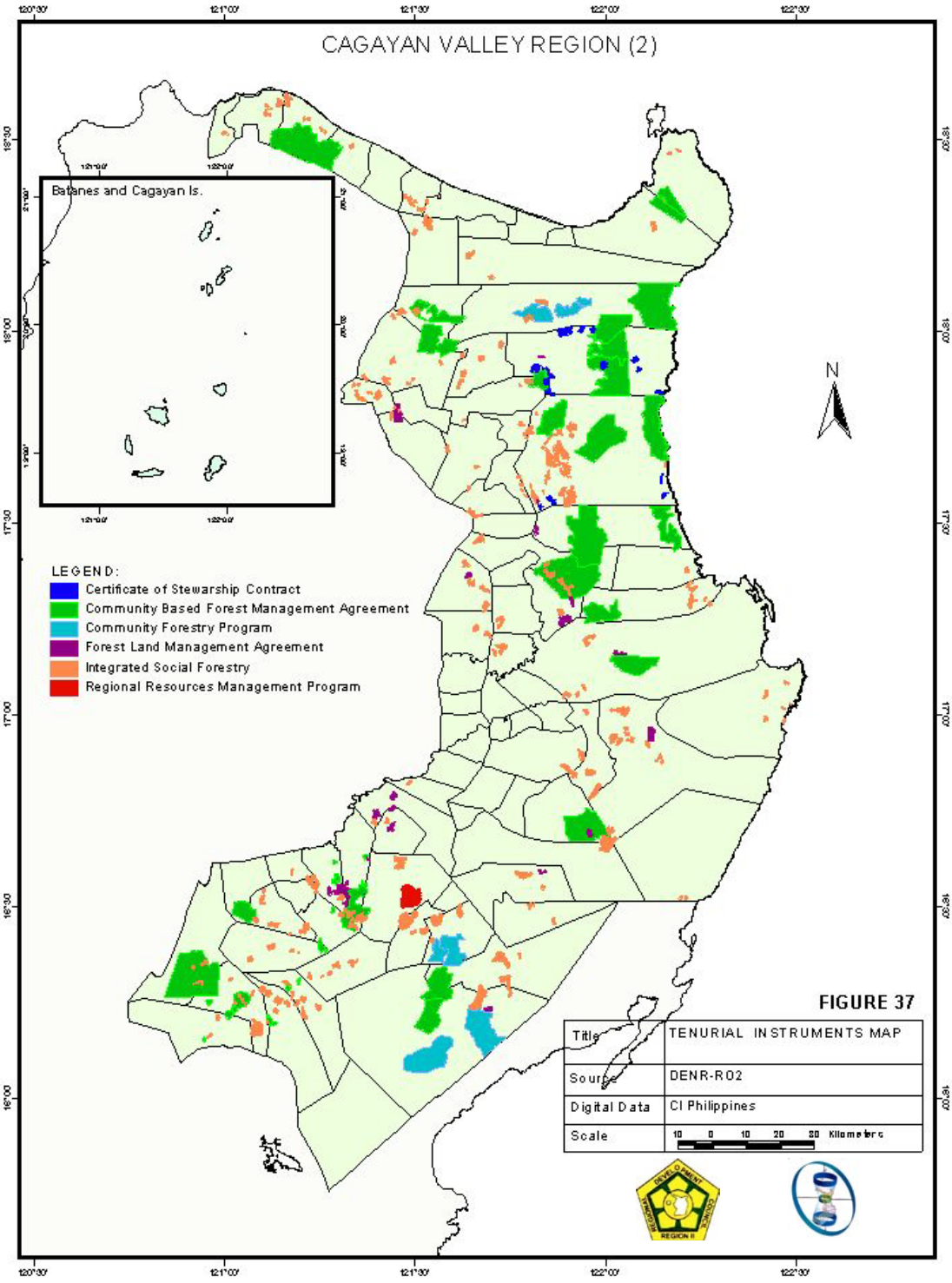


FIGURE 37: TENURIAL INSTRUMENT MAP

Grazing Lands

Original grasslands and brushlands of the region are more appropriate for forage pasture and grazing. Limited capital and peace and order problem in 70's and the 80's slowed down the utilization of these areas for livestock development. Grassland areas covered by proclaimed Protected Areas represent 20 percent of the region's total grassland area. The remaining 80% are located between the region's lowland and forested areas. Under existing policies and regulations, grasslands and/or grazing lands is still considered part of the forestland. The region's grassland area covered 376,670 hectares. Most of these grassland areas are idle and underutilized due to poor fertility. The grassland areas found suitable for pasture were leased to individuals or private entities for grazing. As of 1999, the area covered under pasture lease agreement is only about 28,217 hectares with 12,633 hectares mostly found in southern part of Cagayan province ***(Figure 38)***. Pasture Lease Agreements within critical watersheds in Nueva Vizcaya were not renewed upon its expiration in 2000. This was due to the perceived impact on the watershed rehabilitation effort in the province.

The present grassland and brushland areas were originally part of the forest area. The region's forest cover has gradually declined for the past 100 years. Among the factors that led to the diminishing forest cover and the expansion of the grassland is the burgeoning population that encouraged upland cultivation and logging activities. The inability to adopt soil fertility conservation measures led to nutrient depletion expanding the areas of grassland. Intensified land use in the areas of shifting cultivation led to shorter rest time for fallowing fields and ultimately to soil degradation and reduced crop yields. In the absence of restrictions in transient farming, unsustainable practices contributed to further deterioration that led to the expansion of grasslands and brushlands. It is for this reason that there is a wide expanse of unproductive grasslands in the region.

f.2.5 Mineral Land

The Sierra Madre Mountain Range is not only endowed with rich forest and water resources. It is where significant deposits of metallic and non-metallic mineral resources are concentrated. The ultramafic rock complexes in the Sierra Madre range are host rocks to chromite, nickel and other related deposits. Rich deposits of gold, silver, copper and white clay can be found in Nueva Vizcaya, Quirino and the southern parts of Isabela while iron deposits and related minerals are found along the northern coasts ***(Figure 39)***

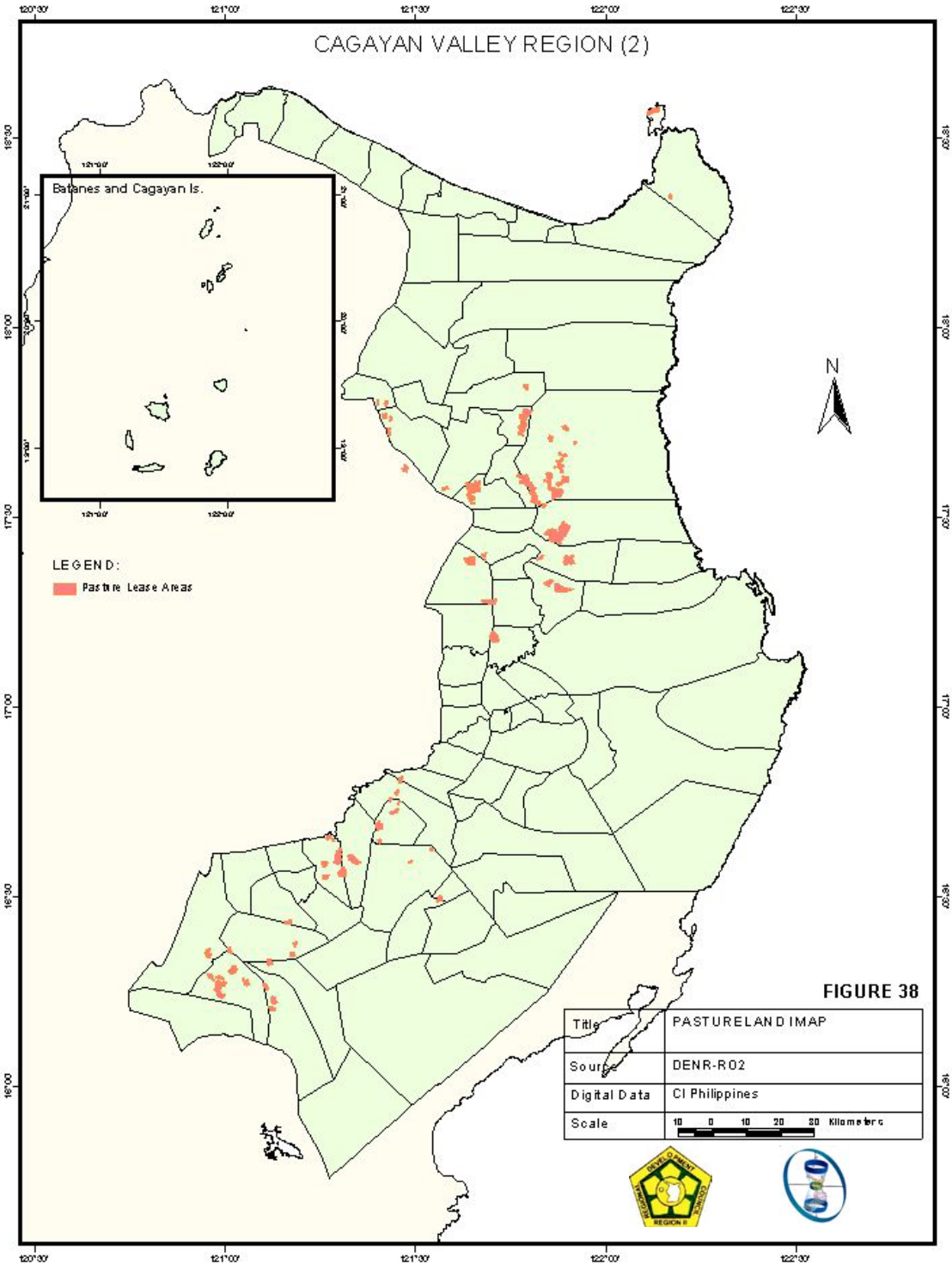


FIGURE 38: PASTURELAND MAP

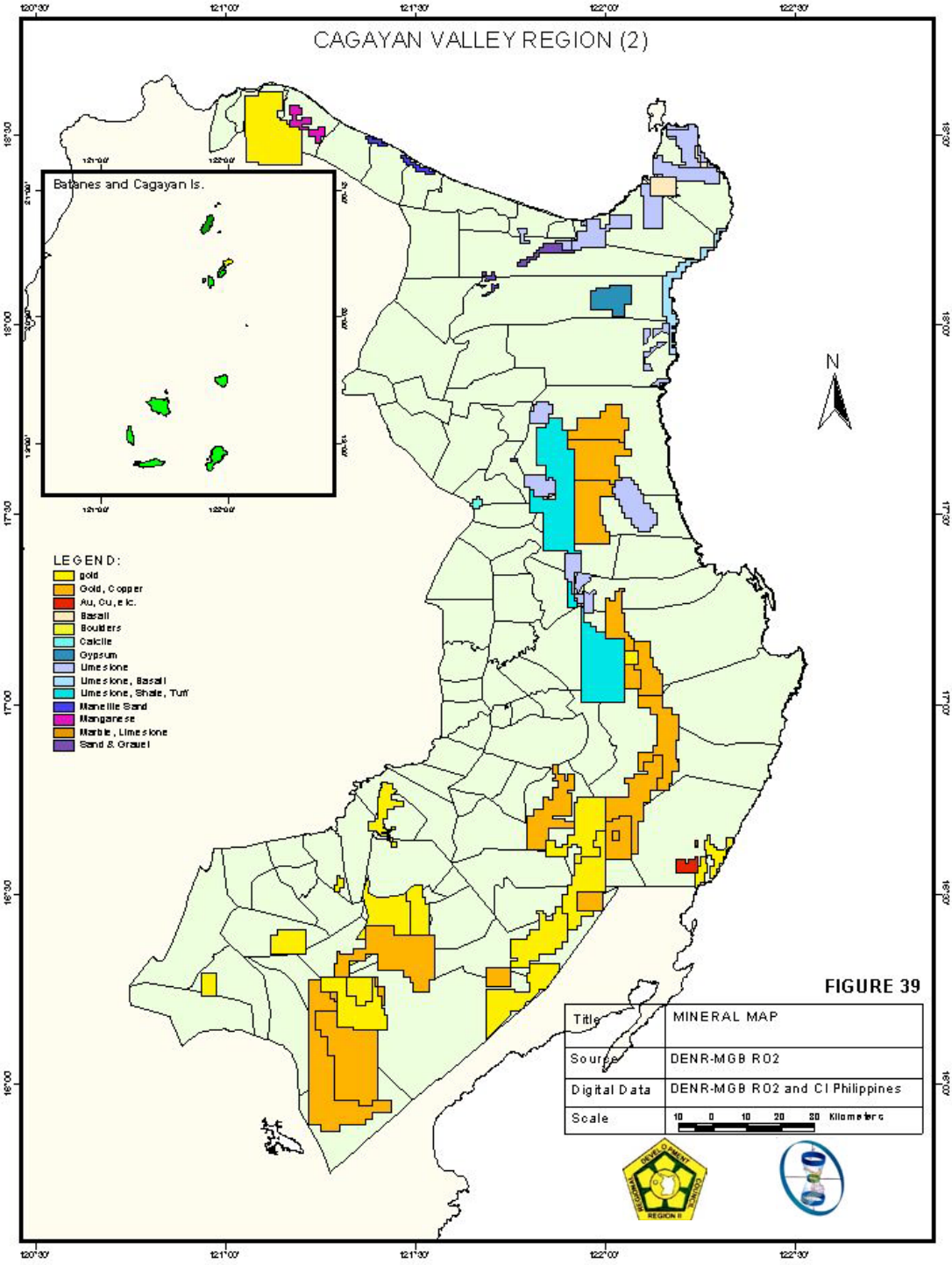


FIGURE 39: MINERAL MAP

Metallic Reserves

The region has an estimated volume of 218.289 Million MT of metallic reserves. About 98 percent of the metallic reserve consists of copper and gold. Other metallic reserves common in the region are iron and nickel with 1.2 Million MT and 5.0 Million MT estimated reserve, respectively. Most of these metallic ores are found underneath the regions protected forestland **(*Table 51*)**.

Non-Metallic Reserves

Total non-metallic mineral reserves are estimated at 1.439 Billion MT. The region is very rich in quartz diorite/diorite and limestone with an available estimated volume of 0.7 and 0.58 Billion MT, respectively (***Table 52***). Sand and gravel has an estimated volume of 81 Million MT, and it is the most commonly extracted among the listed mineral deposits. Total sand and gravel production is estimated at 3,279,394 cu. m. from 1997 to 2002, with an estimated sale worth PhP32.79 Million. This includes those that come from commercial and industrial sand and gravel operation.

Table 51. Estimated Metallic Mineral Reserves, Region 2, CY 2000
('000 Metric Tons)

MINERAL	TOTAL EST. RESERVE
Gold	106,000
Copper	106,000
Chromite	48
Iron	1,200
Manganese	41
Nickel	5,000
TOTAL	218,289

Source: DENR MGB 2

Table 52. Estimated Non-Metallic Mineral Reserves, Region 2, CY 2000
('000 Metric Tons)

MINERAL	TOTAL EST. RESERVE
Clay	12,124
Perlite	59,000
Sulfur	280
Diorite/Quartz Diorite	700,000
Limestone	587,000
Sand and Gravel	81,094
Guano	126

Source: DENR MGB 2

Mining Applications

As of October 2002, a total of 115 mining applications with an aggregate area of 710,697 hectares are under process and evaluation (***Table 53*)**. The minerals proposed for exploration and for Financial and/or Technical Assistance are mostly for gold, copper and silver while applications for Mineral Production Sharing Agreements are for various minerals such as gold, limestone, basalt, copper, nickel, chromite, calcite, manganese, white clay, sand and gravel and boulders.

Most mining applications are observed to be in conflict with other land uses and land classification. Areas considered part of a protected forest, CADC or biodiversity-rich areas are subjected to several mining applications. This conflict creates a deadlock on the issue on whether to allow mining in these areas or not. There are overriding policies for mining in the same way that other sectoral policies were promulgated raising legal questions.

Mining activities just like any developmental activity affect the environment and entail imbalance in the land, air and water. This is more highlighted when mine sites are abandoned and left unrehabilitated. Overlapping of land uses and mining rights

applications are also hampering expeditious processing of legitimate mineral contracts and permits due to non-standard and incorrect reference survey points.

Table 53. List of Mining Applications, Region 2
As of October 2002

MINING APPLICATION	NUMBER	AREA (Hectares)	MINERAL/S COVERED
Exploration Permit Applications (EPA)	33	335,609	Gold, Copper, Silver
Financial or Technical Assistance Agreement	6	225,292	Gold, Copper, Silver
Mineral Production Sharing Agreement (MPSA)	47	149,300	Gold, Limestone, Basalt, Copper, Nickel, Chromite, Calcite, Manganese, White Clay, Sand and Gravel, Boulders
Industrial Sand and Gravel (ISAG)	29	496	Sand and Gravel
TOTAL	115	710,697	

Source: DENR MGB 2

Nevertheless, the region is recognized for its vast deposit of metallic and non-metallic mineral resources. But these resources remain untapped and underdeveloped. The anti-mining sentiments of the local population have shifted mining exploration and other related activities to low gear, slowing down the region's mineral development. The opposition to mining is based on the founded fear of past mining disasters here and abroad. The fear that is associated to mining operations includes health and environmental hazards.

f.2.6 Industrial Development Areas

The region's industry sector lags behind agriculture and services sectors. It contributes a little more than 10% in the GRDP and reflects modest growth. Its modest performance can be attributed to the presence of small-scale and cottage industries operating in the region. These industries are usually concentrated in the region's urban areas, except for indigenous materials-dependent or resource-based industries, which are usually located in rural areas. Existing industries in the region have limited capital and operational capability. Industries in urban areas are scattered and usually mixed with other land uses making it more difficult to monitor and regulate.

There were efforts to realize the national objective of dispersing industry to the countryside through the identified Regional Agri-Industrial Centers (RAICs), The region has two identified RAICs, the Sta. Ana RAIC and the Cauayan RAIC. The two identified growth centers are expected to play a pivotal role in catalyzing and shaping growth in the region.

The Sta. Ana RAIC, located in Cagayan, sits on an 800-hectare of land. It is envisioned as the region's primary international industrial link owing to its being a component of the Cagayan Special Economic Zone Freeport (CSEZFP). On the other hand, the City of Cauayan is the host to the proposed Isabela Special Economic Zone (ISEZ) to be established in a 200-hectare portion of the SMC-owned Monterey Farms in Barangay San

Luis. The ISEZ is perceived to operationalize the originally proposed Cauayan Regional Agro-Industrial Center (CRAIGC). The ISEZ is recognized to further complement the operation of the Sta. Ana RAIC and CSEZFP which was created by virtue of RA 7922. The identified role of the CSEZFP as an international port of call and for the ISEZ as the agri-products and marketing center, justify a good linkage of the two centers.

The regional industry is currently dominated by micro, small and medium enterprises (MSMEs). Of the 7,532 enterprise registered as of 2003, only one is categorized as large enterprise the rest are MSMEs which are mostly into furniture (44%), food processing (18%), trading and services (18%), gift, toys and housewares (17%) and plants (3%).

2.7 Tourism Development Areas

Cagayan Valley is a showcase of natural attractions. Its natural beauty exudes admiration to nature-lovers and environment-conscious people. Aside from the man-made structures that draw tourist's attention, the region boasts of its verdant and scenic mountains, mossy forests, white and fine beaches, mystifying caves, splendid waterfalls, alluring hot springs/salt springs and enthralling rapids (***Table 54***). The region also has numerous national parks and wildlife sanctuaries that can be promoted for eco-tourism.

It is also home to religious and archeological sites that trace back Cagayan Valley's participation in molding the nation's history. The religious sites that are mostly old Spanish brick churches depict the settlement pattern of concentration near the banks of the Cagayan River, the region's primary access route during the pre-Spanish era. The region also boasts of the uniqueness of the indigenous culture. It also claims to have one of the earliest civilization developed in the Philippines.

Except for historical sites and religious sites, the region's natural attractions are not yet fully developed. Man-made structures , which are mostly located in built-up areas, can be restored or rehabilitated unlike natural attractions which require natural regeneration. Most of these areas have been the subject of neglect, outright disregard and unwarranted intrusion. At present, efforts are focused on the preservation and rehabilitation of the region's remaining old growth forest where these potential tourism areas are located.

Table 54. List And Location Of Areas With Outstanding Beauty, Region 02

NAME OF AREA WITH OUTSTANDING BEAUTY	LOCATION
BATANES	
1. White Beaches	Some Municipalities
2. Mt. Iraya	Basco
3. Nacabuang Caves	Basco
4. Valugan Bay	Basco
5. Bermuda Hills and Slopes	Basco
6. Radiwan Port	Ivana
7. Chawa Enchanted Caves	Mahatao
8. Diatay Beach and Waterfalls	Mahatao
9. Saroken Caves	Itbayat
CAGAYAN	
1. Callao Caves Resort /Mororan/ Pinacanauan River	Peñablanca
2. Bimmarangay River and Springs	Sta. Teresita
3. Claveria Surfing Beach	Claveria
4. Mabnang and Kilkiling Falls	Claveria
5. Taggat Falls and Lagoon	Claveria
6. Punta Lakay-lakay, Baket –baket	Claveria
7. Mapaso Hot Spring	Gattaran
8. Tanlagan Falls	Gattaran
9. Pinsal Falls/Zinundungan Valley	Lasam
10. Matara and Tanglag Beaches	Baggao
11. Abulug and Pamplona Rivers	Abulug/Pamplona
12. Malagababi Falls	Masi, Pamplona
13. Minanga Beach	Tabba, Pamplona
14. Maguburan Beach	Nagattatan/Abbangueran,Pamplona
15. Masisit Beach	Pamplona
16. Macatel Falls	Sanchez Mira
17. Mingay Beaches and Falls	Sta. Praxedes
18. Napudot Hot Spring	Sta. Praxedes
19. Fuga Island	Aparri
20. Batangan Beach	Aparri
21. Calayan White Beaches	Calayan
22. Ballesteros Beaches	Ballesteros
23. Sta. Ana Beaches	Sta. Ana
24. Buguey Resort Beach	Buguey
ISABELA	
1. Palanan Beach	Palanan
2. Palanan Rainforest	Palanan
3. Diminalno Lake	Palanan
4. Divilacan Beach and Bicobian Cove	Divilacan
5. Honeymoon Island	Divilacan
6. Maconacon Beach	Maconacon
7. Bonzai Forest	Dinapigue
8. Dinapigue Beach	Dinapigue
9. Digulo Falls	San Mariano
10. Sta. Victoria Caves and Fuyot Springs	Ilagan
11. Magat Hydroelectric Plant	Ramon
12. Mandadamian Water Falls	Echague
13. San Miguel Caves	Echague

NAME OF AREA WITH OUTSTANDING BEAUTY	LOCATION
NUEVA VIZCAYA	
1. Nabubungan Caves	Ambaguio
2. Mt. Pulog National Park	Ambaguio
3. Matuno River Rapids	Ambaguio
4. Salinas Hot Spring	Bambang
5. Pinsal Falls	Villaluz, Bambang
6. Uddiawan Falls	Solano
7. Viernes Falls	Paitan, Bayombong
8. Nuestra Sra. Falls	Palali Range, Bayombong
9. Perez Park	Sta. Fe
QUIRINO	
1. Aglipay Caves	Polician, Aglipay
2. Nagbukel Caves	Ajel, Diffun
3. Picnic Site	Abbag, Nagtipunan
4. Governor's Rapids	Nagtipunan

Source: DOT-Region2 Tourism Master Plan

f.3 Sustainability of Land Use

Sustainability analysis was done primarily to determine the viability and sustainability of the present or existing land use in the region. The existing land use (***Figure 40***) was assessed vis-à-vis soil suitability (SAFDZ and NPAAAD) and the result of the analysis was the soil sustainability which delineated the three sustainability categories, namely Sustainable Land Use, Under-Used Land and Over-Used Land as shown in Tables 58 and 59 respectively.

The region has a total sustainable area of 1,595,055 hectares for which the province of Isabela and Cagayan accounts for 43 percent and 33 percent. Sustainable land use means a form of use that can be continued on into the future with the same level of productivity, but also with no deterioration of the land resource. If land use is in accordance with the sustainability of the land for that form of use, then that is described as "sustainable" land use. For instance, areas classified as agricultural lands under the existing land use which are also identified and delineated as part of the remaining NPAAAD or as Strategic Crop Sub-development Zone are classified as sustainable in use.

The region has about 26 percent of under-used areas or about 704,963 hectares. Most of the underused areas are grassland areas. These include lands being used at a level of intensity that is below the intensity it is suitable for (e.g. Areas that are presently classified as grassland or shrubland areas but more suitable for agricultural crops production). These areas are considered development opportunity areas considering the need to align its present use to its more sustainable use.

On the other hand, the region has a total overused land of 347,732 hectares. Over-used lands include those used a level of intensity that is in excess of its suitability of use, e.g. presently used for agricultural crops production but it is more suitable for fishery production purposes. These areas are considered not sustainable in its use.

Table 55. Sustainability of Land Use: Region 2

Province	Sustainability of Land Use		
	Sustainable	Overused	Underused
Batanes	7,232	7,528	5,395
Cagayan	523,709	103,750	238,388
Isabela	687,832	118,871	238,541
N. Vizcaya	184,592	99,713	151,423
Quirino	191,691	18,411	80,130
TOTAL	1,595,056	348,273	713,877

Source: Overlay of SAFDZ map and existing land use map

f.3.1 Sustainable Areas

The region has approximately 1,595,056 hectares of sustainable areas, representing 60 percent of the total land area of the region. This means that a significant area of the region is being employed to its most suitable and appropriate use as shown in Table 58.

The province of Isabela has the largest sustainable area, which accounts for 43 percent of the total sustainable area of the region. Cagayan shares about 33 percent while Quirino and Nueva Vizcaya has a 12 percent share each, respectively (***Table 56***).

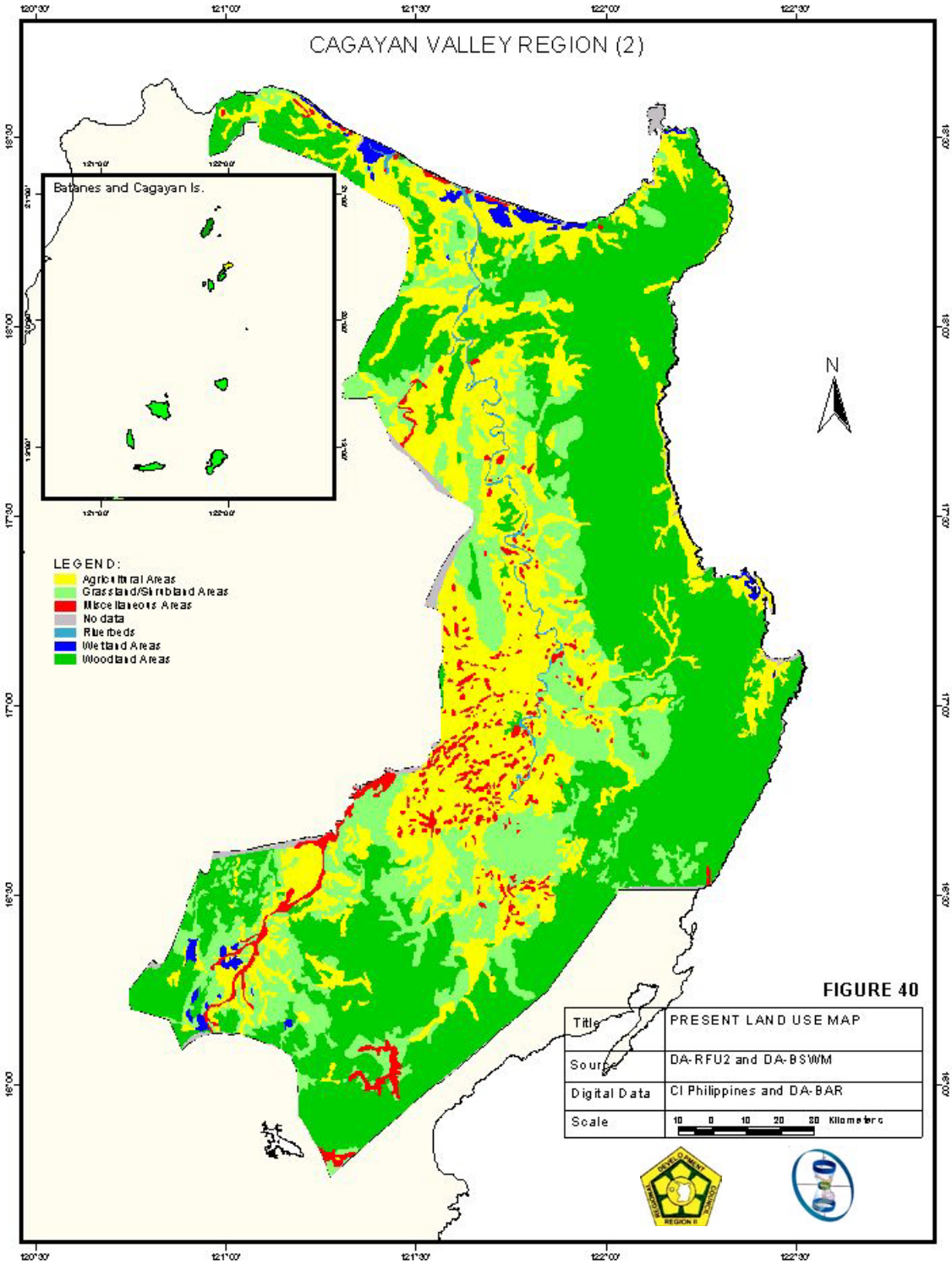


FIGURE 40: PRESENT LAND USE MAP

Table 56. Sustainable Areas: Region 2

SAFDZ Categories	Provinces					Total
	Batanes	Cagayan	Isabela	Nueva Vizcaya	Quirino	
Agro-Forestry	379.4	4,703.0	13,129.6	15,968.4	12,431.2	46,611.6
Rem. NPAAAD	529.2	23,128.0	22,982.4	3,141.4	2,714.7	52,495.7
Crops	1,545.3	140,483.2	243,604.0	27,605.4	19,948.9	433,186.8
Fisheries	-	5,734.5	-	-	-	5,734.5
Livestock	1,844.8	-	29,074.9	18,766.0	7,154.3	56,840.1
Crop/Fisheries	602.5	102.6	-	-	-	705.1
Crop/Livestock	-	-	-	824.0	-	824.0
Fishery/Livestock	-	722.7	-	526.0	-	1,248.8
Watershed/Forestry	2,330.3	348,835.6	379,040.6	117,760.6	149,441.5	997,408.5
Total	7,231.6	523,709.6	687,831.5	184,591.8	191,690.6	1,595,055.1

Source: Overlay of SAFDZ map and existing land use map

f.3.2 Underused Areas

For underused land, the region has a total of approximately 719,272 hectares as shown in Tables 57 and 58. These areas serve as the region's development opportunity zones. These areas are not fully utilized or its production or service functions are not optimized. The present land use makes the land less productive than its proposed use. Underused grasslands and shrublands accounts for 63 percent of the total underused areas or about 454,953 hectares. There is also 205,472 hectares of underused woodland areas including 25,860 hectares of riverbed and 22,329 hectares of wetland areas.

Table 57. Under-used Areas: Region 2

SAFDZ CATEGORY	LAND USE CATEGORY							
	Agric'l Areas	Grassland/ Shrubland Areas	Wetland Areas	Woodland Areas	Misc. Areas	Un-classified	Riverbed	TOTAL
Agro-Forestry	-	71,494	2,792	33,690	1,263	239	583	110,061
Perm. NPAAAD	-	109,059	14,609	30,936	-	147	896	155,647
Crops	-	131,701	2,235	48,515	-	151	11,345	193,947
Fisheries	-	399	-	954	-	1	8	1,362
Livestock	-	17,342	1,549	52,149	-	735	2,254	74,029
Crop/ Fisheries	-	49	-	-	-	-	-	49
Crop/ Livestock	-	1,255	-	973	-	-	-	2,228
Fishery/ Livestock	-	8,803	-	4,259	483	216	1,401	15,162
Watershed/ Fishery	-	112,835	1,151	-	-	3,492	6,922	124,400
No Data	278	2,018	-	306	-	3,651	2,450	8,703
Riverbed	-	-	-	33,690	-	-	-	33,690
TOTAL	278	454,955	22,329	205,472	1,746	8,632	25,859	719,272

Source: Overlay of SAFDZ map and existing land use map

Most of the underused areas are identified more suitable for Strategic Crop Sub-Development for a total area of 193,497 hectares. Of this total area, about 131,700 hectares are existing grassland and shrubland areas in addition to the 48,515 hectares of woodland areas that can serve best as an expansion area for agricultural production.

Table 58. Underused Areas, Region 2 by Province (in hectares)

Land Use Category	Batanes	Cagayan	Isabela	Nueva Vizcaya	Quirino	Region 02
Agricutural Areas	278	-	-	-	-	278
Grassland/Shrubland Areas	392	109,253	194,748	92,325	58,236	454,954
Wetland Areas	-	14,443	1,745	6,141	-	22,329
Woodland Areas	4,725	100,951	27,358	52,290	20,149	205,473
Miscellaneous Areas	-	-	-	-	1,746	1,746
Unclassified	-	-	7,966	667	-	8,633
Riverbed	-	13,741	6,725	-	-	20,466
TOTAL	5,395	238,388	238,542	151,423	80,131	719,272

Source: Overlay of SAFDZ map and existing land use map

f.3.3 Overused Areas

On overused lands, the region has approximately 347,732 hectares within the different existing land uses (***Tables 59 and 60***). These areas have more appropriate use than its present state of use to optimally enhance its production and service function. Most of the region's existing agricultural production areas reflect most of the overused lands. There are 220,204 hectares presently used for agricultural production that are best fit for agro forestry – 32,577 hectares, watershed and forest – 89,033 hectares, livestock development – 50,874 hectares and fishery/livestock development– 29,348. Most of these areas are marginal but utilized for prime crops or high-value crops production.

Other overused lands are miscellaneous areas with a total area of 75,972 hectares, unclassified areas of 47,356 hectares and grassland and shrubland areas of 4,121 hectares. Most miscellaneous areas are usually devoted for settlements and infrastructure development. Most of the lands converted to residential, industrial infrastructure and facilities development are prime agricultural lands. This results to irreversible conversion reclassifying the use of the land.

Table 59. Summary of Over-used Areas: Region 2

SAFDZ Categories	I. Land Use Categories					
	Agricultural Areas	Grassland/ Shrubland Areas	Wetland Areas	Woodland Areas	Misc. Areas	Unclassified
Agro-Forestry	32,577.1	1,333.8	-	-	3,023.2	91.4
Rem. NPAAAD	-	-	78.7	-	3,750.5	1,317.4
Crops	-	571.4	-	-	39,463.8	1,509.8
Fisheries	4,517.5	-	-	-	4,678.9	234.1
Livestock	50,874.3	-	-	-	3,898.8	264.4
Crop/Fisheries	788.9	-	-	-	-	-
Crop/Livestock	-	-	-	-	21.9	325.6
Fishery/Livestock	29,348.9	38.6	-	-	9,763.9	514.4
Watershed/Forestry	89,033.1	2,178.0	-	-	9,782.3	38,794.0
No data	5,097.6	-	-	-	1,098.1	4,304.5
Riverbed	7,966.8	-	-	-	490.5	-

Source: SAFDZ map and BSWM map overlay

Table 60. Overused Areas, by Province (in hectares)

Land Use Category	Batanes	Cagayan	Isabela	Nueva Vizcaya	Quirino	Region 02
Agricutural Areas	2,830	90,987	72,802	39,103	14,482	220,204
Grassland/Shrubland Areas	4,122	-	-	-	-	4,122
Wetland Areas	-	79	-	-	-	79
Woodland Areas	-	-	-	-	-	-
Miscellaneous Areas	35	7,843	46,070	18,095	3,929	75,972
Unclassified	-	4,842	-	42,514	-	47,356
Total	6,987	103,750	118,872	99,713	18,411	347,733

Source: SAFDZ map and BSWM map overlay

G. INFRASTRUCTURE

g.1 Transportation

Region 2 is geographically landlocked and is relatively distant from Metro Manila and other primary industrial areas of the country. The mountain ranges along the region's periphery pose as barriers for easy access to the other regions of the country and vice versa. With this general physical characteristic, the development of the transportation sub-sector needs preferential attention in order to establish an efficient transportation network necessary for a globally competitive economy.

The region lacks adequate access roads to link remote municipalities especially in the coastal areas and the hinterlands to the market centers. This situation confirms the fact that the region's road density of only 0.48 km. per square kilometer of land area that is lower than the national average of 0.67 km. per sq. km. of land area. Earth and gravel roads comprise 38 percent of the total length of national roads, most of which are frequently washed out during landslides caused by heavy rains.

g.1.1 Land Transport

National Access Roads. Even with the completion of the rehabilitation of *Allacapan-Aritao Road* (*Maharlika Highway*), improvement of Santiago-Enrile Road (west of Maharlika Highway), improvement of *Laoag-Allacapan Road* (or *Manila North Road* along northwest Cagayan), and improvement of the *Dugo-San Vicente Road* (which links the *Cagayan Special Economic Zone* at Sta. Ana, Cagayan to the region's northern trunk-line route), the region still remains relatively deficient of safe and reliable access roads that would link isolated and/or remote communities to the mainstream of economic activities. This is shown in the region's road density of 0.48 km./ sq. km., which is lower than the national average road density of 0.67 km./sq. km in CY 2001 (***Table 61***).

Table 61. Road Density, Philippines and Region 2: 1994, 1997, and 2001

ROAD DENSITY *(Km/Sq. Km. of total land area)*	YEAR		
	1994	1997	2001
REGION II	0.42	0.46	0.48
PHILIPPINES	0.54	0.54	0.67

Source: DPWH R2

While major strategic roads that include the east-west laterals (*Gattaran-Bolos Pt. Road* east of Cagayan, *Bayombong-Ambaguio Road* east of Nueva Vizcaya, and *Piat-Tuao-Pinukpuk Road* west of Cagayan), and inter-regional roads (*Aritao-Benguet Road* east of Nueva Vizcaya and *Maddela-Aurora Road* east of Quirino) were opened, the region continues to rely on *Maharlika Highway* as its main exit and entry point from the South, and the *Laoag-Allacapan Road* from the North. Furthermore, the mountain sections of these trunk-line routes are highly vulnerable to slope erosion or landslides, thus, are prone to traffic closure.

The deterioration and the destruction of roads and other infrastructures due to long rainy seasons, frequent typhoons, and seismic activities (*the region is geographical located*

within the "Digdig fault" in North Luzon) need to be controlled. Investments for national road development during the recent years focused on the (1) improvement and rehabilitation of existing road sections and (2) replacement or reconstruction of dilapidated bridges along major traffic routes. These efforts need to be sustained for longer project life of road infrastructures. This is also to improve the status of national roads where only about 44 percent are concrete - paved as of CY 2001 (***Table 62)***.

Table 62. National Roads By Surface Type, By Province
As of CY 2001 (Length in Kms.)

	CONRETE		ASPHALT		GRAVEL		TOTAL	
	Length	% Share	Length	% Share	Length	% Share	Length	% Share
Batanes	13.208	15.809	23.998	28.724	46.341	55.467	83.547	100.00
Cagayan	407.537	63.339	60.116	9.343	175.768	27.318	643.421	100.00
Isabela	240.640	53.922	143.116	32.069	62.519	14.009	446.275	100.00
N. Vizcaya	97.918	26.955	51.713	14.236	213.627	58.809	363.258	100.00
Quirino	30.264	11.883	48.328	18.976	176.088	69.141	254.680	100.00
REGION II	789.567	44.081	327.271	18.271	674.343	37.648	1,791.181	100.00

Source: DPWH R2

g.1.2 Air Transport

National Airports. Region 02 has 4 public airports in operation, namely, *Tuguegarao, Cauayan, Basco*, and *Bagabag* Airports. Table 63 shows the classification and important roles of these airports. These national airports operating in the region require further improvement or upgrading in order to accommodate bigger aircrafts and to enable night landing especially in times of emergency. Airport development that has been done to meet the minimum requirements of the *International Civil Aeronautics Organization (ICAO)* during the past decade was limited to peripheral improvements. The establishment of airports particularly in Sta. Ana, Cagayan to support the Cagayan Special Economic Zone and Free Port (CSEFP) and in the island municipalities is also needed in order to attain the envisioned tri-modal transport system.

Table 63. List of National Airports, Region 2

NAME/ LOCATION	CLASSIFICATION	STRATEGIC ROLE
Tuguegarao Airport	Secondary	Services the region's institutional center
Cauayan Airport	Tertiary	Caters to air transport needs of commercial centers in Isabela
Basco Airport	Tertiary	Provides air transport for the province of Batanes
Bagabag Airport	Tertiary	Alternative inter-modal transport for the region and CAR

Source: Air Transport Office, Region2

Private Airports. Meanwhile, an airstrip that was constructed along the eastern coast of Palanan, Isabela by the ACME logging concessionaire is currently used by private aircrafts for commercial operation (*The ACME Wood Industry Inc. ceased operation in 1996).*

Due to the growth of residential, commercial and other land uses within the vicinity of existing airports, their potential for expansion and improvement becomes limited.

g.1.3 Sea Transport

The open sea attribute of the region and its proximity to other East Asian countries offer a significant potential for the development of maritime sea transport industry in Northern Luzon. At present however, the region's sea transport facilities need further development to effectively cater to the transportation requirements of island and coastal municipalities.

National Ports

Despite its maritime potential, a fully developed major port in the region remains wanting. Efforts of the sub-sector during the past decade were limited to maintenance activities of the existing Aparri Port and Sta. Ana Port in northern and northeastern Cagayan, respectively.

Municipal Ports

Existing ports in the coastal towns of Aparri, Cagayan and Palanan, Isabela should be developed further to optimize their utilization in support to the region's agro-industrial development.

Meanwhile, the group of islands in Batanes is isolated from the mainland's economic activities due to inefficient sea transport facilities. The Philippine Navy's *Landing Ship Tank (LST)* calls on the island-province barely four times a year. Aside from this courtesy from the PN, two maritime vessels owned by the local cooperative in the province are providing transport for the Ivatans and their goods. However, reliability of these vessels on their sea-worthiness considering the rough waters in the Babuyan Channel of the *China Sea* cannot be fully ascertained.

On the other hand, the island-municipality of Calayan depends on motorized *bancas* as transport service to and from the coastal municipalities of Claveria and Aparri in northwestern and northern Cagayan, respectively. Calayan is around 45 nautical miles north of Aparri has a land area (508.60 sq. km.) greater than Batanes (209.3 sq. km.)

Apart from the unpredictable and usually adverse weather condition in the Babuyan Channel, the absence of more efficient and reliable municipal ports and docking areas of the existing local ports render sea travel difficult and risky.

g.2 Water Resources

g.2.1 Irrigation

The region's water resources have a comparative advantage over the other regions of the country. Specifically, the Cagayan River Basin, with the Cagayan River as the longest in the country, has the largest drainage area of 27,300 square kilometers. Despite the region's abundant water resources however, its irrigation coverage merely stands at 46.54 percent or 219,988 hectares out of 472,640 hectares of potential irrigable lands in the region as of CY 2001 (***Figure 52 and Table 64***).

Due to dearth of project fund allocations, the rate of increase of irrigation development in the region for the last five years was limited to an average of 0.85 percent per annum. This is significantly less than the target annual average rate of increase of 1.21 percent that is 5, 739 hectares of new service areas to be generated annually. Furthermore, a significant number of national and communal irrigation systems remain inefficient and ineffective that limits the region's agricultural productivity. These irrigation facilities are in dire need of rehabilitation due to (1) perennial effects of natural calamities, (2) poor maintenance by the irrigators' associations (IAs), and (3) significant decrease of run-off water during the dry season because of forest denudation.

Table 64. Status of Irrigation Development, Region 2: By Province
As of CY 2001 (in Hectares)

PROVINCE	POTENTIAL IRRIGABLE AREA	IRRIGATED	% IRRIGATED
Batanes	3,670	104.70	02.85
Cagayan	143,610	73,760	51.36
Isabela	252,870	109,810	43.43
N. Vizcaya	48,520	27,937	57.58
Quirino	23,970	8,376	34.94
REGION 02	472,640	219,988	46.54

Source: NIA R2

National Irrigation Systems

There are 17 operational national irrigation systems (NISs) in the region with an aggregate irrigation service area of 134,758 hectares ***(Table 65)***.

The Addalam River Irrigation Project (ARIP), an NIS project, is undergoing construction in Saguday, Quirino. The project irrigates an aggregate area of 5,830 hectares of farmlands in the municipalities of Saguday and Aglipay in Quirino; and Echague and Jones in Isabela.

Meanwhile, the Upper Chico River Irrigation System (UCRIS) that has been operating in 1986, and administered by NIA Cordillera Administrative Region (CAR), irrigates a total of 8,510 hectares of farmlands in Mallig (3,200 has.) and Quezon (5,310 has.) in Isabela. The total irrigation service area of the UCRIS is 15,311 hectares. It irrigates the remaining 6,801 hectares in Tabuk (6,655 has.) and Pinukpuk (146 has.) in Kalinga province of CAR.

Major foreign-assisted multi-purpose water and power projects.

The Casecnan Multi-Purpose Irrigation and Power Project or CMPIPP) is on-going. The project diverts the waters from the Cagayan River to the *Pantabangan Dam* in the province of Nueva Ecija in Region 03. This will irrigate the farmlands of Dupax del Sur, Dupax del Norte and Alfonso Castañeda in Nueva Vizcaya, and Nagtipunan in Quirino and also generate about 140 megawatts of electricity that would that would support the power requirements of Luzon. With the implementation of the project, the provinces of Nueva Vizcaya and Quirino are directly benefited in terms employment, economic and other livelihood opportunities.

Local/Communal Irrigation Systems

The continuing development of communal irrigation systems (CISs) is adopted as one of the top priorities of the sub-sector to support areas not covered by national irrigation projects (e.g., in remote and/or island communities). The CIS program of the NIA gives primary consideration to self-sufficiency in rice rather than to the project's economic viability.

Small Water Impounding Projects

The region is endowed with several lakes and reservoirs. Among the identified priorities for development is the Small Water Impounding Program (SWIP) of the Department of Agriculture that supports the irrigation and inland fishery programs of the government. The strengthening of this program in the region could achieve the optimum utilization of these lakes and reservoirs for agricultural production. Moreover, the uncontrolled and unwarranted economic activities and population pressure on watershed areas have also significantly compounded flooding in the lowland.

Table 65 IRRIGATION DEVELOPMENT, Region 2: As of December 31, 2003

PROVINCE	POTENTIAL AREA FOR IRRIGATION (Has.)	IRRIGATION SECTOR	NUMBER OF SYSTEM	SERVICE AREA, (Has.)	IRRIG. DEVELOP-MENT (%)
REGION 2	472,640	NIS	17	141,600	47.90%
		CIS			
		A	1,046	32,475	
		B	2,983	23,883	
		C	2,661	28,444	
Grand Total			6,707	226,402	
BATANES	3,670	NIS			4.30%
		CIS			
		A	41	146.70	
		B	2	11.00	
		C	-	-	
Sub Total			43	157.70	
CAGAYAN	143,610	NIS	11	37,462	50.70%
		CIS			
		A	473	14,470	
		B	1,023	10,451	
		C	1,391	10,426	
Sub Total			2,898	72,809	

PROVINCE	POTENTIAL AREA FOR IRRIGATION (Has.)	IRRIGATION SECTOR	NUMBER OF SYSTEM	SERVICE AREA, (Has.)	IRRIG. DEVELOP-MENT (%)
ISABELA	252,870	NIS	5	99,194	46.53%
		CIS			
		A	313	7,879	
		B	1,917	7,786	
		C	721	2,799	
Sub Total			2,956	117,658	
QUIRINO	23,970	NIS*	-	2,784	34.67%
		CIS			
		A	102	4,383	
		B	12	393	
		C	68	751	
Sub Total			182	8,311	
NUEVA VIZCAYA	48,520	NIS	1	2,160	56.61%
		CIS			
		A	117	5,596	
		B	29	5,242	
		C	481	14,468	
Sub Total			628	27,466	

Source: National Irrigation Administration Region 2

Note: Exclusive Service Area of Ifugao, MARIIS=575 Has. and Service Area of Apayao, AAIS=2,818 Has.

* = Area under MARIIS

A = NIA Assisted/Constructed

NIS = National Irrigation System

B = Constructed by Other Agency

CIS = Communal Irrigation System

C = Privately Owned System

g.3 Flood Control Drainage

Water Resources Development Directions

With the attendant dangers posed by the mighty *Cagayan River* and its major tributaries, the Cagayan River Basin Water Resources Development Program (CRBWRDP) Master Plan was completed in 1987 to serve as the framework for the water resource development of the region. It recommended the implementation of various flood control schemes for the short-term and long-term plan periods.

Flood Control

The short-term plan component of the CVWRDP master plan emphasized the urgency of the *Lower Cagayan River Flood Control Scheme and Bank Protection.* However, more than a decade after the completion of the study, the inundation of the low lying or flood prone areas of the region still remains a perennial problem. This is adversely affecting agricultural production particularly in the provinces of Isabela and Cagayan. This is because the implementation of the needed flood control and bank protection structures in the past was *piece-meal* (e.g., minimal annual allocation) primarily due to financial constraints.

With the completion of the *Lower Cagayan River Flood Control Project Feasibility Study* in December 2002, through the JBIC grant program, the implementation of the recommended structural measures to flooding and bank erosion in the affected areas shall be accelerated.

Dams

High dams or water reservoirs also serve as potential structural flood control facilities or mitigating measures but its implementation is hampered by aversion to these structures of the local populace within identified project areas.

g.4 Power and Electrification

Power Generation

The region is endowed with energy potentials such as coal, geothermal and hydro thermal especially in the provinces of Cagayan and Isabela. Coal reserves are present in Isabela and Quirino while geothermal resources in northern Cagayan have been found to have ample potentials for power generation.

Despite these significant electric power-generating natural endowments, there is only one operating hydrothermal plant in the region - the *Magat Hydroelectric Power Plant* in Isabela which has an installed capacity of 360 megawatts. However, said power plant is not operating at its full capacity due to forest denudation and silting of the upper area of the *Magat River.*

Rural Electrification

As of CY-2001, the region's electrification/energization at the municipal level is 100 percent, barangay energization is 81.81 percent (1,940 out of 2,408 potential barangays), and household energization is 69.79 percent (349,903 out of a potential of 519,982 households) as shown in **Table 66.**

The sub-sector is constrained by limited sources of funds for the expansion of distribution lines. The electric cooperatives likewise find it unprofitable to energize far-flung communities with widely scattered households. The *National Electrification Administration (NEA)* extends its M*issionary Electrification Program* to respond to this limitation of electric cooperatives in the country.

Efforts should be mustered to further accelerate the complete energization of the remaining potential barangays in order to attract more investments in the countryside.

Further, there is a need to improve the efficiency of power transmission and distribution to consumers. The constant high systems losses in power transmission and distribution resulted to high power rates, which have been continuously burdening the consumers. Poor maintenance and overloading of distribution lines often result to low power voltage and frequent power outages.

g.6 Communications

Communication services are increasingly becoming the major determinant to the regional economy and the private sector is expected to play a major role for its development.

Postal Services

Postal service is widely preferred as a means of transmitting mails especially in the less developed areas of the region. As of CY-2000, there are 102 post offices and postal stations distributed among the 5 provinces of the region. Of these, 72 percent are located in the provinces of Cagayan and Isabela.

Table 66. Status of Energization, Region 02 By Province
As of CY 2001

PROVINCE	POTENTIAL COVERAGE	ENERGIZED (Number)	% ENERGIZED
REGION 02			
Municipalities	97*	97*	100.00
Barangays	2,408	1,970	81.81
Connections	522,982	364,977	69.79
Batanes			
Barangays	29	29	100.00
Connections	3,159	3,123	99.00
Cagayan			
Barangays	900	718	79.78
Connections	188,037	127,292	67.70
Isabela			
Barangays	1,053	890	84.52
Connections	233,203	169,392	72.64
N. Vizcaya			
Barangays	275	202	73.00
Connections	67,182	44,094	65.00
Quirino			
Barangays	151	131	87.00
Connections	30,771	21,076	68.00

Source: NEA R02

Based from the planning standard of one (1) post office per municipality, the region has adequate post offices/postal stations. However, there are only 15,206 persons being served by 1 letter carrier, way below the national standard of one (1) letter carrier for every 500 population.

In terms of the quality of service, postal delivery in the region is still deemed inefficient. Late mail deliveries are very common especially in the rural areas where mails take days to reach the addressees.

Telecommunications

As of 2000, the region's telephone density of 1.13 persons per telephone installed is one of the lowest among the regions in the country (***Table 67)***. This figure is way below the national average of 12 persons per telephone line installed. The provision of telecommunication services is concentrated in the relatively urban areas where public investment is profitable.

The OECF-assisted Regional Telecommunications Development Project (RTDP) of the DOTC that was completed in CY2000 is not efficiently functioning under the interim operation of the TELOF Region 2. This is because the DOTC has not as yet responded and approved on the need for additional funding and manpower to be allocated to TELOF Region 02 for the full operation of the existing facility. As a result, the remote and far-flung municipalities cannot yet be efficiently reached with the use of the RTDP.

On the other hand, telecommunications has achieved a significant headway along private sector initiated expansions. As of CY-2002, three (3) local exchange carriers (e.g., *PLDT, DIGITEL, and ETPI*) are operating in the region, having an aggregate of 38,882 installed lines. The number of subscribers is 32,184 or 82.77 percent of the total installed lines (of 38,882).

Local Telecommunications

Meanwhile, all municipalities are provided with facilities of the *Government Emergency Telephone System (GETS)* that is linked to Manila. This facility, however, is for emergency use only and not generally accessible for use by the public. To fill in this development gap, the *Municipal Telephone Program* of the DOTC provided 42 municipalities not served by the existing exchange carriers with public calling stations.

Current Telecommunications Development

Aside from the OECF-assisted Regional Telecommunications Development Project (RTDP) of the DOTC being operated by DIGITEL, Inc., other private mobile telephone companies (SMART, Globe, etc.) are now gaining business grounds in the region.

Corollary to the government's privatization policy, the operation and maintenance of the recently completed state-of-the-art *Regional Telecommunications Development Project (RTDP)-Phases 'A' and 'B'* of the DOTC has been contracted to DIGITEL. As an exchange carrier, DIGITEL has the largest coverage in the region and has its own Internet Service Provider (ISP) to cater to the needs of all its clients, if needed. Specifically, all DIGITEL lines are *internet*- capable.

Meanwhile, the interim operation and maintenance of the RTDP-Phase 'C' is with the Telecommunications Office (TELOF) Region 2 while awaiting a private exchange carrier to take over. However, these telecommunications infrastructure are not fully utilized and have started to deteriorate due to the lack of financial support for the hiring of additional personnel to man the Phase 'C' facilities.

Relatively, the region's telecommunications network is presently experiencing underutilization of capacities due to duplication of existing facilities by infrastructure roll-out.

To date, three private cellular mobile telephone companies are operating in the region. However, the areas of coverage include only municipalities that are deemed profitable. The observed preference of and portability of cellular phones over landlines have created the need for more cell sites to also service the remote municipalities.

Table 67. State of Telecommunications, Region 2
As of 2002

Telecommunications Industry

Telecommunications Industry Structure	
Telecom Service	**Number of Operators**
Local Exchange Carrier (LEC)	3
Cellular Mobile Telephone Service (CMTS)	4
Domestic Record Carrier	3
Very Small Aperture Terminal (VSAT)	4
Radiotelephone	2
Value-Added Service	3

Local Exchange Carrier Service

TELEPHONE DISRIBUTION PER OPERATOR
As of June 30, 2002

Telephone Operator	Installed Tel. Lines	No. of Subscribers	% Subscribed Over Total
PLDT	9,527	6,701	70.34
DIGITEL	27,915	24,758	88.69
TTPI	1,440	725	50.35
TOTAL	*38,882*	*32,184*	*82.77*

TELEPHONE DISRIBUTION BY PROVINCE
As of June 30, 2002

Province	*Tel. Lines*	*Subs*	*Population*	*Teledensity*	
				Telelines	**Subscribed**
Batanes	0	0	15,286	0	0
Cagayan	14,975	11,621	994,109	1.51	1.17
Isabela	17,443	15,008	1,323,408	1.32	1.13
N. Vizcaya	6,284	5,384	381,750	1.65	1.41
Quirino	180	171	154,369	0.12	0.11
Total	*38,882*	*32,184*	*2,368,922*	*1.36*	*1.12*

TELEPHONE DISTRIBUTION PER OPERATOR

Telephone Operator	*Installed tel. Lines*		*No. of Subscribers*	
	mid 2001	*mid 2002*	*mid 2001*	*Mid 2002*
PLDT	9,299	9,527	7,553	6,701
DIGITEL	26,465	27,915	23,636	24,758
ETPI	1,440	1,440	680	725

Source: National Telecommunications Commission Region 02

H. DEVELOPMENT ISSUES AND CHALLENGES

With the considerable gains of Cagayan Valley Region in the last decade, the region is still considered as one of the lagging regions in the country in terms of economic development. Based on the assessment of its existing socio-economic and physical conditions, some of the major development potentials and constraints the region is currently facing are:

h.1 Underdeveloped resources

Amidst the issues and problems constraining economic growth in the region, it possesses considerable potentials that could develop the area at par with other progressive regions in the country if fully developed and utilized. Among the important potentials of the region are:

h.1.1 Wide expanse of rich agricultural areas.

The region has vast prime agricultural lands suitable to a wide range of agricultural crops and commodities. With barely 46.32% irrigated of the potential irrigable area of 472,640 has., Region II can easily earn the distinction of a prime food supplier to the rest of the country, especially in grains and legumes. The maximum utilization of this potential, the region could become a major supplier of other commodities as well, particularly those with high linkages to industries.

h.1.2 Productive forestlands and vast grasslands.

Although the region is faced with the problem of rapid denudation, there still remain a vast forest which are rich sources of hardwoods and other exotic species, lumber, rattan, bamboo and other products. The logged-over areas and vast natural grasslands also provide great potential for livestock production, an area which could be fully developed and improved in line with the national thrust on agro-industrialization.

h.1.3 Abundant inland water and marine resources.

The four inland provinces of the region lie within the country's largest river basin and are crisscrossed with numerous rivers and tributaries, lakes and other inland bodies of water. If properly developed and managed, these could amply provide the water needs for domestic, agricultural and industrial purposes not only the region but of other neighboring areas as in the case of the Casecnan Dam which channels its water to Region III particularly to the Pantabangan Reservoir. The region's water resources also provide a good resource for inland aquaculture, recreation and tourism activities. Furthermore, the same river could further expand the role of the region as major supplier of hydropower to the rest of the country. Meanwhile, the marine potentials of the region's territorial waters off the Pacific Ocean and the Balintang Channel on the east and north, respectively, remain relatively untapped.

h.1.4 Undeveloped mineral and indigenous energy resources.

The region's known reserves of both metallic and non-metallic minerals like gold, silver, copper, coal, limestone and oil are as yet not fully surveyed and remain underutilized. These resources could be used as inputs for the industrial development of the region with possible surplus exported to other areas of the country. Along with the mineral resources

of the region are its indigenous energy potentials that that have limited support to research and development (R&D).

h.2 Development Challenges

The development of the region continues to be cautioned by several challenges and problems mainly hinged on sustainability issues. The challenges that remained a threat to environmental integrity in the region are the following:

h.2.1 Incompatible land uses

Incompatible land uses in the region has been emerging as a serious concern over time. The increasing demands for land utilization primarily driven by competing economic activities pose threat in the sustainability of land use and remains to be a challenge in sustainable development. The illegal conversion of prime agriculture areas to other uses and other incompatible land uses has been attributed primarily to the incomplete delineation of land use zones/areas and the weak implementation of Comprehensive Land Use Plans (CLUPs) through zoning ordinances and other land use laws and policies. The incomplete delineation of A&D lands and Forest Areas, hazard prone areas and other protected areas contributes to the incompatible land uses in the region. As a result, Grassland and brushlands are being cultivated, mining application are overlapping with other land uses, and hazard prone areas that are not properly identified poses threat to the populace. The lack of ground delineation of these areas has led to the haphazard implementation of land use laws and ultimately the proliferation of unsustainable utilization of land in the region.

h.2.2 Encroachment on Protected Areas

The increasing population and the ineffective regulation on land use policy implementation has put pressure in the intrusion of protected areas in the region. Watershed areas and other bio-diversity-rich areas have been vulnerable to human intrusion and resource exploitation. The dwindling economic opportunities in the lowland areas paved the unabated intrusion and illegal economic activities of the population in forest and other protected areas. Economic activities in these areas included illegal logging or timber poaching, slash-and-burn or kaingin, illegal fishing and even illegal mining. Specifically, the primary target of illegal economic activities includes protected forest areas, watershed areas, coral reef areas and other critical areas with abundant resources.

Relative to the rampant illegal activities in protected areas and considering the wide expanse of the area to be monitored, the region lacks the necessary manpower, facilities and equipment to effectively address the problem of illegal logging, timber poaching and illegal settlements within the forest area.

h.2.3 Environmental Degradation

In the last decade, environmental degradation has emerged and became a foremost issue and a global concern. In Region 02 the extent and gravity of the damages made in the environment manifested in the form of natural calamities. Recorded disasters caused by environmental degradation include flashfloods, landslides and prolonged flooding. Disasters as these have been apparent in degraded lands both in the rural and urban areas. Due to deforestation and other unregulated upland activities, soil (upland)

erosion has become a serious issue as it affects downstream development activities. Riverbed and other downstream waterways have already silted that causes immediate and prolonged flooding along riverbanks and the decrease of productivity in prime agricultural areas due to siltation.

Contributory to environmental degradation are the sporadic and unregulated settlements in protected areas, population pressure in urban centers and encroachment in agricultural areas and other protected lands.

h.2.4 Low Productivity

While Region 02 played the role of "a grains producer and a food basket of the country", it has yet to improve its productivity particularly for rice and corn. Its 3.7 MT yield per hectare in rice production is still behind the 4.29 MT/has. target and way below the 6.0 MT yield of our ASEAN neighbors. On the other hand corn productivity at 3.04 MT/ha. is lower than the target productivity of 4.02 MT/has. Contributory factors to this situation are the low acceptance of improved farming technology, high preference for in-bred varieties, poor infrastructure support facilities and inappropriate land uses in relation to land suitability and capability.

In the fishery sector, production remains relatively low at 41% sufficiency level. Amidst the vast potential for aquaculture industry, it only managed to contribute 12.09% in 2002. Bulk of the fishery production comes from municipal and commercial sector contributing 49% and 38% respectively.

h.2.5 Unmanaged Exploitation of Resources

The region's rich natural resource endowment is presently threatened by unsustainable activities. The vast resources of the region are faced with competing development activities driven by economic gains. The long-term sustainability of resource exploitation has been lowly regarded specifically on illegal and unregulated resource utilization. If left unattended this will cause irreparable damage to the environment. Unchecked forest and watershed denudation will cause a domino of negative effects on the environment e.g., drought, severe soil erosion, flashfloods, siltation, low agricultural productivity, etc.. Unsustainable farming method is also causing the reduction of the region's grains productivity and the vast grazing potential the region also remains barely tapped. The region's 890-km stretch of rich coastal fishing grounds is likewise relatively undeveloped. The rich municipal fishing areas are the frequent target of poaching by foreign fishing vessels. These rampant and irrational utilization of resources from upland forest down to lowland valleys and water resources is acknowledged as the major cause of environmental degradation.

h.2.6. Inadequate Infrastructure support facilities and utilities

Although Infrastructure sector gained considerable improvement in the last decade, the effort was not sufficient to provide the necessary support facilities to the other sectors of economy. The inadequacy of support facilities and infra utilities is almost apparent in the different sub-sector i.e., regional access routes and farm-to-market road, irrigation facilities, water resource development, port and airport development, energization and communication services and facilities. The region lacks efficient alternate route into and out of the region and all-weather access roads to remote municipalities and production areas necessary to promote regional development. The isolation of rural areas resulted to

the slow and inequitable delivery of basic services and the stagnation of rural economy. Coupled with the lack of roads is the slow-paced electrification in rural areas and the low density and limited coverage of telecommunication services in the region. The region has thus far covered only 46.52% of the potential area for irrigation. This leaves about 252,000 hectares of irrigable areas needing to be developed. The region is also in need to address the independent approach in water resource management.

Chapter 3
THE REGIONAL PHYSICAL FRAMEWORK PLAN

1. REGIONAL DEVELOPMENT VISION

Destined to play a significant role in national development, the region has purposively set its long-term development vision to be "***A Region of world class, empowered and productive citizenry and competitive agri-industrial economy, modern infrastructure, responsive basic services and well-managed eco-system in peaceful and orderly communities at one with God, among themselves and with the rest of the world. It will be a physically developed area with a rational network of agri-related industries and spatially accessible services while providing for equal economic opportunities. This is supported by a strategically located infrastructure, a stable watershed and bio-diversity rich areas".***

This vision will be supported by the complementation and integration of all sectors at the different levels. The cohesive interplay of the different sectors to include economic sector, (production and protection land use), social sector (settlements component) and infrastructure development shall be ensured.

The following key spatial vision components will guide physical planning and land use activities at the regional and sub-regional levels within the Plan period:

Physically developed areas highlight the importance of physical planning through the integration of the features of population and its needs; land resource and its potentials and limitations; and infrastructure support, into a physical framework that guides socio-economic activities at the regional and sub-regional levels;

Rational network of agri-related industries places emphasis on agriculture as the main economy of the region and the need to strengthen the sector, the development of strategically located industries with backward and forward linkages to agriculture to operationalize a system that extends development across the region;

Spatially accessible services and economic opportunities ensure the empowerment of everybody by providing equitable access to social services, resources and opportunities;

Strategically located infrastructure gives emphasis to the need for cost-efficient infrastructure that provides the most significant impact to regional and local development; and

Stable watershed and biodiversity rich areas recognizes that the region is endowed with diverse natural resources and that the preservation of environmental integrity supports regional development aspirations for both the present and the long-term horizon.

2. THE PARALLEL GROWTH SPATIAL STRATEGY

2.1 The "Parallel Growth" Concept

The "Parallel Spatial Development Strategy" serves as the overall framework for the utilization and allocation of the region's physical resources and development requirements consistent with the overall development vision and objectives. In concept, "parallel development' stands for a harmonized relationship between the region's desire to facilitate and attain agri-industrial development and the need to enhance the region's environmental integrity. In terms of the regional distribution and direction of growth, "Parallel Development" also implies that the specific sub-regional areas will be accorded the necessary interventions to enhance their respective development potentials as well as complement the development of the other areas (***Figure 45***).

While revolutionizing agri-industrial development in the region, equal attention will be accorded in the protection and sustainability of land utilization. Ground delineation will be pursued to properly establish permanent forest line boundaries and identify protection and production areas, hazard prone areas and other environmentally critical areas such as watershed and bio-diversity-rich areas. This is in support to comprehensive planning, zoning preparation and environmental protection advocacy.

Settlement will be closely monitored and regulated to safeguard protection of critical areas and influence the pattern of development to further strengthen urban-rural complementation. Metropolitan arrangement of cities and municipalities will be encouraged to promote sharing of resources and services and boost the distinct potentials of LGUs. Outward-looking policies particularly on the complementation of Region 02 to the Northern Luzon Growth Area (NLGA) and the rest of the world will be supported. Infrastructure will focus on the provision of support facilities and utilities of the economic and social sector.

Considering the ecological and socio-economic significance of the Cagayan River, the spatial strategy therefore highlights this critical land resource. The entire Cagayan Valley is considered a major watershed and is traversed by this major river system, which is the longest river (520 km) in the country.

2.2 The Role of Region 02, its Provinces, Cities and Fast Urbanizing Areas

Being a predominantly agricultural Region, Cagayan Valley will be the primary supplier of agricultural products and a major producer of power. Owing to its vast agricultural potential, the region will be promoted as an investment area for agriculture, forestry and fishing industries and with its strategic position along the north east coast of Luzon, Port Irene in Sta. Ana, Cagayan will be developed as a transshipment point in Northeastern Luzon.

Given the vision and long-term goal of the region, the five (5) provinces, three (3) cities and emerging growth centers in the region shall likewise play critical roles in the attainment of the desired state of the region. The assigned roles of the provinces, cities and fast urbanizing areas are based on their present strengths and potentials. Following are the distinct roles of the provinces, cities and emerging centers in the region:

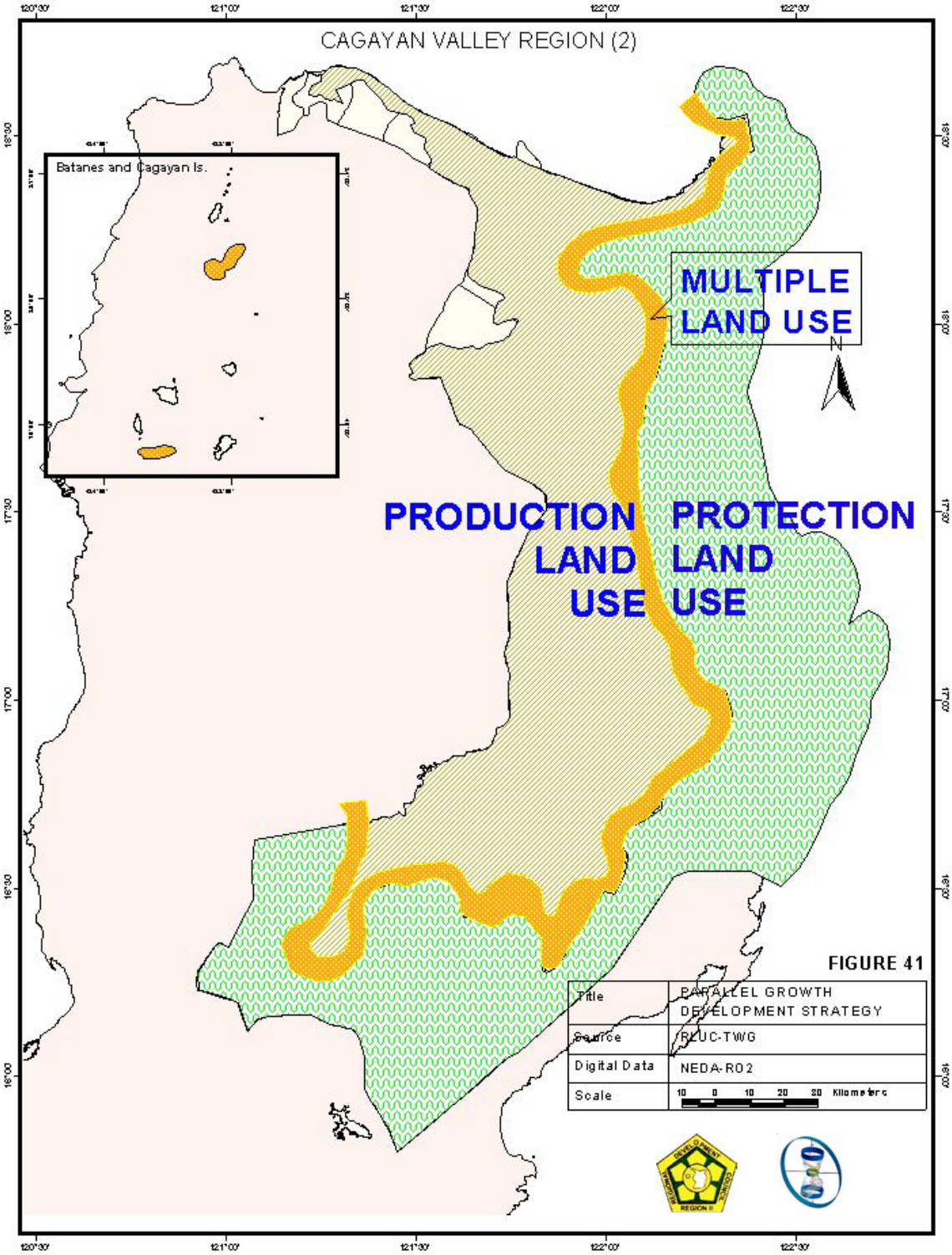


FIGURE 41: PARALLEL GROWTH DEVELOPMENT STRATEGY

Batanes – with its high potential for large scale commercial production of fish and fishery products on top of its pristine beauty and unique cultural heritage shall be the region's ***Marine Fisheries and Eco-Tourism Core"***

Cagayan – aside from its proximity to Southeast Asia bolstered by the presence of an economic zone, Cagayan has the longest coastline in the region. It is the only province in Region 02 which has two nationally acclaimied tourist destinations; the Our Lady of Piat Shrine and the municipality of Sta. Ana, the site of the annual International Anglers' Competition. It being the seat of industry, trade and commerce; government and institutions, it shall serve as the region's "***Institutional, Industrial and International Trade Center"***

Isabela – Considering its demonstrated strength in trade and commerce; its strategic location at the center of the region; and the proposed establishment of the Regional Agro-Industrial Center (RAIC) at Cauayan City, the province shall serve as the region's "***Regional Trade and Industrial Center".***

Nueva Vizcaya – In view of its location within the watershed of the Caraballo and Cordillera mountain ranges and its distinction as the major source of fruits and vegetables in the region, the province will serve as a ***"Watershed Haven and Agro-Forestry Hub".***

Quirino – Located within the Sierra Madre mountain range with croplands suitable for industrial crops, and at the same time endowed with rich natural scenic spots, the province will serve as the region's ***"Industrial Crops Producer and Agri-Tourism Destination".***

Cities in the region are relatively young compared to other cities in the country. Each of these urban centers, however, have their distinct comparative advantages where their respective roles are foreseen to take form and be recognized namely:

Santiago City – "Regional Center for Trade and Commerce"

Tuguegarao City – "Regional Educational, Institutional and Government Center"

Cauayan City – "Regional Agri Products Marketing and Processing Center"

Fast urbanizing centers shall further be developed and strengthened to assume the key roles defined in the delineation and clustering of the development zones to support the primary urban centers of the region.

2.3 Basic Elements of the Spatial Strategy

The concept of 'parallel growth" is translated into its physical dimension with the following elements:

a broad delineation of the region into three (3) major land use categories:

- Protection within the forest corridor
- Production at the valley side
- Multiple use within the Cagayan Riverine Zone, as well as other land areas with more than one distinct use

further disaggregation of the region into development zones

Broad Land Use

The region will have three major land uses, namely: protection land use within the Sierra Madre Conservation Corridor, production land use at the valley side where rich agricultural plains and forest production areas are located, and multiple use within the Cagayan River and selected land areas.

The Sierra Madre Corridor is a solid block of highly protected areas stretching from Cagyan, through Isabela, Nueva Vizcaya and Quirino and up to the provinces of Aurora and Quezon of Region 03. Interconnecting protected areas and serving as the source of critical resources that include water, minerals, wood and other energy resources and where biodiversity is believed to be one of the richest in the world, main development efforts will be focused on environmental rehabilitation and protection measures.

Multiple uses in certain zones can be harmonized to maximize the numerous benefits from land and water resources. The identification of these zones takes into account the existing resource endowments within these areas, with the basic consideration that the proposed activities are not in conflict with the general delineation of the area for protection or production purposes. Also, the assignment of multiple land uses is consistent with existing laws and issuances such as the NIPAS Act, IPRA, Mining Act, among others.

The Cagayan River will continue to assume a special significance ecologically, economically, socially and culturally in the region. Aside from the protection of the river and its riverbanks, there is likewise a need for the conservation of the endangered *ludong* fish and other rare biological species in the Cagayan River. On the other hand, said river and its tributary, the Magat River, will continue to be major fishing grounds for tilapia, other edible fishes and shellfishes. The navigation routes and recreation activities along the river will be increased. The tributaries will continue to be harnessed for irrigation and hydroelectric potentials. There is also the need to implement watershed management essential to mitigating the problems brought about by sedimentation and inundation. With proper watershed management interventions, the River's development potentials along fishery, tourism, irrigation, energy and navigation will be completely realized.

Other multiple use zones in the region are the following:

The whole province of Batanes which has been proclaimed as a Protected Seascape and Landscape, with huge potentials for its fishery and eco-tourism

The forest areas with zones that are delineated for other purposes such as settlements, timber production, eco-tourism and source of water and energy requirements

Coastal areas where fishery development and eco-tourism are allowed.

Development Zones

Being endowed with a diverse natural resource and a wide range of economic potentials, the region is further sub-divided into development zones. These zones are delineated based on homogeneity in terms of natural resource endowments. To rationalize development interventions in these areas, these development zones will be considered as an integrated area for purposes of development planning and program/project implementation.

The identified development zones and their corresponding influence areas are as follows:

Broad Land Use	Development Zones	Cluster/Influence Area
1. PROTECTION	Conservation Zones	Sierra Madre Biodiversity Corridor Northeastern Sierra Madre de Cagayan Conservation Area Peñablanca Protected Landscape and Seascape Northern Sierra Madre Natural Park Southern Isabela Conservation Area Quirino Protected Landscape N. Vizcaya Conservation Area Island Protected Areas Batanes Land and Seascape Cagayan-Apayao Diptherocarp Forest
2. PRODUCTION	**Development Areas**	
	Free Trade Zone	Sta. Ana – Gonzaga – Aparri (Fuga Island)
	Economic Zones	Cauayan City - Reina Mercedes Batan Island
	Light Industrial Estate	Bagabag – Diadi/ Quezon Bambang-Aritao-Sta. Fe
	Regional Institutional/ Financial/Commercial Zone	Metro Tuguegarao ASTEP (Amulung-Solana-Tuguegarao City – Enrile-Peñablanca)
	Regional Commercial/ Financial Zone	Santiago City – Echague – Cordon- Ramon – San Isidro
	Provincial Institutional/ Commercial Zones	Lallo Ilagan – Gamu – Tumauini Roxas – Mallig San Mateo Cabarruguis-Diffun-Maddela Bayombong-Solano-Bambang Basco
	Agriculture Zones	Cagayan lowland municipalities Selected Isabela lowland municipalities Selected Qurino and Nueva Vizcaya municipalities

Broad Land Use	Development Zones	Cluster/Influence Area
	Fishery Zones	Selected Cagayan Island & Coastal Municipalities Isabela Coastal Municipalities Magat Dam Batanes Island
	Agro-Forestry Zones	Province of Quriino N. Vizcaya Upland Municipalities Isabela Upland Municipalities Cagayan Upland Municipalities
	Potential Mining Zone	All provinces with mineral potentials in the region.
	Tourism Zones	
	Island Tourism Zones	Batanes Island Group Calayan, Cagayan (Babuyan) Island Group
	Coastal Tourism Zones	Northern Cagayan Coastal Area Coastal Isabela Area
	Upland Tourism Zones	East Cagayan Area West Nueva Vizcaya East Nueva Vizcaya Quirino Area
	Lowland Tourism Zones	West and Central Cagayan Area West and Central Central Isabela Area Central N. Vizcaya Area
3. MULTIPLE USE	Cagayan Riverine Zone	Cagayan River and its tributaries Batanes Province Coastal municipalities
	Other multiple use zones	Mixed use areas in forests

3. SPATIAL GOALS, OBJECTIVES AND POLICIES

3.1 Production Land Use

The spatial strategy of attaining "parallel growth" entails the optimum development of the region's production areas alongside environmental regeneration and preservation within delineated protection areas.

Production land use refers to the direct and indirect utilization of land resources to meet socio-economic development requirements. The region's production areas include agricultural areas, coastal and marine zones, production forests and tourism development areas. Under the "parallel growth concept", the prime concern of production land use is to provide adequate and spatially accessible space for sustainable food production, timber production, industry and tourism. It also aims for an efficient, equitable and sustainable manner of utilizing and managing these resources to pave the way for the realization of the region's thrust of agri-industrial development within the long-term.

To ensure sustainable development, the Production Land Use Component of the RPFP shall regulate development activities particularly in the utilization of the region's existing resources. Primarily this includes policies to control exploitation activities and to push for the judicious and rational development of land and water resources in the region to ensure a sound environment.

The strength of agricultural development will pave the way for the realization of the region's thrust of agri-industrial development. The industrial areas that will place Region 02 in a strategic position along commerce and trade are the Cagayan Special Export Zone and Free Port at Sta. Ana, Cagayan, the Cauayan Regional Agri-Industrial Center in Isabela, the Bambang-Aritao-Sta. Fe-Quezon Industrial Estate in Nueva Vizcaya and the Batanes Ecozone. Support industries, especially those which serve as the forward link to agriculture sector are encouraged to locate in these industrial areas. The complementation of these industrial zones further asserts the dynamic role of the region within the thirty-year period as the next trade and industrial hub in South East Asia. Community-based ecotourism will also be encouraged. This will promote economic activities at the grassroots level, providing alternative livelihood to people's organizations.

3.1.1 GOAL:

Optimize the sustainable use and management of resources towards a greater Agri-Industrial productivity.

3.1.2 OBJECTIVES

To sustainably manage the development and utilization of the region's resources;
To tap and judiciously utilize the undevelop land and water resources of the region; and
To strengthen capacity of R & D and extension services management for countryside to prioritize eco-tourism sites for development.

3.1.3 POLICES AND STRATEGIES

a. Economic integration with the rest of Northern Luzon through the North Luzon Growth Area (NLGA) initiative

The North Luzon Growth Area (NLGA) comprises the contiguous regions of Ilocos (Region I), Cordillera (CAR) and Cagayan Valley (Region 2). The inter-regional economic integration allows for the complementation of resources, expansion of markets for local products, and harmonization of the development efforts of the three member regions. The North Luzon Area, with its strategic location and abundant natural resource, also offers a strong potential of establishing trade with the progressive countries of East Asia.

The region shall aim to optimize the benefits to be derived from undertaking collaborative development efforts with the rest of the Northern Luzon Area. It will be guided by the concept of mutual benefit in harnessing the region's comparative advantages and concretizing the economic integration of Regions 01, 02 and CAR under the NLGA program.

b. Protection of prime agricultural lands from conversion into non-agricultural uses

Region 02 will continue to play a major and crucial role in the attainment of the national policy on food security, being the country's top grains producer. In the preparation of provincial and city/municipal land use plans (PPFPs/CLUPs), local governments, in coordination with concerned national agencies, shall identify and delineate irrigated and potentially irrigable agricultural lands. These areas, which will be zoned as prime agricultural areas, shall be protected and will be non-negotiable for land conversion. Appropriate measures shall also be devised and implemented to ensure that such lands are not indiscriminately converted.

Among the specific strategies to protect the region's prime agricultural lands are as follows:

Provision of buffer strips specifically in critical areas (prime agricultural areas, watershed areas, forest areas, etc.) to clearly identify and delineate protected agricultural areas and ensure land use compatibility and sustainability;

Prioritization of lands with poor crop suitability for settlements or industrial expansion areas;

Discouraging settlements along access roads passing through prime agricultural lands and restraining further growth of existing settlements along such access roads;

Strict compliance with the policy of non-negotiable conversion over all irrigated lands and all agricultural land with irrigable lands covered by irrigation projects with firm funding commitment. Prime rice (whether irrigated and non-irrigated) and corn areas shall be subject to strict protection and preservation;

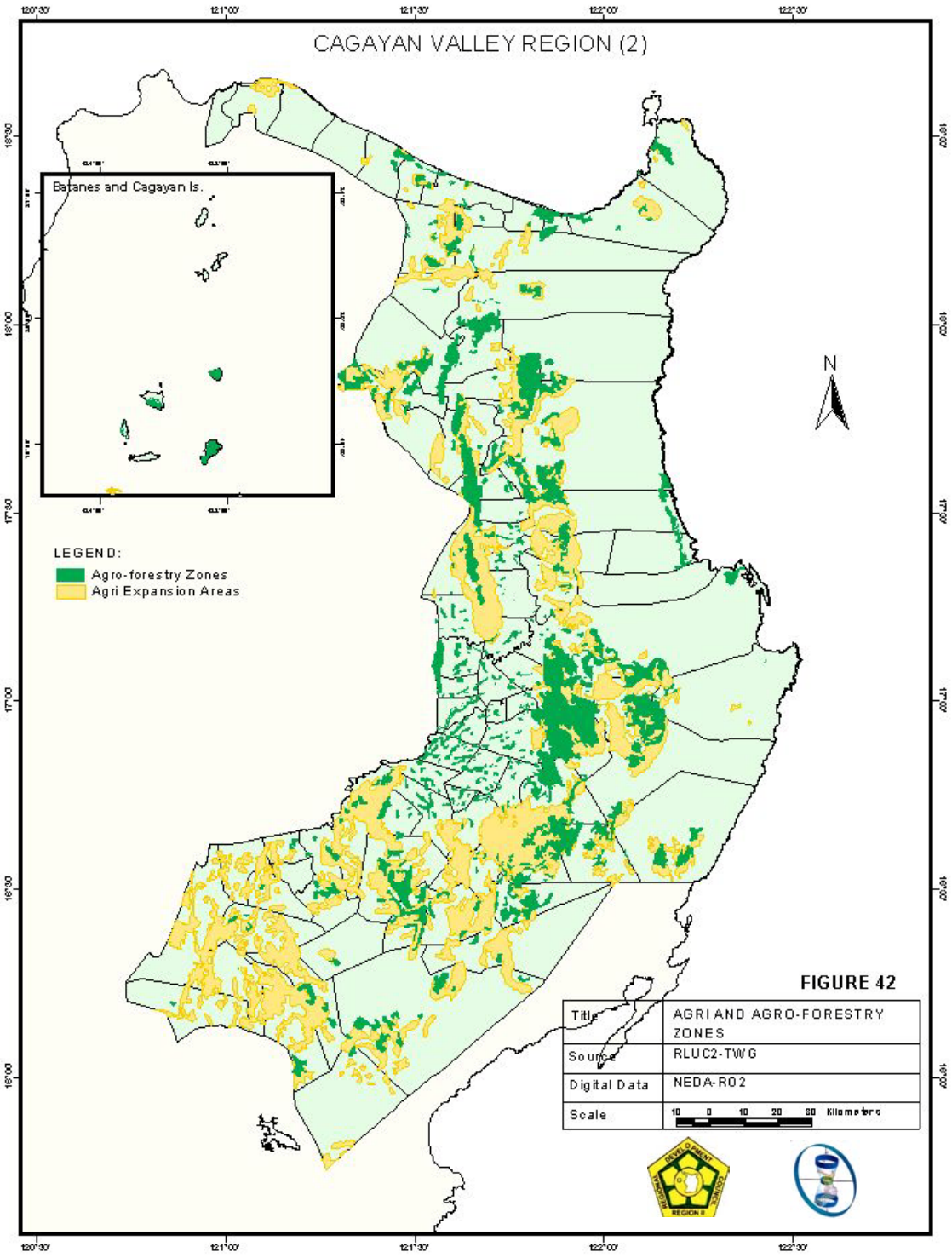


FIGURE 42 - AGRI AND AGRO FORESTRY ZONE MAP

Determination and allowing areas for conversion, where:

The proposed use shows greater derivable economic benefits than its present use and ensuring that the conversion has no adverse impact to the adjacent areas which may be affected by such activity;

- No other reasonable option is available for accommodating a land use, activity or facility that has been identified as a higher priority, and where economic benefits will prove to be more beneficial; and
- Such conversion will accommodate a land use, activity or facility necessary to improve food production.

Passage of corresponding local ordinances by LGUs governing non-conversion of prime agricultural lands. To ensure compliance, the real tax mapping capability of LGUs should be strengthened and institutionalized for the imposition of penalties on idle prime agricultural lands. Prime agricultural lands that are left idle for more than the time to fallow should be taxed a higher rate to serve as encumbrance for its non-use.

c. Implementation of SAFDZs through Land Use and Infrastructure Planning and Zoning

The region has a total of 946,642 hectares SAFDZ's. These serve as the key agricultural production area owing to its role in achieving national sufficiency in grains. These areas are the primary foci of the intensive efforts and investments for development and modernization. To ensure its implementation and protection, it shall be guided by the following strategies:

Identification by LGUs of location and boundaries of SAFDZs within their respective jurisdiction to address overlapping boundaries and inconsistencies in land use and area. Once identified, these are designated as key production areas. LGUs shall update their SAFDZ to further identify areas that can be potentially classified for SAFDZ inclusion and for an accurate delineation of these areas. A unified and coordinated geographic or land information system for easy access, exchange and sharing of data and information among national and local planners should also be developed;

Identification and delineation of marginal agricultural lands within the SAFDZs that may be reclassified to other non-agricultural land uses, as provided under the AFMA and incorporate the same in the CLUPs;

Provision of tax incentives to SAFDZ areas which are regularly utilized for their identified purposes and the development of community-LGU network of collaboration to strengthen the monitoring of illegal and premature conversion of SAFDZ areas;

Intensive promotion of agricultural programs that will support and encourage the development of SAFDZ areas. Parallel to this is the identification and strengthening of LGU-PO-NGO and NGA collaboration for the development of SAFDZ areas. It is also significant to provide appropriate technology support and improve extension programs in order to optimize the production potentials and develop the initiative and independence of landowners in cultivating their own farm lots; and,

Coordination with other LGUs for identification, implementation, co-management and rehabilitation of common facilities, utilities and infrastructure that are supportive to SAFDZ development through:

- Alignment of roads and other infrastructure projects to reduce conversion and environmental pressure on SAFDZs;
- Designation on the use of adjacent areas for agro-industries or other activities complementing agriculture;
- Provision of sufficient buffer zones between intense land uses and SAFDZ boundaries; and
- Creation of fiscal and other incentives to promote SAFDZ market viability.

d. Identification of Potential Agricultural Expansion Areas

The conversion of some agricultural lands to non-agricultural uses is unavoidable. In this case, expansion of agricultural activities to marginally utilized and idle yet suitable agricultural areas should be pursued through the following:

Identification and delineation of agricultural lands outside of the SAFDZs, which can be classified and subsequently subjected for protection. Possible expansion areas include suitable lands under the unclassified areas of production forestlands, which are undergoing study for possible release in the second phase of the plan (***Figure 43***);
Tapping and developing areas with marginal and soils problem for crop production expansion through soil amelioration technologies;
Assessment of potential expansion areas for agricultural production with respect to other land use requirements through the use of the following parameters: soil suitability, market and production input access, potential for infrastructure and other support facilities, potential for integration with SAFDZs, impact on existing livelihood and other activities of current residents and occupants, and other environmental impacts; and,
Assessment of alternative uses of depleted lands such as marginal croplands to livestock areas, grazing lands to urban or industrial use and others

e. Provision of Support to High Value and Industrial Crops Development

A look at the existing croplands shows that the largest portion is devoted to grains production, with only very small area planted to industrial crops and other food crops of high value. This partly explains the slow investment inflow and lack of employment-generating industries in the region. The low production levels of industrial crops do not warrant the establishment of local processing industries. Agricultural resources, the major endowment of the region, should be optimized through a shift in cropland utilization toward greater production of industrial crops that attract resource-based investments to the region. To ensure industrial crops production and sustainability of production volume within the plan period, the following strategies shall serve as the guide at the local level:

Identification and utilization of marginal rice and corn production areas and idle lands which are more suitable for high value and industrial crops production. This is shown by the large area of unirrigated paddy rice and upland rice with low productivity.
Convincing farmers of marginal and idle lands to shift to high value and industrial crops production which generate higher returns;

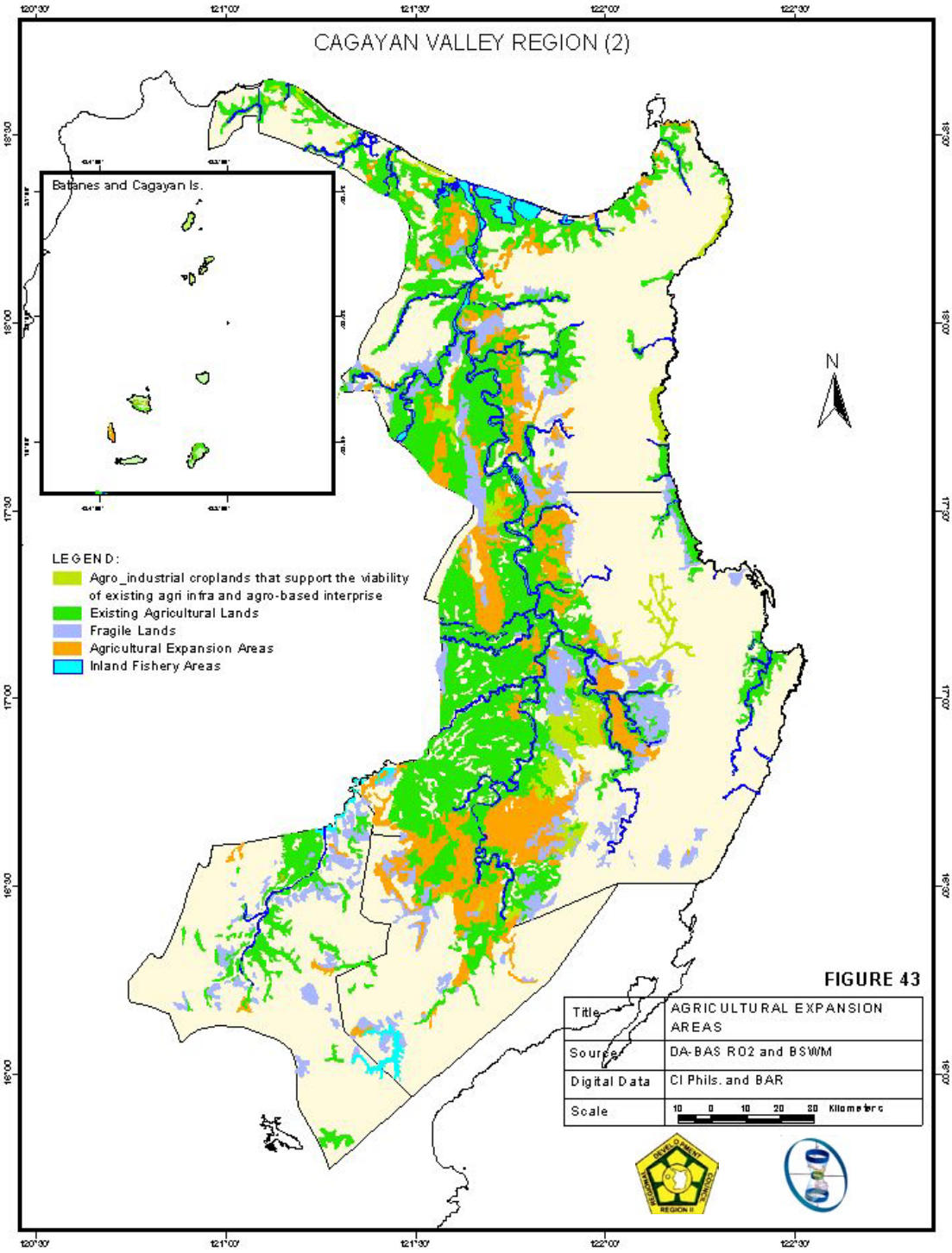


FIGURE 43: AGRICULTURAL EXPANSION AREAS MAP

Encouraging the shift from mono cropping to multi-crops or integrated farming as an initial step to high value crops development;
Provision or development of marketing system or processing industries to serve as a direct forward link for high value crops; and
Pushing for the higher allocation or concentration of areas for major high value crops. Such increase in area would be needed to support the agro-industrial promotion activities of the region.

f. Promotion of Agri-Industrialization Development

The region envisions a vibrant economy, which hinges on industries that are closely linked to the agricultural development of the region within the next thirty years (***Figure 44***). The region will focus on strategies that will chart the economic growth of the region, namely:

Dispersion of economic activities to the countryside through the accelerated development of SMEs;
Provision of a strong domestic supply base for domestic and globally competitive industries;
Reduction and simplification of credit requirements and guaranteeing mechanisms to facilitate the access of small, micro and cottage industries to financing windows;
Promotion of cluster-specialized resources;
Rationalization of capability programs, which provides ready industry packages for small businessmen who are willing and determined to venture into business;
Provision of adequate, varied, reasonably-priced and high-quality goods and services;
Simplifying and streamlining of business procedures and the issuance of licenses and permits;
Development by LGUs of investor-friendly approaches through standardized and reduced business requirements and application procedures, charging reasonable fees, and setting deadline for the release of requirements;
Development and diversifying products and markets;
Promotion of market-oriented dispersal of industries to allow a larger number of population to benefit from employment;
Development of value-added chain based on the existing resources of the region;
Fast-tracking resolution of conversion issues that may affect the identified regional industrial centers;
Attracting investors through intensive promotion anchored on a demand-driven strategy ensuring availability of local supply to meet requirements for agri-processing undertaking; and
Promotion of sustainable development practices through clean production technologies and environment-friendly materials

g. Provision of Support Facilities and Utilities to Production Areas

To magnify the role of the region as a major grains producer, reliable and adequate infrastructure is crucial, hence, the need for the:

Identification of location/alignment of investments for basic infrastructure and services in production and rural areas, especially irrigation and drainage, farm-to-market roads and post harvest facilities;

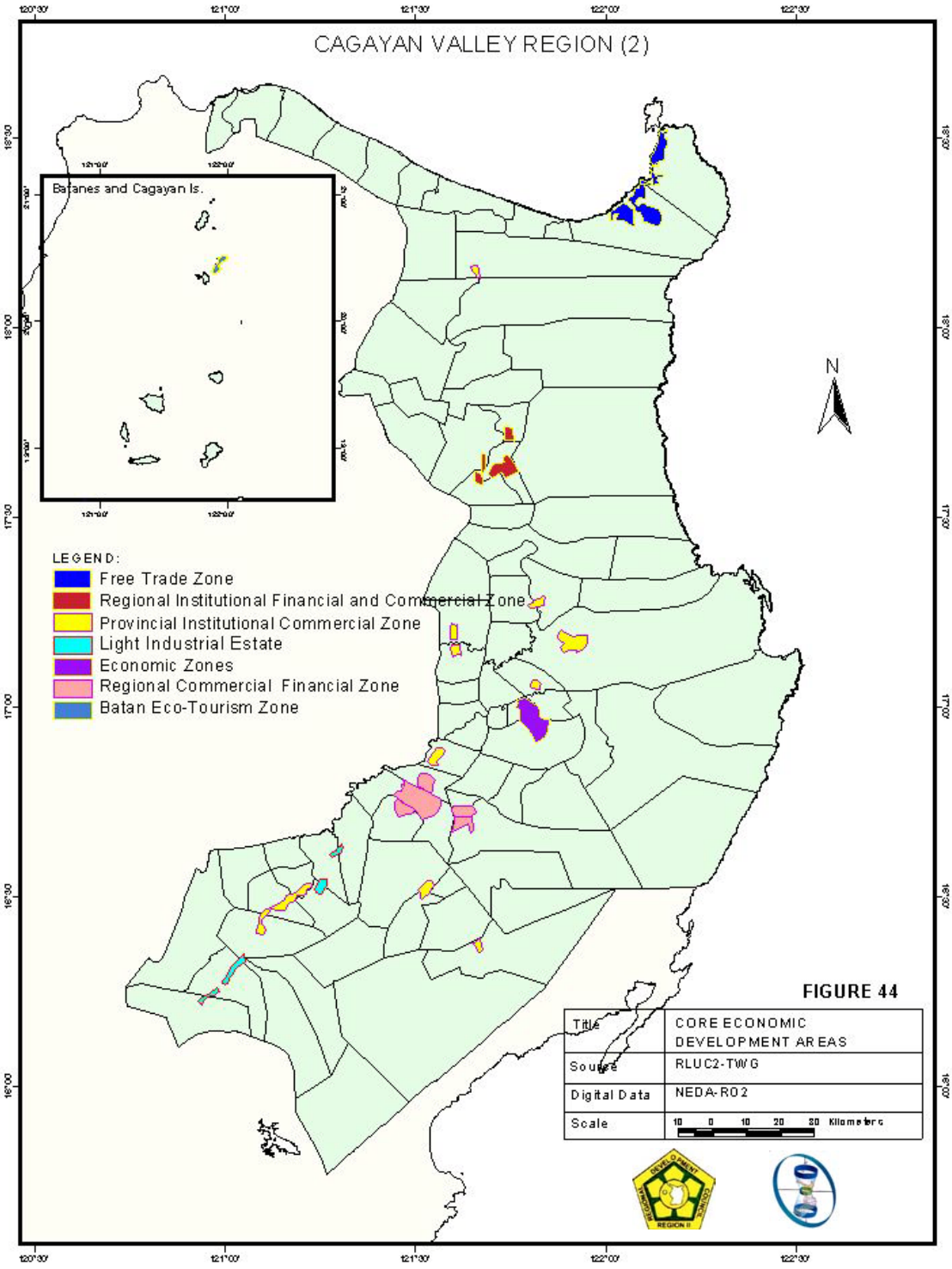


FIGURE 44: CORE ECONOMIC DEVELOPMENT AREAS MAP

Assessment of the level of support needed, categorize projects according to urgency, identify best cost-sharing arrangements and determine the role of the stakeholders during and after implementation;
Implementation of a countryside infrastructure program that shall connect new agri resource bases to processing facilities and markets;
Provision of adequate power supply and its strategic distribution among priority growth areas, i.e. SAFDZs;
Development of an efficient agricultural transport system through construction or rehabilitation of farm-to-market roads and bridges, expansion and improvement of port, handling and storage capacities; and
Strengthening of the Regional Geographic Information Network of land-based agencies. Members should follow a unified and coordinated geographic system for easy access, exchange and sharing of data and information among national and local planners.

h. Optimization of the Sustainable Use and Productivity of Agricultural lands

The need to increase productivity level applies not only to rice and corn but also to high value commercial crops, livestock and fisheries. Higher productivity is required to address existing supply gaps, to meet increasing demand due to population boom, respond to low per capita consumption levels, and increasing competition.

Increasing productivity is the main thrust towards long-term food security, which allows export of locally produced commodities, generate employment and income, and improve affordability of necessary import goods. For productivity enhancement, the following strategies will be adopted:

Identification and assessment of whether current production activities and productivity should be maintained, modified, expanded or reduced (and subsequently made available for other land uses);
Assessment of soil and crop suitability and recommending the timing and cropping mix;
Determination of land suitability, access and other physical considerations, local development objectives, demand requirements, and other market factors;
Resolution of conflicting SAFDZ areas to update soil and crop suitability areas;
Identification of cost-efficient and location-specific technologies;
Identification of sustainable approaches and promotion of the use of organic-based agricultural production;
Determination of high yielding but suitable varieties of crops or species;
Strengthening and conducting regular IEC to update farmers with the most recent technologies;
Continuous development of technologies that will improve and facilitate local productivity;
Promotion of the clustering of contiguous and identical crop production areas;
Promotion of the utilization of mechanized farming and full modernization in agriculture;
Building social infrastructures through community organizations and promotion of cooperatives development to facilitate access to production inputs, optimize marketing products, and mobilize rural credit and linkages;
Conduct of regular inventory of resources that contribute to domestic food production;

Provision of infrastructure, facilities and other support elements and mechanisms to other areas identified to be retained or developed for production activities;
Enhancing access of producers to post-harvest and processing facilities such as multi-purpose drying pavements, mechanical dryers, and farm-level grains centers;
Provision of extension programs as well as institutional support to the production, post-production facilities, and other support requirements for specific commodities;
Improvement of transportation linkages among food production areas, storage/distribution centers, and local markets in order to help reduce the cost of food production and distribution caused by access problems;
Provision of enough agriculture production support such as irrigation systems and strategically located post harvest facilities to help increase farm production and productivity levels;
Enforcement of existing laws and regulations consistent with the aforementioned; and
Enacting new regulations and ordinances to remedy weaknesses in current monitoring and enforcement practices down to the local level.

i. Disaster Management to Maintain Agricultural Productivity

The region will incorporate disaster management in locating and timing agricultural activities in order to cope with natural calamities and hazards and mitigate the accompanying impacts. The following shall be observed:

Establishment of information and database on the nature, location and pattern of occurrence and impacts of hazards; and
Identification and provision of mitigation measures and proper interventions prior, during and after the occurrence of the calamity, like:

- For El Niño episodes, areas suffering from low and inadequate rainfall must be monitored and location-specific measures to mitigate likely impacts must be identified. This also applies to areas that will likely be affected by the La Niña occurrence, particularly the flood-prone areas;
- For typhoon occurrences, forecasting system need to be improved and planting and harvesting seasons adjusted; and
- For geological hazards, areas vulnerable to geological hazards as results of earthquake, volcanism, fluvial, flood, coastal and mass movements must be identified and assessed. Appropriate information dissemination and mitigating measures should be done in these areas. Correspondingly, a Provincial Quick Response Team (QRT) composed of intersectoral/composite members from the line agencies, LGUs and NGOs should be organized to respond in cases of hazard occurrence;
- For all these natural occurrences, all LGUs, from the provincial down to the city and municipal level must utilize their mandatory calamity fund to respond to the immediate needs of affected families.

j. Promotion of Sustainable Practice in Agricultural and Fishery Production

Agricultural and fishery production shall be anchored on productivity, efficiency and sustainability (**Figure 45)**. Thus, farming practices will be improved through:

Adoption of environment-friendly farming and fishing practices to sustain the productivity of prime agricultural and fishery areas
Implementation of integrated pest management program and stopping the use of agricultural chemicals (particularly those banned in other countries) that are detrimental to the environment and public health;
Adoption of appropriate farming systems and technologies in sloping areas to reduce soil erosion;
Promotion of integrated farm or organic bio-diversity farm development;
Promotion of the use of organic fertilizers, biological pest control, and other environmentally sound farming tools and soil management techniques to increase land productivity; and
Promotion of recycling or reuse of effluents from agriculture and agro-industry.

k. Promotion of Large-Scale Livestock Production

In order to reinforce the livestock sector and address the insufficiency in meat (pork, beef, carabeef and chicken), strategies should focus on the development of large-scale livestock production, namely:

Regulation of predatory livestock development and shifting towards common or community livestock development, particularly for cattle, carabao, swine poultry, duck and goat. The purpose is to manage the effect of economies of scale as experienced in backyard raising;
Identification of areas that can be developed for community livestock development or for commercial scale livestock production;
Identification and development of community pastures for large and small ruminants;
Involvement of communities in the management and sustainability of common pastures;
Promotion of livestock associations through cooperatives development or variations to facilitate access to production inputs, appropriate technologies to improve breeder stocks, optimization of marketing products, and mobilization of rural credit and linkages;
Making the voices of raisers' heard and providing avenues for the distribution of goods and services for marketing and processing;
Strengthening quarantine and regulatory measures in order to maintain the animal health and meat standard and to arrest possible outbreak of livestock diseases;
Analyzing conditions and determining the best technology that are applicable to specific locations and breed of animals
Involvement of women in community livestock farming to strengthen their role in the farming household and raise their technological skills and entrepreneurial needs.

l. Strengthening Collaboration and Complementation of Concerned Agencies, LGUs and the Communities in the Conservation and Management of Coastal resources

The coastal resources of the region are highly vulnerable to exploitation. The passage of pertinent laws is not enough to address surmountable concerns. The following strategies

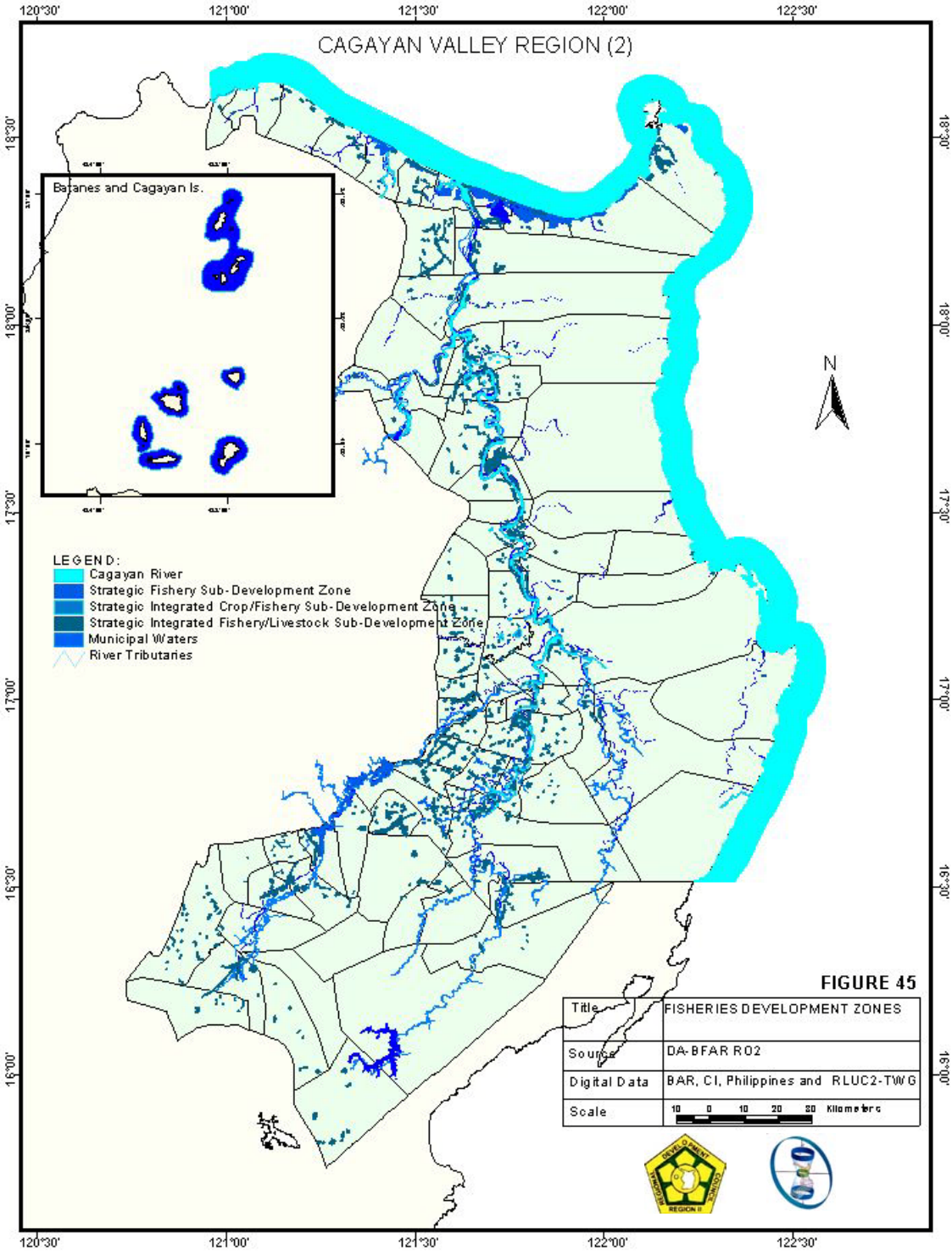


FIGURE 45: FISHERIES DEVELOPMENT ZONES

intend to provide the necessary direction for the region in the management of coastal resources:

Enforcement of RA 8550, otherwise known as the Philippine Fisheries Code, to curb poaching and encroachment into coastal resources of the region;
Sharing of resources, technology and expertise for the sustainable development, management and conservation of the fisheries and aquatic resources with the end purpose of achieving food security;
Protection of the rights of and provision of support to the fisherfolks for the preferential use of the municipal waters;
Promotion of the utilization of fishery resources by the private sector through partnership with the government for the sustainable development, management and conservation of said resources;
Development of stronger linkages between and among LGUs and other concerned agencies for the implementation of fishery and other related laws.
Complementation between the LGUs, BFAR and DENR on aquatic resources and coastal resources management;
Delineation of the roles and responsibilities between and among the LGUs, BFAR, DENR and other concerned agencies in coastal ecosystem management; and
Promotion of the development of areas with high potential for aquaculture industry and provision of support facilities and utilities.

m. Development of Areas with High Potential for Aquaculture Industry and Provision of Support Facilities and Utilities

Aquaculture and aquacapture development particularly commercial offshore fisheries operation are basic strategies to uplift socio-economic conditions of fish farmers and other investors in the fisheries industry. It promotes technology advancement and proper resource utilization & management for the purpose of increasing fish production in the region.

The full development of the region's fishery sector rests on the successful implementation of the Fisheries Code and AFMA, which provides for specific measures and strategies for the enhancement of production and productivity in the fishery sector. The region has 9,430 hectares of overused areas presently utilized for crops production and 1,354 hectares of underused areas that are more suitable for fishery production. This will be the focus of fishery development for inland fisheries. In reiteration, the following are the strategies that seek to fully harness the fishery potentials of the region:

Identification and delineation of Strategic Fishery Sub-Development Zones for aquaculture development;
Enforcement of the mandated delineation of all municipalities with identified and delineated Fishery Development Zones;
Provision of support and incentives to individuals who initiate the development of Strategic Fishery Sub-Development Zones;
Development of identified and delineated Strategic Crop and Fishery Sub-Development to integrated farming and fishery system areas;
Development of mariculture industry and sea ranching owing to the wide coastal area for fishery development;
Provision of fishery support infrastructures and facilities and upgrading of existing post-harvest facilities. These include fish landing ports, cold storage facilities, ice plants, and fish or marine products processing facilities;

Strengthening of the partnership of the concerned agencies (PFDA and BFAR) and concerned LGUs for the development and improvement of support infrastructures, which are classified as critical government input to development like fish ports and fish landing ports;
Active participation of the private sector in developing the fishery industry, especially in the development of support facilities. Build and Operate Transfer (BOT) arrangements are also encouraged especially for fish processing facilities, to serve as the forward link of the fishery sector;
Involvement of private sector in aquaculture and aquacapture for the optimal but sustainable utilization of inland, coastal and off-shore marine resources of the region; and
Promotion of the adoption of location-specific and cost-efficient technologies and provision of incentives to local investors engaged in large-scale fishery industry**.**

n. Development of "Timber Corridors and Non-Timber Production Areas"

Timber is one of the most important forest resources of the region. For years, timber industry has been significantly contributing to the regional economy particularly the wood-based industries, which are mostly of exportable quality. However, the unsustainable approach in harvesting timber resulted to the depletion of the resource. The remaining areas where timber species thrive are within the forest protected areas. Secondary growth forests are still in the process of regenerating. The present focus is through industrial tree plantations to serve as the source of timber requirements of the region. For the next thirty years, the following will serve as the guide of the region in harnessing this resource.

Disallowing timber harvesting in forest protected and proximate areas;
Encouragement and development of other livelihood activities for wood-based industries;
Consideration of Industrial tree plantations within production forest to support the wood-based industries and provide for the future timber needs of the region;
Identification, delineation and development of timber and non-timber production zones in every province for future resource requirements. These areas shall be prioritized within the secondary growth forest to include existing CBFM, SIFMA, and IFMA areas; and
Encouragement of private sector investment in industrial tree plantations and private tree farms.

o. Adoption and Promotion of Responsible Mining

The Philippine Mining Act of 1995 and the Small Scale Mining Act shall serve as the governing policies in the utilization of mineral resources of the region, aside from consistency with other pertinent policies and regulations such as the Natural Minerals Policy.

The overall framework for mining activities shall be the rational utilization of the region's mineral resources and the mitigation of adverse effects brought about by mining operations. Planning for mineral production must always identify the impacts or costs of such production to other activities and be consistent with the objective of providing fair compensation to those who bear the environmental and other related costs of mineral production. For mineral resources that usually lie underneath the ground, its utilization

shall be guided by the need to know the mineral potential through exploration and periodic review of areas closed to mining through mineral exploration for the purpose of determining whether or not their continued closure is consistent with the national interest and, if warranted, recommend for their reclassification as mineral lands. Mineral production shall be guided primarily by the following:

Identification of potential mining areas within the A&D areas and prioritization of delineated areas for exploration and utilization, provided, that environmental safeguards should be enforced to ensure that the mining activities undertaken have no immediate or long term detrimental effects to the environment;

Strengthening of IEC on the benefits and disadvantages of mining to stakeholders and communities affected by mining activities in the region by concerned agencies, entities, and stakeholders, to include NGOs, POs, IPs and civil society;

Conceptualization of mineral lands and mining production areas as temporary land allocations for purposes of mining operations or mineral land development that may allow multiple land uses even during actual mining activities and, thereafter, again allow other sequential land uses following progressive rehabilitation and environmental restoration;

Promotion of temporary mineral land use/allocation supported by policies espoused under the Mining Act and the National Minerals Policy to promote sustainable development approaches in mining consisting of four components, namely (a) maintenance of environmental quality; (b) promotion of social community stability; (c) preservation of options for future generations; and (d) development of competitive and prosperous mineral industry;

Rehabilitation and restoration of mined-out areas in accordance with the approved Environmental Protection and Enhancement Program, the Abandonment Plan and/or Post Mining Land Use Plan wherein the appropriate sequential land use/s is prescribed;

Reversion, where possible, of mined-out areas to its most suitable and stable state/condition, which can be utilized for recreation, tourism and other uses;

Adoption of best and most sustainable practices taking into consideration the application of environmental management tools (EMTs) for environmental improvements and cleaner production;

Strict adherence to the prescribed application of Environmental Impact Assessment (EIA) and Environmental Risk Assessment (ERA). These tools serve as the government's regulatory framework to ensure that the benefits are highlighted and the adverse impacts are minimized;

Involvement of critical stakeholders' in the monitoring and regular review of mining and mining-related activities;

Consultation conducted directly and indirectly with affected communities affected and keeping them informed from mere application to extraction and post mining operations;

Implementation of a systematic program of public awareness and education to develop an informed public understanding and support for the minerals industry. The pursuit of public awareness and education program contribute to improved decision-making;

Assurance by the LGUs concerned that relevant laws and decisions should go through proper information channels like posting of public notices, conduct of public consultations or public hearings to ensure public participation;

Dissemination of information complied with in order to facilitate the process by which the community shall reach an informed decision on the social acceptability of a mining project as requirement for securing an Environmental

Compliance Certificate. The role of the LGU from the exploration stage to the actual mining activities should also be strengthened and given emphasis;

Recognition of the role of CSOs and business organizations in sustainable development as enunciated in the Philippine Agenda 21 should also be recognized. On their own, CSOs and business organizations are expected to help the communities in enhancing their capability and knowledge to negotiate and decide, and provide them with a non-biased and integrated attitude towards economic, social and environmental impacts of mining activities.

p. Integration of disaster mitigation measures in mining operations

For metallic mineral ore extraction, mine-tailing ponds require technical expertise and years to manage before used water can be safely released to the river systems. This should be made part of the management plan of any mining company and should include operation and post operation mitigation and rehabilitation plans. The location of potential mining areas should also be considered and the impact of possible mining disaster should be strictly assessed vis-à-vis the benefits and advantages of the mining operation. Independent group or groups should do the evaluation where major stakeholders are represented. If after evaluation it is noted that the benefits of the mining operation outweigh the possible impacts of a mining disaster, only then can mining operation be pursued.

q. Harmonizing Mining Activities to the Identified Suitable Land Use of Affected Areas

It shall be the responsibility of the region to promote the rational exploration, development, utilization and conservation of minerals through the combined efforts of government and the private sector in enhancing regional growth effectively, safeguarding the environment and protecting the rights of affected communities. In line with this, the first concern should be to harmonize the different uses of the land so that each land use will complement each other. At present, suitability of land use focuses only on activities undertaken in the land surface. There should therefore be the need to assess underground minerals and determine what is the most suitable use of the land. Exploration for potential mineral areas should therefore be encouraged in order to determine the most suitable use of the land based on environmental sustainability, social preparation and mutual benefits between the private investor and the community. If extraction is found feasible on environmental, social and economic standpoint, the most sustainable approach should be studied and discussed with stakeholders. Identified mineral areas found to have the least impact on the environment during exploration and extraction stage should be prioritized. Mineral extraction, whether metallic or non-metallic, should be done in a most efficient, conscientious and environmentally responsible manner.

Pursuant to Republic Act 8371 or the Indigenous Peoples Rights Act (IPRA) and its implementing rules and regulations, all applications for mining should be accompanied by certification from NCIP, indicating that it is not within the CADC areas. However, should such mining application be within a certified ancestral domain or claimed ancestral domain, a free prior informed consent is necessary through a corresponding Memorandum of Agreement.

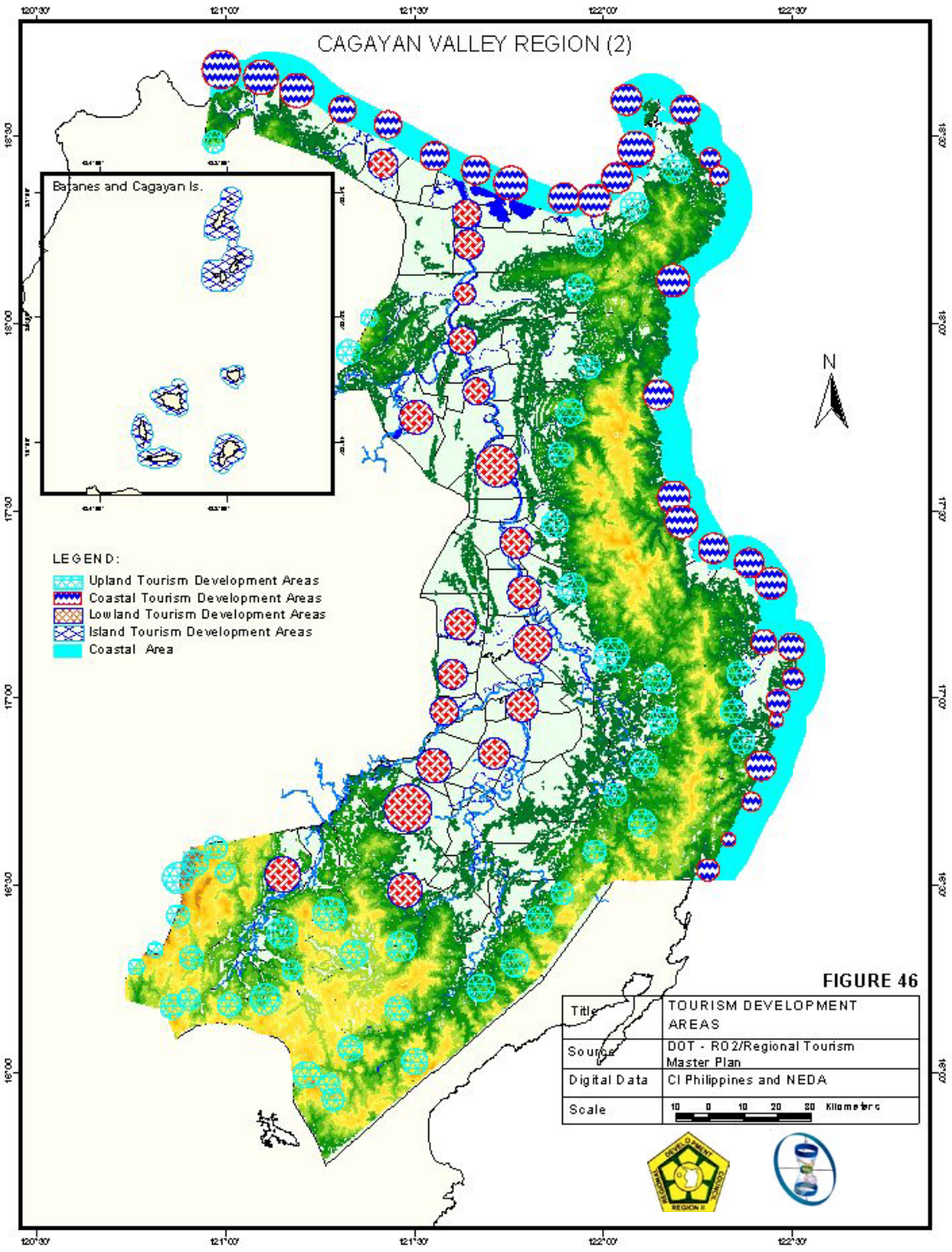


FIGURE 46: TOURISM DEVELOPMENT ZONES

r. Promotion of environment-friendly tourism development in the region

Priority sites for Tourism Development will be the areas identified in the national and regional tourism master plans as well as those designated through legislative and executive

issuances. The development of tourism areas (***Figure 46***) will be pursued in support of the strategy to encourage investments inflow in the region. Particularly the region will give priority to the following:

Promotion of agri-tourism that will showcase the region's significant accomplishments in agriculture;
Promotion of cultural tourism in the region's historical, religious, archaeological and significant man-made structures;
Development of coastal and island tourism that will highlight scuba-diving, game fishing, coral viewing, surfing, whale/dolphin watching, mangrove canopy walk ,bird watching, snorkeling and beach swimming;
Development of Cagayan Riverine Tourism that will offer river fishing, boat rides, kayaking and other integrated eco-tourism activities in the region;
Strengthening upland tourism that will exhibit the region's magnificent caves, verdant secondary growth forests, national parks and wildlife sanctuaries. It is in the upland tourism that the following activities are encouraged: spelunking, bird watching, canopy walk, climbing/rappelling, forest exploration and wilderness camping;
Strengthening collaboration with adjacent regions for the identification, clustering and promotion of eco-tourism packages; and
Preservation of Indigenous cultures and traditions.

Tourism development as an economic activity shall ensure linkages with other sectors. This will further stimulate production, generating employment and encouraging private sector investments in the region.

3.2 Protection Land Use

While the "parallel growth spatial strategy" recognizes agri-industrialization, environmental protection will also be taken into account. This is to ensure that a balance between economic development and environmental integrity is achieved and sustained. Areas declared as NIPAS (natural parks, proclaimed watersheds, landscapes and seascapes), areas outside NIPAS that require protection because of their distinctive physical features, anthropological significance, historical and educational value, biodiversity rich areas, and areas prone to natural hazards will be considered an integral part of the protected areas in the region. While some of these areas will also serve as critical sources of water and indigenous energy, its development for such activities will be undertaken only if the desired environmental equilibrium is adhered.

The areas subject for protection are the following: declared NIPAS areas (natural parks, proclaimed watersheds, landscapes and seascapes), areas outside NIPAS (because of their distinctive physical features, anthropological significance, historical and educational value), old growth forests, mossy and pine forests, existing forest reservations, biodiversity conservation areas, areas with slope more 50 percent and elevation more

than 1,000 meters above sea level, areas prone to natural and geologic hazards, and the 20 - meter strip embankment of riverbodies in rural areas and 6 meters in urban areas.

3.2.1 GOAL:

Protect and maintain environmental integrity thru conservation, preservation and rehabilitation of natural resources.

3.2.2 OBJECTIVES

To reduce and control the incidence of human intrusion and exploitation activities in protected areas of the region;
To effectively manage and control the degradation of the environment;

3.2.3 POLICIES AND STRATEGIES

a. Ground Delineation of Protected Lands and other Significant Areas

The ground delineation of critical areas shall be a primary concern within the plan period and shall be guided by the following strategies and priorities:

Demarcation of the boundaries of forest areas on the ground to facilitate their protection and management. While forest areas have been mapped out on the ground in the province of Quirino and Isabela, other provinces of the region still have to complete ground delineation of their respective forest areas. The completion of the ground delineation of forest areas will be the rallying point for the resolution of most environmental planning issues. The delineation to be made should be without prejudice to the provisions of the NIPAS Act and the IPRA Law;
Completion of ground delineation through the establishment of concrete monuments, road or infrastructure or any other visible, permanent and practicable signs;
Physical Delineation and demarcation of forest areas should to determine NIPAS and non-NIPAS areas. Once protected areas are demarcated, systematic assessment and survey should be undertaken in order to further define their use and management. Appropriate measures can be implemented to manage the region's protection areas. Non-NIPAS areas, which can be rehabilitated and restored to its original state, can be categorized for inclusion under the NIPAS;
Involvement of LGUs in the validation and resolution of possible delineation process conflicts to ensure effectiveness of demarcation;
Conduct of review of theoretical maps in comparison with actual watershed areas for proper classification and delineation of watersheds according to their state and threats as well as the identification of rehabilitation programs needed;
Identification, mapping-out and dissemination to the public, particularly the high-risk communities of areas prone to natural hazards such as earthquakes, floods, and landslides. The identification and mapping of hazard prone areas should involve the local governments. The decision on whether an area should be considered as high-risk and hazard-prone requires strong coordination with concerned national agencies e.g. PHILVOCS, DENR-MGB, PAGASA, NDCC, among others;
Mapping-out, delineation and subjecting to protection easements along rivers. The 20-meter buffer from the riverbank in rural areas and 5 meters in urban areas shall be developed for structural and non-structural erosion control measures.

Economic activities should be strictly regulated along this buffer and settlements should be restricted. Tree rows or hedgerows should be developed along river banks as an effective erosion control measure.

b. Proclamation of all Watersheds and Key Biodiversity Areas

As a result of forest ground delineation and assessment, all critical watersheds, regardless of its present state and level of interventions needed, and potential key biodiversity rich areas shall be further delineated and supported with the corresponding national and local executive or legislative action for its protection (***Figure 47***). The concerned agencies and LGUs shall coordinate with the proper channels for the official proclamation of additional watershed areas including those initially identified by the DENR for protection purposes. Specifically, the following should guide local planning for watersheds and biodiversity rich areas:

Identification and delineation of all possible additional watershed areas in order to widen the scope of protection and management. Such activity or concern should be initiated by the LGUs with assistance from the concerned agencies. This should include assessment of the status of all existing watersheds. All proclaimed watersheds are also expected to be assessed vis-à-vis the implementation of their respective management plans. This will determine the level of interventions needed for all watersheds in the region;

Complementation of policies and regulations at all levels of the bureaucracy which should be supported by community participation in order for protection and rehabilitation to become viable;

Strict protection of all watersheds that are considered intact and rehabilitation of degraded watersheds;

Full coordination between the LGUs and the POs or other entities for the development and management of watershed within their jurisdiction. The foremost intervention needed for watershed areas is protection and rehabilitation;

Primary consideration and concern for the protection of watershed in case of conflicts or overlaps with other land uses, whether such watershed areas are categorized within NIPAS and non-NIPAS areas.

c. Preparation and Implementation of Sustainable and Integrated Management Plan in all Watershed Areas and Critical Protected Areas

The management and development of watershed should be designed and implemented through an integrated and wholistic sustainable approach, focusing on the resource and the people directly involved in its management.

Watershed areas, whether with or without proclamation, should have corresponding watershed management plans. The formulation of Integrated Watershed Management Plans will serve as guide for the LGUs and other stakeholders in implementing critical interventions for the region's watershed areas. The formulation of these plans should be anchored on the following principles and strategies:

Enhancement of LGUs' role in watershed management through the adoption of Forestry Land Use Plans. This is consistent with the need to directly involve the

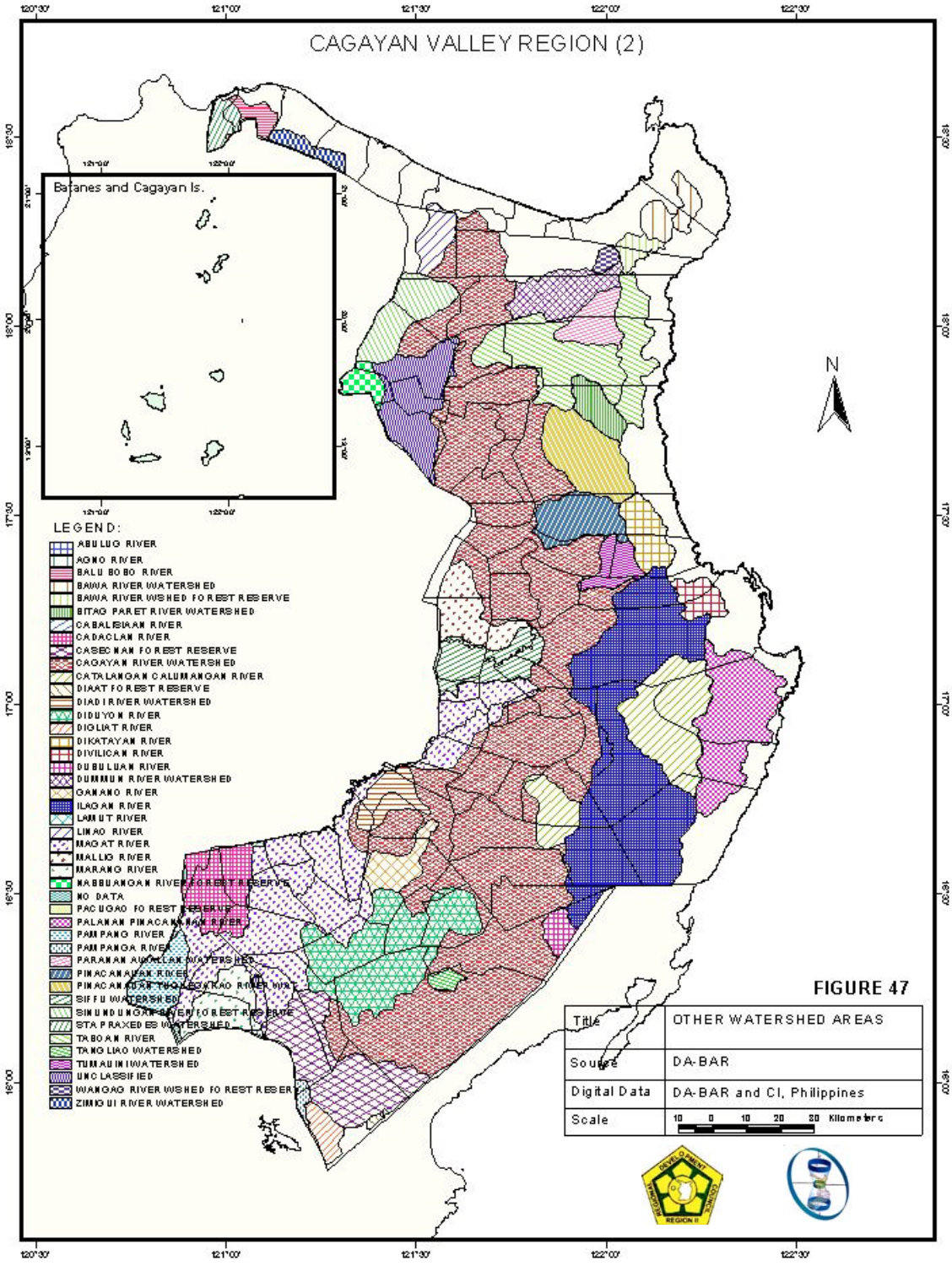


FIGURE 47: WATERSHED AREAS MAP

LGUs in joint undertakings with concerned agencies and other LGUs in the management of watersheds within their jurisdiction;
Complementary management strategy/approach in the management, development and rehabilitation of watershed areas through stronger linkage and cooperation between DENR, concerned agencies, and LGUs in the region. The same approach i.e., complementary management, shall be adopted in interregional watershed areas;
Management of watersheds within boundaries with other regions which shall be guided by the Watershed Management Plan jointly prepared by concerned regions;
Strong resource complementation within the different services in the DENR to address funding constraints;
Encouragement of development program/projects which are not necessarily within the direct umbrella of watershed program, but which have direct or indirect significant complementation in so far as the objective of watershed management is concerned, i.e. RRMP, NFP, Grow a Tree for Legacy, Socialized IFMA and the like;
Advocacy on watershed's critical role and significance; and
Packaging of watershed development and rehabilitation projects and offering these for funding assistance to financing institutions here and abroad.

d. Protection and Conservation of Biodiversity-rich Areas

Biodiversity-rich areas should be the priority subject of protection and conservation initiatives while those requiring rehabilitation should be accorded the necessary interventions to restore them to their original state (***Figure 48***). Considered as critical activities and strategies that need to be implemented are:

Ground delineation of all biodiversity-rich areas;
Implementation of existing policies and regulations at the local level such as the Fisheries Code, the NIPAs Act, the IPRA law, the Forestry Code, among others;
Formulation of support policies and regulations to further strengthen the protection of the remaining biodiversity-rich areas of the region; and
Community participation and support of the concerned local government units is critical;

e. Regulation and Restriction of Activities in Upland Areas

The framework for regulation shall apply in production forest areas while restriction shall apply on delineated protected forest areas. Activities in the upland areas shall be guided by the following strategies:

Restriction of the further migration to forest protection areas. CADCs within upland protected areas should come up with management plans to regulate in-migration within delineated CADC areas. Parallel to this, LGUs should develop monitoring mechanisms based on management plans of CADC areas while CADC communities should likewise report regularly any intrusion or illegal settlements within the CADC areas. Upland protected areas outside of the CADC areas should be classified as restricted areas. Corresponding punitive measures shall be imposed on any violation to prevent the human intrusion into forest protected areas;

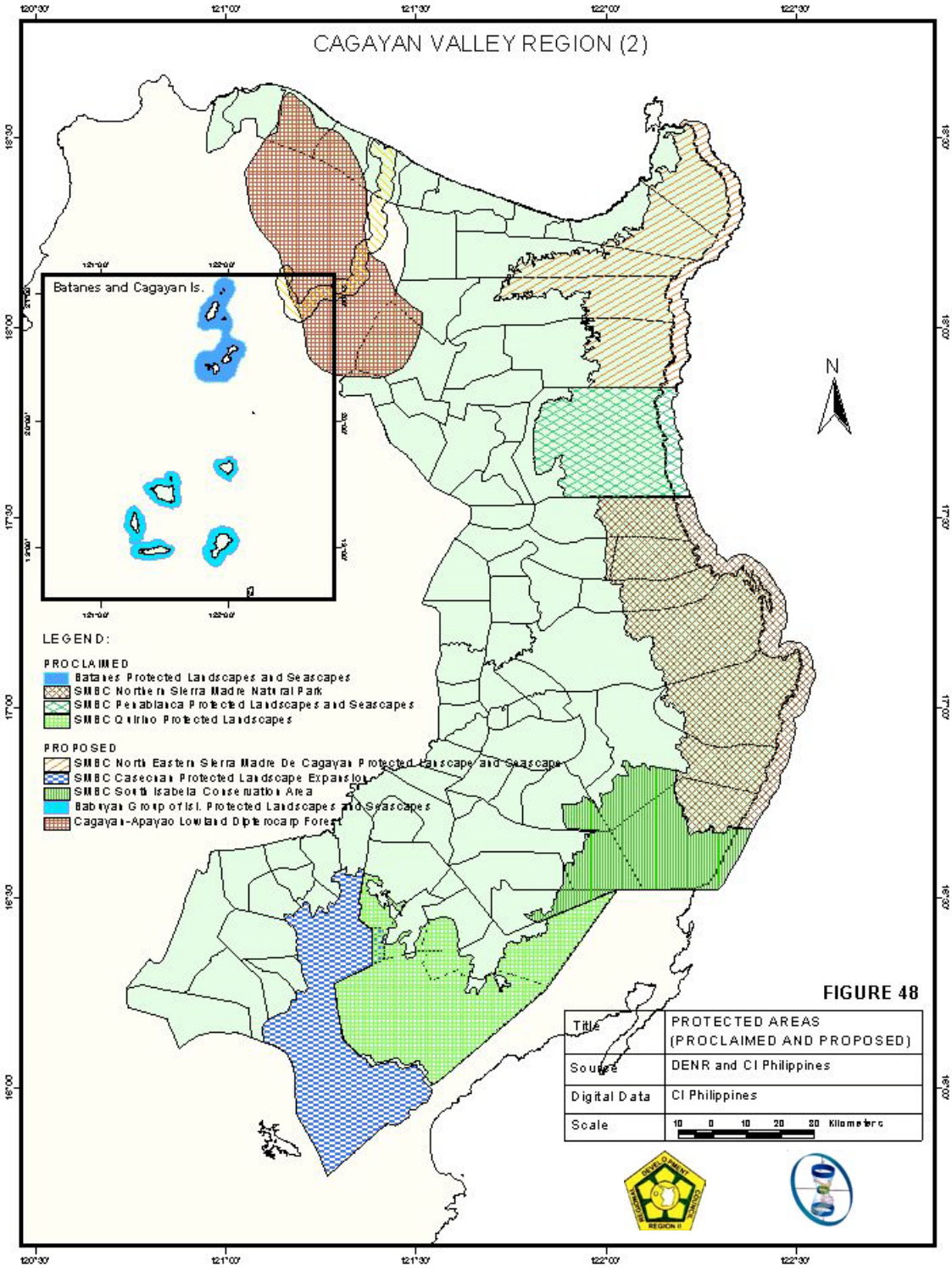


FIGURE 48: PROTECTED AREAS, PROCLAIMED AND PROPOSED

Regulation by Local Government Units of activities in upland areas that are outside but proximate to the forest protected areas. Economic activities such as slash and burn farming, carabao logging and hunting are strictly prohibited in protected areas except the conduct of researches or scientific studies related to environmental conservation and management and reforestation projects in highly degraded areas;

Involvement of upland communities in the rehabilitation, restoration and management of degraded areas and channeling their attention from extraction to protection. Proper intervention for the regeneration of logged over areas or areas converted to slash-and-burn farming shall also be provided;

Adoption and institutionalization of sustainable practices and erosion control measures in agriculture particularly in upland farming communities outside of the protected areas. All erosion prone upland areas should be assessed in order that location-specific mitigation measures can be formulated;

Monitoring CBFM, SIFMA and IFMA beneficiaries in the upland against possible intrusion into forest protected areas as well as instituting the use of the forestry production instrument to legitimize extraction; and

Channeling rehabilitation funding on joint arrangements with civil society groups who are seen as effective partners in environmental conservation.

Identification of brushland and grassland areas and optimization of their utilization

The grassland and brushland areas of the region are located in both forest and A&D areas. Grassland and brushland areas within the A&D areas can be developed by private owners for possible crops expansion or livestock production area. Grassland and brushland areas within the forest areas are further classified according to location, those within the production forest and within the protected forest. In both cases, restrictions and regulation for their uses are still necessary, hence, the following strategies:

Identification of brush land and grassland areas, determination of land suitability and optimization of their corresponding utilization. However, for grassland and brushland within the strict protection zones, intervention should be in the form of reforestation or natural regeneration;

Involvement of the LGUs (provincial and municipal level) in the identification and demarcation of existing grasslands and brushlands to assess their most suitable use;

Incorporation of grassland and brush land areas in the Comprehensive Land Use Plans (CLUPs) of concerned LGUs and passing corresponding ordinances to encourage the rational and judicious use of such lands;

Encouraging utilization of idle A&D grassland and brush land areas by their owners, through the provision by concerned LGUs of incentives, interventions or other schemes (i.e. long-term lease agreement, etc.);

Optimization of the sustainable use of idle grassland within the forest area through the coordination of LGUs with the concerned agencies. The concerned LGUs may seek for the reclassification to A&D and subject the same to agrarian for distribution to qualified beneficiaries within the locality; and

Preparation of an Integrated Management Plan on brushland and grassland by concerned agencies i.e., DENR, DA and DAR.

g. Formulation of Ancestral Domain Sustainable Development Protection Plan (ADSDPP) for All Identified CADC Areas

All CADC areas should be supported with management plans that are consistent with existing relevant laws and policies. In the formulation of the management plans, critical stakeholders should be involved and direct implementors and beneficiaries of the plan should be apprised of their respective roles and responsibilities.

h. Integration of High Risk and Hazard Prone Areas in Settlement, Production and Infrastructure Planning

Disaster mitigation should be integrated in planning for settlements, production and infrastructure especially at the local level. This includes restricting fault line easements to open space and limited recreation activities; allowing agricultural production but not settlement activities in permanent danger zones; limiting other danger zones to tourism and scientific research activities, and planning and implementation of appropriate mitigation technologies (e.g. mangroves, tree line and earth dikes prone to storm surges), among others.

3.3 Settlements Plan

Settlements are generally categorized into two types; urban areas including cities and provincial capitals that provide services to surrounding municipalities, and rural areas that serve as the region's food production base. For settlements development, "parallel growth" invokes providing the distinct requirements of both the urban and rural areas in terms of access to social and economic services. It also calls for the enhancement of internal as well as external settlement linkages to further improve local production as well as enhance domestic, interregional, national and foreign market access. The strategy will push for the establishment of closely linked agri-industrial centers and will look forward to strengthen markets outside the region specifically in adjacent regions and global market. The strategy also calls for appropriate planning to effectively regulate population settlements as against the present practice of sporadic settlement development in the region (***Figure 49***).

The region's Service Zones are those that provide support services such as financial, institutional, commercial and tourism, settlements development and urbanization which are seen as the major challenges that should be addressed during the Plan period. These settlements will be encouraged to strengthen their capacity to absorb additional population through urban expansion or planning for metropolitan growth and clustering of adjoining municipalities. Additional space requirements for settlements will be provided through the promotion of vertical settlements expansion especially in urban areas and cities. On the other hand, rural areas shall be provided with quality basic services and support facilities in order to catalyze their development and serve their purpose as the region's production base. Location and expansion of settlements will be guided by the concept of "concentration" or the location of settlements expansion within town or barangay centers for better access to social and economic services.

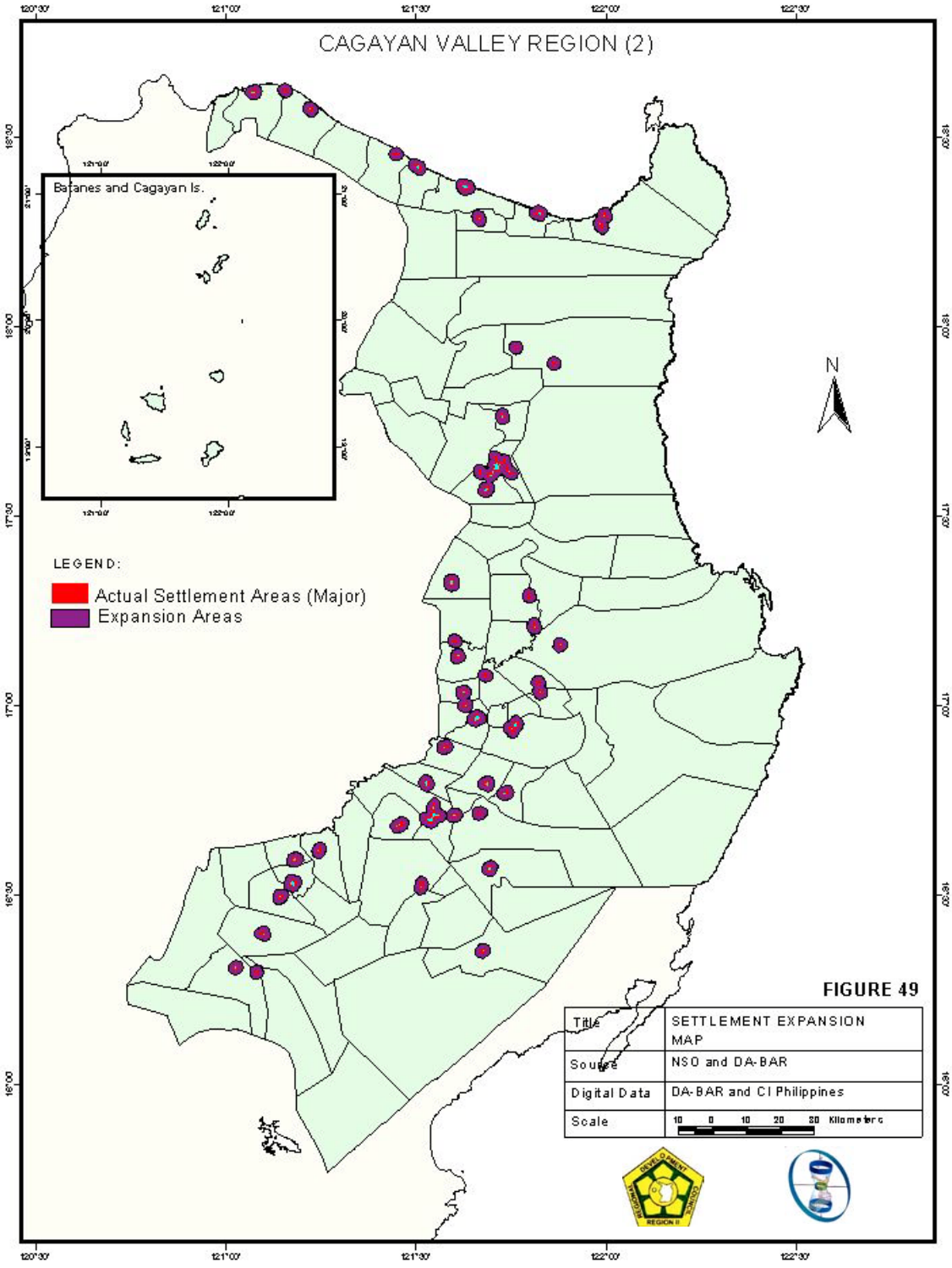


FIGURE 49: SETTLEMENT EXPANSION MAP

3.3.1 GOAL:

Rationalize the distribution of population to increase access to adequate quality social services, economic opportunities and benefits.

3.3.2 OBJECTIVES

To effectively regulate/implement zoning ordinances and other land use policies;
To provide equitable access of populace to economic opportunities and quality social services.

3.3.3 POLICIES AND STRATEGIES

a. Strict enforcement of national legislations on environmental management

Several legislations concerning environmental resource use and management have already been promulgated by the government to ensure environmental integrity. These legislations serve as the overall framework for national government agencies and local government units to accomplish their respective mandates on environmental management. Towards this end, the strategies that support this policy include the following:

Implementation of the provision of RA 8749, otherwise known as "The Philippine Clean Air Act of 1999" from the regional to the sub-regional and sub-provincial levels. This carries out the national policy of balancing development and environmental protection through the pursuance of the framework of sustainable development. It lays down the powers and functions of the Department of Environment and Natural Resources (DENR), Department of Transportation and Communication (DOTC), the Department of Trade and Industry (DTI), the Department of Energy (DOE) and all other concerned agencies. It also considers the rights and obligations of stakeholders as well as the rights and duties of the people with respect to air quality and management.

Implementation of the provision of RA 9003, otherwise known as the "Ecological Solid Waste Management Act". The same act provides for an ecological solid waste management program; creates necessary institutional mechanisms and incentives; declares certain acts prohibited, and provides corresponding penalties for violations. The law prohibits the use of open dump sites and requires an Environmental Compliance Certificate and other permits and clearances from concerned agencies for the construction of solid waste management facilities. With RA 9003, the local government units should take the lead role in the establishment of proper waste disposal systems in their respective jurisdictions. Since solid waste disposal concerns all cities and municipalities, particularly the urban and urbanizing areas, adjoining LGUs should explore the strategy of having a cluster approach in waste disposal management.

b. Strengthening of interregional linkages

The establishment of agri-based industries and industrial centers shall be in consideration of the potential market outside the region. The region as a top and surplus grains producer will be promoted to local and foreign investors for the envisioned establishment

of closely linked agri-industries in the region. The immediate market link to be considered shall be Metro Manila and adjacent regions i.e . Regions I, 3 and CAR and eventually the ASEAN Region. This policy will entail the needed infrastructure support specifically transport (land, sea and air) and communication. Enhancing linkages with other regions shall be guided by the following strategies:

Coordination with the North Luzon Quadrangle Growth Area (NLQGA) to ensure the complementation of the Region 2's Development Plan with the North Luzon Growth Area;
Ensuring the complementation of Region 2 with adjacent regions i.e., Regions I, 2, 3 and CAR; and
Promotion of interregional collaboration in the development of common resources and potentials i.e., Coastal Tourism with Region I, Upland Tourism with CAR and Eco-Tourism with Region 3.

c. Promotion of further growth of regional and sub-regional urban centers

This policy shall adopt the national spatial strategy of "national dispersion through regional concentration" which calls for the development of dispersed but closely linked system of regional urban centers. This strategy will be operationalized at the regional level through the promotion of the growth of regional as well as sub-regional urban centers to cater to the region's development requirements at a regional and sub-regional scale. Strategies to push for the development of these centers shall include the following:

Identification and promotion of specific urban centers to be developed which will depend on their potential for a long-term growth and urbanization sustainability, local initiatives and the potentials of such area to assume a desired functional role in the region's network of settlements;
Improvement of local planning strategies to accommodate long-term growth and considerably fast rate of urbanization in these regional and sub-regional centers; and
Provision of higher level facilities and services which shall be prioritized in these areas to support their functional role in the region.

d. Improvement of the urban-rural linkages

Alongside the promotion of the strengthening and further growth of regional and sub-regional urban centers, the existing linkage between urban and rural areas shall also be strengthened. The integration of the rural and the urban economy is expected to lead to a more equitable distribution of services and facilities that will ultimately result to an improved rural productivity and production levels, expansion of access to market, and increased rural income.

Further, a more progressive rural economy would translate to a stable supply of food and raw material requirements for the urban areas thereby establishing the much desired urban-rural linkage and complementation. Strategies to operationalize this policy shall include:

Provision of education facilities particularly primary schools in priority school-less barangays;

Provision of rural health services in farflung communities including hard-to-reach areas,coastal municipalities and barangays;
Strengthening accessibility of IP settlements/communities to social facilities and services;
Improvement of the physical and social access of rural communities to basic services and facilities;
Improvement of local planning to encourage strategic sites of settlements in rural areas; and
Provision of reliable transportation and communication facilities to connect island, upland and far-flung municipalities and barangays to the mainstream of regional or sub-regional economic activities;

e. Promotion of clustering or aggrupation arrangements among contiguous local government units

Local governments are encouraged to explore and initiate clustering or an aggrupation arrangements with their nearby cities and municipalities. With such arrangements, member - LGUs are able to address common problems on settlements developments and requirement, significantly optimize the use of land resources aside from the prospects of improving the delivery of basic services and enhancing the flow of people and economic activities among local governments. This basically involves the preparation of an integrated plan for the whole cluster area, in consideration of the individual plans and development concerns of the member LGUs. To augment the lacking 1,511 hospital bed (2030 requirement) in the region, the bulk of which are in the provinces of Cagayan (306) and Isabela (898), strategic locations within metro areas will be considered in locating these facilities.

Among the critical activities and strategies to promote clustering or aggrupation arrangements among LGUs are as follows:

Advocacy and dissemination of the benefits of clustering arrangements to local executives and policy makers for them to better appreciate the gains derived from engaging in clustering arrangements;
Provision of technical assistance by concerned national and regional line agencies in the area of integrated/inter-LGU physical and development planning, development administration and project development;
Provision of funding support by national, provincial and local governments for plan preparation, project development and implementation of priority programs and projects;
Promotion and institutionalization of inter-LGU consultation in the process of the preparation of physical and socio-economic development plans, policy formulation and program/project identification and implementation in order to synchronize and harmonize the individual development undertakings of neighboring LGUs

f. Strict enforcement of approved local land use plans and zoning ordinances

As mandated in RA 7160 or the Local Government Code of 1991, LGUs shall continue to prepare and update their comprehensive land use plans (CLUPs), and enact these through zoning ordinances as bases for their development directions. The issue on the

incompatible use of land will be addressed primarily by the strict implementation of zoning ordinances. National laws and directives will guide the local governments in ensuring the judicious utilization and protection of lands and other natural resources. Coordination between Local Government Units (LGUs) and concerned National Government Agencies will be strengthened in the implementation of environmental laws and policies specifically local ordinance.

Land use and infrastructure planning should be done in such a way that SAFDZs are not threatened and treated as residuals of land using activities. While conflicts with other land uses are unavoidable, especially as settlements grow and expand, these should be minimized and mitigated by: a) aligning roads and other infrastructures to reduce conversion and environmental pressure on SAFDZs; b) designating the use of adjacent areas for agro-industries or other activities complementing agriculture; c) providing sufficient buffer zones between intense land uses and SAFDZ boundaries, and d) creating fiscal and other incentives to promote SAFDZ market viability.

g. Efficient management of urban land

Increases in urban population imply a need for the provision of urban land for housing and other purposes. This policy advocates for the rationalization of the use or urban land in consideration of the future needs of urban growth. Specific strategies to efficiently manage the region's stock of land in urban and urbanizing areas include the following:

Identification and allocation of land exclusively for socialized housing by local governments as provided for in RA 7279 otherwise known as the "Urban Development and Housing Act" and which provides for a comprehensive and continuing urban development and housing ;

Delineation of areas suitable for residential purposes, industry development, commercial districts, recreational and institutional facilities;

Adoption of higher density residential developments for areas within or peripheral to Central Business Districts (CBDs) of urban or urbanizing cities/municipalities;

Identification of disaster prone and other environmentally critical areas to reduce safety risks for settlements; and

Identification of land with potentials for urban expansion.

h. Mitigation of environmental degradation in urban areas through local governance.

Local governments and communities themselves should exercise an active involvement in the management of the urban environment. The increased participation of local governments is inevitable given the devolution of responsibilities on environment and natural resource management through the local government code (LGC). Among the specific strategies which local governments in cooperation with the communities should undetake are as follows:

Incorporation of environmental considerations and principles in urban planning processes and management;

Delineation of land available for and those restricted from settlements expansion;

Establishment of urban forestry program;

Establishment and/or strengthening of mechanisms for the involvement of civil organizations and the community in environmental management;

Adoption of "polluters pay" policy to ensure that those responsible for environmental pollution share in the financial burden of mitigating the effect of pollution and in restoring environmental integrity;
Pushing for the minimization of waste through the enforcement of RA 9003 at the community level;
Enforcement and monitoring of compliance to environmental standards and regulations.

i. Provision in the rural areas of adequate infrastructure support facilities, appropriate technology extension services and quality basic social services to increase rural production and productivity levels

The infusion of adequate development interventions in rural areas is necessary to attain a more vibrant rural economy, generate substantial employment opportunities, increase income from agriculture–based activities, upgrade the status of life and control unnecessary rural to urban migration. Among the services that need substantial intervention in rural settlements are: a) agriculture – support infrastructures, b) technology extension and c) basic services along education, health and sanitation and social welfare.

To do this, the following specific strategies are recommended:

Prioritization and refocusing of resources for underserved and marginalized areas;
Establishment of data base for supply – demand gaps for basic services; and
Attainment of convergence of government and private sector efforts in the delivery of development interventions at the community level

i. Planning for growth in consideration of population concerns

Given the interrelationship of population and development, the Plan has adopted a moderately declining population growth rate for the region characterized by a decreasing fertility rate, an increasing life expectancy and a decelerating out-migration pattern. This will be achieved by promoting the integration of population concerns and variables in all development processes in the region.

The LGUs are encouraged to strengthen their population management programs taking into consideration the cultural, economic, religious and sustainable development concerns of their respective localities.

3.4 Infrastructure Plan

The Infrastructure Plan Component is primarily aimed at supporting the settlements plan and the land use (production and protection) plan components in the operationalization of the spatial strategy ("Parallel Growth Development Strategy) and attainment of the RPFP vision.

In terms of infrastructure support, "parallel development" will enable infrastructure to stimulate growth as well as help in the preservation of protection areas. The spatial strategy also allows the sector to provide the necessary facilities and utilities to support production, consumption and service activities to take place. It involves the physical

linking of the activities of the production, protection and settlements components of the RPFP. Specifically, its support to the production land use component shall be in terms of providing basic infrastructure and physical access to production sources and markets, establishing intra and inter-regional economic linkages as well as supporting the requirements of industrial and eco-tourism areas.

On settlements development, infrastructure support will be in terms of providing the basic services needed in urban and rural settlements. It will also help ensure the functional integration between and among production and service-oriented settlements of the region. On protection land use, the infrastructure will help protect settlements from hazards by mitigating the impact of natural calamities as well as ensuring that infrastructure projects will not indirectly or directly cause undue harm to the region's protection areas.

3.4.1 GOAL:

Provision of adequate, safe and reliable infrastructure facilities and utilities to support the requirements of regional economy while maintaining ecological balance.

3.4.2 OBJECTIVES

3.4.2.1 Transport

To link the islands and other remote communities with the urban centers and production areas in the region
To modernize and expand existing Port facilities to accommodate inter-island transport, upgrade strategic fish-ports/fish-landings and construct new ones to encourage economic activities;
To upgrade and expand airport facilities and modernize air transport equipment to cater to bigger aircrafts and increase flight frequencies; and
To develop the Cagayan River as an alternate transport route.

3.4.2.2 Communications

To provide efficient, reliable, accessible services at par with global standards.

Power

To implement synergy program to serve missionary and off-grid areas; and
To improve service delivery of existing distribution systems to meet the growing demand for power.

3.4.2.4 Water Resources

To expand irrigation service coverage to target areas;
To adopt an integrated and coordinated water resources management plan for the region; and
To further develop and harness the water resources of Cagayan Valley Riverine System for irrigation purposes.

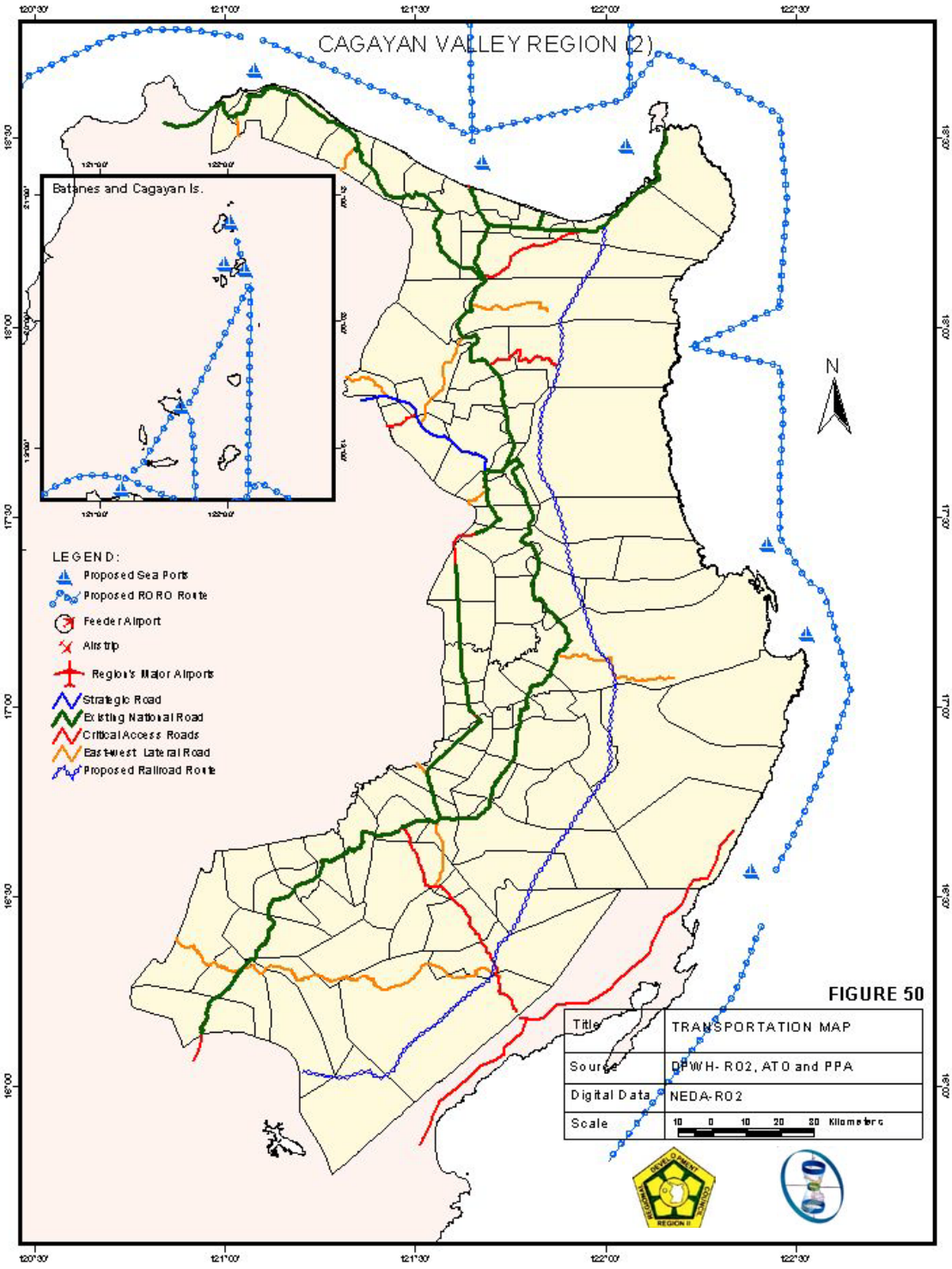


FIGURE 50: TRANSPORTATION MAP

3.4.3 POLICIES AND STRATEGIES

3.4.3.1 Trasnport

a. Promotion of an inter and intra-regional transportation system thru the following:

Development of alternate routes in and out of the region;
Upgrading of the Cagayan Valley road and lateral roads especially within urban and built-up areas;
Supporting the main trunkline of the region through the development of the Cagayan River Transport System;
Construction of new roads that are of strategic importance to local development and for purposes of decongesting urban areas;
Provision of road network connecting rural production areas to urban centers;
Putting emphasis on environmental and social concerns in infrastructure planning and development;
Adoption of public-private partnerships (PPPs) in infrastructure planning and development:
Promotion of transport system in buit-up areas to regulate the flow of traffic specially in highly congested urban areas in the region.

b. Delegation of the maintenance, rehabilitation and upgrading of roads to the LGUs

The policy is covered under R. A. 8174- "Delegation of Project Implementation under the DPWH Budget in the GAA " with "Implementing Rules and Regulations (IRR) under DPWH Dept. Order No. 9, Series of 1996."

The implementation of R. A. 8174 is consistent with the New Local Government Act of 1991 providing devolution of selected NGA functions to LGUs. This would provide for a more efficient maintenance of national and local roads within the areas of jurisdiction of the local governments. The devolution of the maintenance of national roads shall go hand in hand with the corresponding funding requirement. Specific strategies include:

Promotion of extensive technology transfer and technical capability building to LGUs;
LGU financing of the modernization and maintenance of local road networks

c. Incorporation of disaster mitigation principles in transportation network development

Measures to avoid or mitigate the destructive effects of natural hazards to the population and infrastructure facilities should be taken as primary consideration in identifying and planning for transport development in the region. These include:

Ensuring that technical designs of road development will be in line with the geographic configurations of the generally rolling terrains of the Cagayan Valley Region;
Planning for road development should be consider distance from fault zones and flood-prone areas;

Re-routing of existing roads traversing fault zones and flood-prone areas; and
Improvement and regular maintenance of slope bank protection through spur dikes, ripraps, and other flood control structures.

3.4.3.2 Commuication

a. Provision of universal access to telecom facilities

This policy aims to broaden regional access to quality postal and telecommunication services. It involves the establishment of communication links to unserved and underserved areas, particularly the island, upland and far-flung areas of the region. While digital and mobile telecommunications can now be availed of in several urban and urbanizing cities/municipalities, interruptions and disconnections continue to persist which hamper fast exchange of communication between parties. Thus, the policy also covers the further expansion and upgrading of existing communication facilities to hasten the development of urban and urbanizing areas. Support strategies along communications development are as follows:

Distribution of telecom services to non-profitable areas;
Mandatory interconnection among telecom providers;
Regular updating of telephone roll-out commitments;
Establishment of strategically-located cell-sites;
Private sector participation in communications development planning;

3.4.3.3 Power

a. Optimum utilization of indigenous energy sources

The region's indigenous energy resource potentials should be developed and utilized to support regional as well as national development. Energy resource development efforts will focus on those that offer the potential of generating electricity at affordable cost and of reaching the upland, island and far-flung communities. Local energy development should be made compatible with the regional policy of sustainable development. Thus, energy projects in the region will be limited to those that will not threaten the region's NIPAs and other protection areas or will not cause undue harm to the environment. The following specific strategies will hasten the development of the region's indigenous energy resources

Promotion of the region's potential indigenous energy sources to prospective investors; and
Exploration of potential energy sources, giving priority to renewable sources such as natural gas, dendro-thermal, etc.

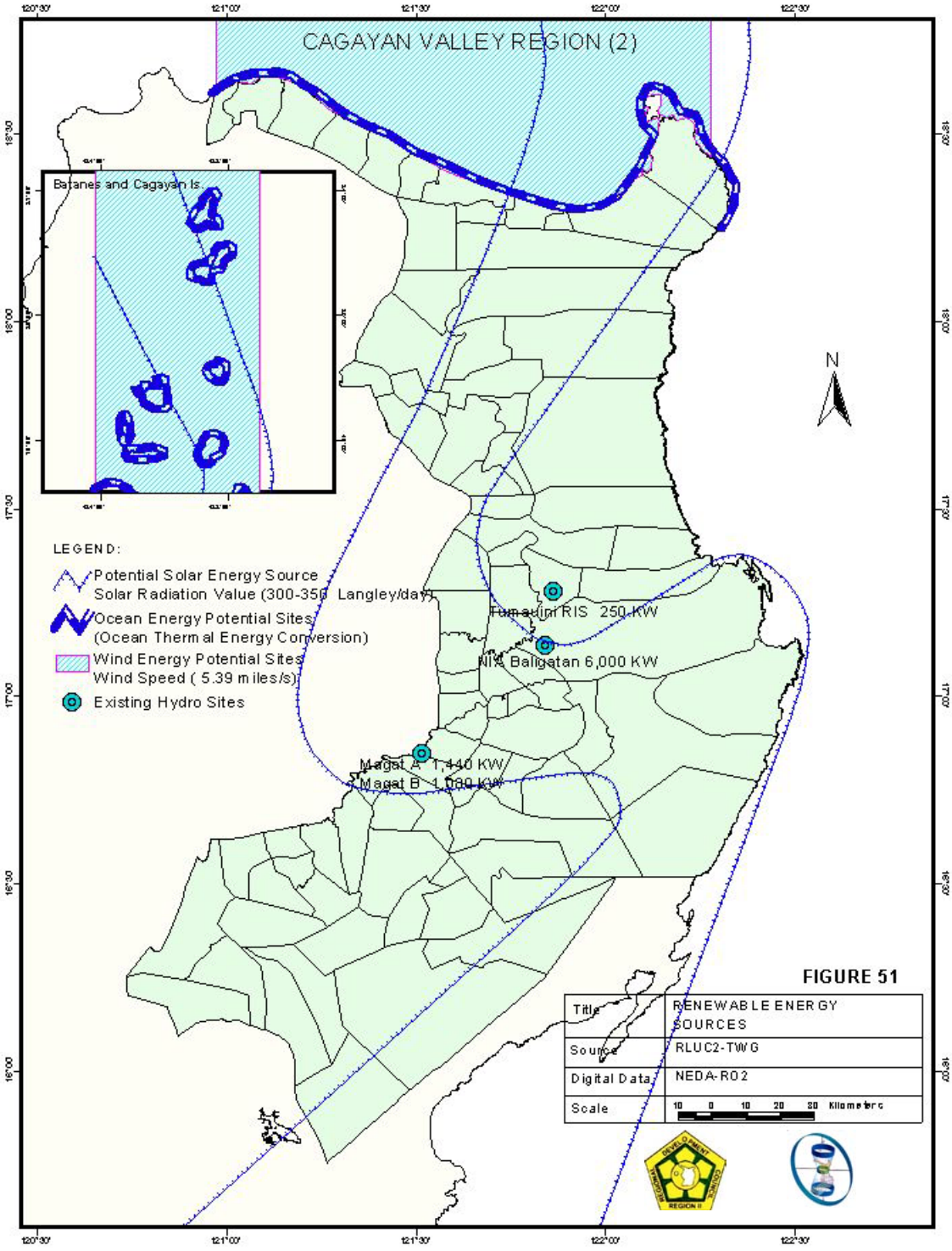


FIGURE 51: RENEWABLE ENERGY SOURCES MAP

b. Accelerating pace of rural electrification

Alternative and indigenous sources of power shall be adopted to address the problem of providing power to remote areas that cannot be connected to the main power transmission lines. Specifically, rural electrification will be undertaken through:

Installation of Solar Home Systems Distribution Project (SHSDP), Micro Hydro-Power Projects (MHPP) and other feasible indigenous power sources to service remote areas and barangays; and
Upgrading of the efficiency of power transmission and distribution through the improvement and regular maintenance of power transmission and distribution lines.

3.4.3.4 Water Resource

a. Adoption of an integrated and coordinated water resource management

For a more rational planning of water resource development in the region, there is an urgent need to address water resource management from a sector approach to an integrated and coordinated water resource management. This is to provide synchronized efforts in the development of the water resources of the Cagayan Riverine System, specifically through:

Strengthening inter-agency coordination for effective implementation and monitoring of existing rules and regulations concerning water resource utilization and development;
Strict adherence to the protection of watershed and forest areas in planning and implementation of projects involving water resources; and
Giving due consideration to the support requirements of Strategic Agro and Fishery Development Zones (SAFDZs) in planning and implementation of water resource projects.

b. Expansion of irrigation service coverage

The expansion of the existing irrigation coverage is the sub-sector's main thrust given the region's vast agricultural resource potentials that remain underutilized due to the absence of support irrigation facilities. It is also recognizes that the efforts of the national government on irrigation development need the complementary support of local governments and the community in order to expedite the region's irrigation development program. The specific strategies to significantly increase irrigation coverage are as follows:

Improvement of the operation of existing irrigation systems;
Optimum community participation through organized and federated farmers' irrigators' associations;
Establishment of communal irrigation systems through counterpart funding support from the local governments; and
Identification and implementation of irrigation projects in due consideration of the requirements of the SAFDZs.

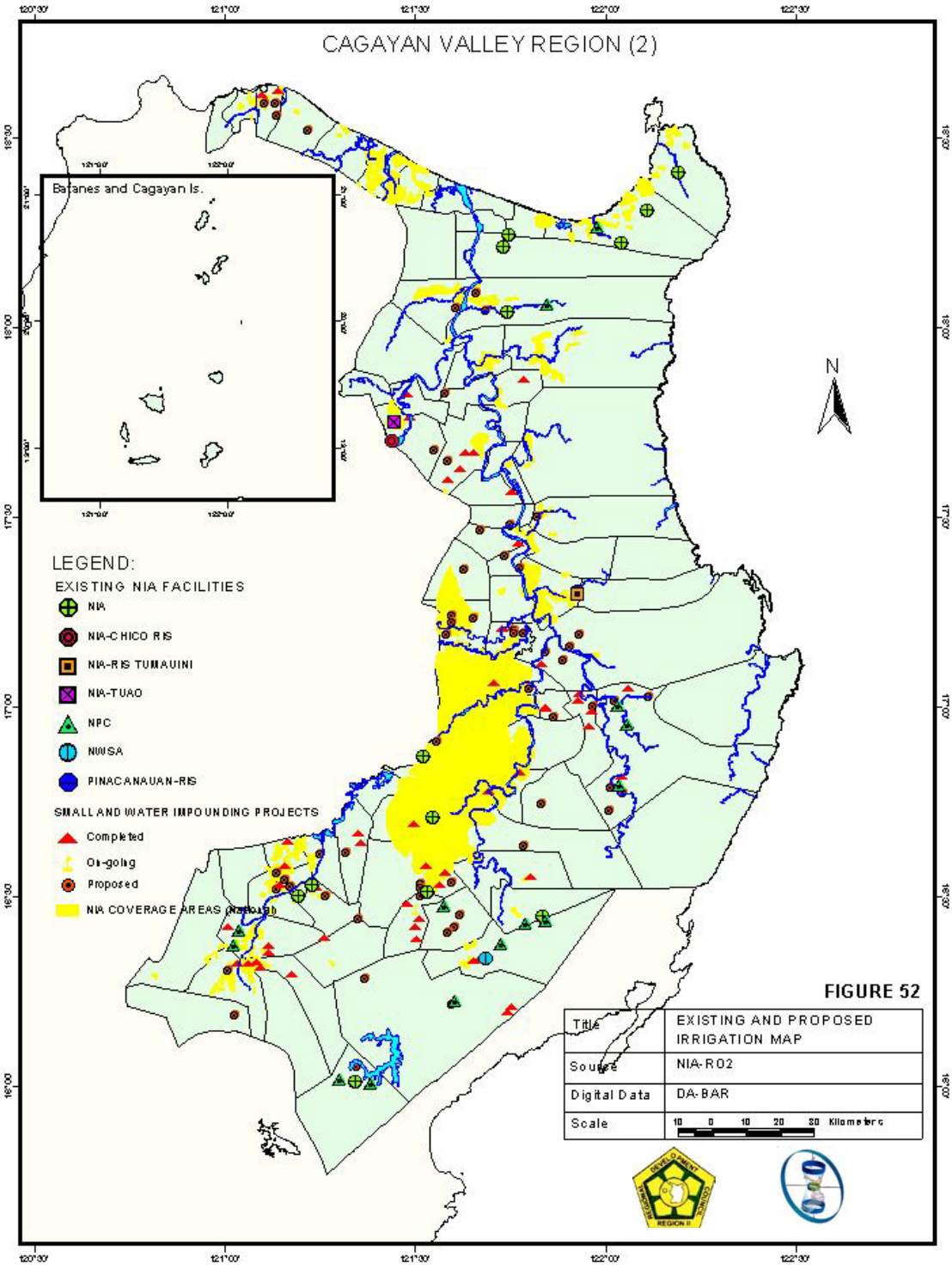


FIGURE 52: EXISTING AND PROPOSED IRRIGATION MAP

CHAPTER 4
PLAN IMPLEMENTATION

A. PLAN IMPLEMENTATION

With the present planning structure, the Regional Physical Framework Plan (RPFP) is guided by the policies of the National Framework for Physical Planning (NFPP) and other pertinent laws relative to land and other physical resources' development and utilization. The document will be the bases and primary reference in the preparation of medium term and sectoral development plans at the regional level. These regional development plans and sectoral/agency plans shall conform to the long-term policies of the RPFP.

Implicit in the existing mode of plan implementation, the Regional Development Council (RDC) and the network of government agencies and local government units and concerned private investors are expected to share the responsibility of implementing the RPFP. The main source of resources and leverage of the government line agencies and local government units in the implementation of their respective development plans lies in the use of public investments (e.g. through the Regional Development Investment Program and Budgeting). The Local Government Units (LGUs) shall be guided by their Comprehensive Land use Plans (CLUPs) and the zoning powers devolved in addition to their Local Development Investment Programs.

The RPFP on the other hand shall give direction to land use planning activities at the local level particularly in the preparation of Provincial Physical Framework Plans (PPFPs) of provinces and Comprehensive Land Use Plans (C/MCLUPs) of cities and municipalities in the region. These documents (PPFPs and CLUPs) should conform to the framework and land use policies of the RPFP. Thus, the Local Development Councils through their Land Use Committees shall be guided by the policies of the RPFP to synchronize planning efforts and plan documents at the regional and provincial levels.

Further, the private sector/investors (land developers and industrial/business investors) have crucial roles to perform in achieving the Plan objectives. However, their decision to invest may depend to a large extent on the region's resource endowment, available manpower and existing infrastructures, and is affected by regional and local development policies and peace and order situations.

1. Review, Approval and Adoption Process

The formulation of the RPFP document went through an iterative process. This was done to ensure the integration of various development policies and aspirations at the national, sub-regional and local levels and to gain support from stakeholders e.g., RLAs, LGUs, the private sector and the civil society. This process ensures the synchronization of development plans at the different levels and affirms their acquired significance and legitimacy. The Cagayan Valley RPFP involved a wide participation of stakeholders in its preparation and underwent a plan review, approval and adoption process. Further to

this, the need for the involvement of concerned agencies, LGUs and the private sector in the formal process of endorsement and adoption of the document was very helpful.

This process aimed primarily to have a deeper involvement of concerned entities and a wider support on the plan's implementation. Copies of the draft plan were circulated to the concerned agencies for their simultaneous review. The comments and recommendations drawn from the review were incorporated to the plan.

The RLUC-Technical Working Group conducted a series of provincial consultations and public hearings through the presentation of the draft RPFP before the Sangguniang Panlalawigan Members, Provincial Land Use Committee members, Municipal Mayors and the private sector of each province. The reactions and suggestions to the plan particularly policies affecting their provinces were solicited to enrich the document. To complement the consultation at the provincial level, an interregional and national consultation was conducted.

An interregional consultation was conducted to ensure the complementation of interregional development specifically in terms of critical resource management i.e., common watershed areas, and economic concerns particularly infrastructure support system. On the other hand, a review by the National Land Use Committee (NLUC) through its secretariat was conducted to ensure the synchronization of the RPFP policies to the National Framework for Physical Planning (NFPP) document.

2. Phasing of the Plan

As a basis in projecting the change in the availability and utilization of the region's resources arising from the anticipated demand for land and other natural resources by socio-economic activities during the different stages of the plan period, the plan is sub-divided into three (3) 10-year phases. In turn, the nature and intensity of production and protection land uses, settlements and infrastructure interventions are clearly indicated according to the projected developments during the three phases of the plan period.

The first 10-year phase (2001- 2010) contains specific sector policies aimed to guide the medium-term development plans and sectoral agency plans at the regional level. Broad but short-term policies on settlements, production land use, protection land use and infrastructure shall provide the direction of medium-term development plans prepared within this phase. On the other hand, these policies shall guide the Provincial Physical Framework Plans (PPFPs) of the region's provinces and are expected to be further detailed at the city and municipal levels in the formulation of their respective Comprehensive Land Use Plans (CLUPs).

The second and third 10-year phase (2011–2020 and 2021-2030 respectively) presents a more generalized policy on the four major components focusing on land utilization and development. Policies and strategies in the last two phases are directional aimed at achieving the long-term (30–year) goals and broad sector objectives of the RPFP.

2.1 FIRST PHASE (2001-2010)

Population and Settlements Sector

The sector will be divided into three 10-year phasing to gradually cover the whole process towards attaining the level of a rationally distributed population in a hazard-free environment for equitable access to social services, economic opportunities and benefits bridging the gap of urban-rural disparities. The phasing shall also ensure the efficient utilization of resources through a strengthened aggrupation of cities and municipalities and closely linked metropolitan areas in the region. Eventually, the region's economy shall be gearing towards complementation with other regions and finally competing in the global market.

The development and bridging of the gap of existing urban centers and rural communities to sustain and support the "Parallel Growth Development Strategy" shall be pursued during the first 10-year period. This will involve the provision of the distinct needs and level of requirements of urban and rural areas in terms of access to social and economic services and facilities.

The agglomeration of cities and municipalities for the development of metropolitan areas shall be pursued within the first 10-year of the plan period. The clustering of strategically contiguous areas will be done for an efficient utilization of resources through effective sharing in the provision and delivery of services. Priority areas for aggrupation shall be the influence area of higher level growth centers i.e., Tuguegarao, Cauayan, Santiago, Ilagan, Solano-Bayombong. Primary considerations in metropolitan arrangement shall be economic complementation, existing and projected infrastructure linkages, social service, and geographic complementation. The provision of inter-municipal network of urban facility and services like potable water system (level III), waste management, road network, communications and health services delivery will be provided. Bulk of the hospital bed to be provided within this period shall be in the province of Isabela where it requires 630 beds out of the 869 projected need of the region by 2010. These health facilities will be located in strategic population centers to significantly improve the access of population to health services. There will be considerable improvement in the provision of water supply (level III) within this period. Metropolitan water arrangement will be the focus of studies to support the agglomeration of cities and municipalities. The Metro Tuguegarao Water System shall initially operate and feasibility studies of other metro areas shall be completed by the end of the first phase. The construction and rehabilitation of rural roads shall be pursued to facilitate access to production areas and improve urban-rural complementation.

For a much improved and hazard-prone free settlement areas, a ground delineation of flood-prone areas, erosion-prone embankment specifically along the Cagayan River and other hazardous areas shall be conducted during this period. Housing within these areas shall be restricted and existing settlements in extremely critical areas will be relocated. Included for ground delineation shall be the socialized and projected housing sites and areas for other urban land use. These information shall be considered in the preparation of zoning ordinances for an efficient management of urban expansion.

Production Land Use

Initially, the region will optimize the use of its croplands, marine areas, production forest areas and mineral lands en route towards augmentation of its resource base in agriculture, fishery, forestry, minerals and indigenous energy. However, within the short term, specific attention shall be accorded to the comparative advantage of the region in agriculture through productivity enhancement, optimal and sustainable use of existing and potential production expansion areas and gradual crop diversification.

The region will work for the attainment of national food sufficiency, through its grains production, while simultaneously endeavors to explore its more potent economic strength on high-value and industrial crops production. Parallel to this operational framework, agri-industry development shall be dispersed to the countryside encouraging household livelihood to gradually develop to micro-cottage industries.

Fishery development shall focus on strengthening the capability of small fisherfolks to participate in more intensive fishery production undertakings initially towards inland and coastal aquaculture. Timber corridors will also be established while effectively divert the concentration of forest-based industries to other sources of livelihood. Tourism will cater mainly to local tourists while gradually exert its way towards gaining niche for priority tourism sites. Support industries to tourism shall also be encouraged and developed. Minerals production will focus mainly in no-land use conflict areas while resolving issues on mineral exploration and extraction.

Protection Land use

The region's guiding framework for the thirty-year period is the maintenance of its vigilance in protecting its remaining forest. Full restriction and strict regulation shall be pursued while enhancing rehabilitation activities on degraded areas within its protection forest and coastal areas.

Within this phase, the region will have to complete the ground delineation between the forest and the A&D areas. Likewise, protected and production forest areas shall have been delineated on the ground. This serves as basis for local physical and development planning and management of protected areas. Correspondingly, intensified efforts in identifying, delineating, and proclaiming environmentally critical areas such as watershed and biodiversity rich areas on land and water shall have been accomplished. Efforts towards restoration and rehabilitation of all degraded watershed areas shall have started and subjected to strict regulation on its use or development. Watershed areas within A&D shall have been fully delineated and assessed as to what activities can be allowed. LGUs shall have strengthened the policy and enforcement framework on the proper management of watershed areas particularly those within the forest area. Intact watershed shall be subjected to full restriction with "no touch and no entry" policy having been fully enforced.

Other degraded areas within the protected forest or coastal areas shall be rehabilitated and restored at least to its most functional condition. Other areas within the protection forest that needs urgent rehabilitation but are inaccessible shall be monitored regularly and left for natural regeneration.

LGUs shall have initially pursued their critical role in the co-management of resources within the protected areas. It shall be an imperative for the LGUs to formulate their localized version of the Environment Code which will also signal the preparation of local management plans and shall be initially implemented during the period. The management shall define clearly the roles and functions of those involved and the areas covered. Likewise, upland and coastal communities shall be capacitated towards forest protection with better alternative source of livelihood other than forest resource extraction.

The Cagayan River particularly its riverbanks shall be protected from any form of economic activity and non-structural erosion measures like tree rows or bamboo rows within the 20 meter easement shall supplement structural measures.

Infrastructure

The phasing of the sector shall be in accordance with the projected need and tempo of the production, protection and settlements components. This is to provide an effective and efficient infrastructure support in the operationalization of the "parallel growth strategy" of the region.

Efforts in the infrastructure sector shall focus on the maintenance of existing transport system and the construction of alternate routes in and out of the region. Feasibility studies of identified major roads shall also be completed. Ports and airports in selected priority areas shall continue to be developed. In support to the urban-rural balanced development, infra support to far-flung communities and access roads linking the production areas and urban centers will be pursued. Much improved access to health and education facilities in rural areas and a significant increase of thirty percent (30%) in the coverage of level III water supply shall be achieved.

Along with the rehabilitation of existing irrigation facilities, expansion of irrigation service areas through construction of new irrigation facilities shall be pursued. Irrigation development shall increase from the present forty-eight (48% as of 2003 to fifty two percent (52%). This translates to an increase from the 225,691 hectares to 245,773 hectares of irrigation development towards the end of the 1st 10-year phase of the plan (This target covers the irrigation facilities of NIA, DA, DAR, and the local government units). The Cagayan River will continue to be harnessed as irrigation source and a further study on its use as an alternative transport medium and tourism facility shall be conducted. Meanwhile, initial operation of the roll-on roll-off facility using the Pacific Coast is expected towards the last quarter of the first phase.

On the other hand, improvement of access roads, electrification and communication will be provided in support to tourism, Small-Medium-Enterprises (SMEs) and minerals development during this period.

2.2 SECOND PHASE (2011-2020)

Population and Settlements

The second phase of the plan will continue to strengthen the complementation of urban and rural communities. Efforts shall be focused on the clustering of remaining

municipalities and strengthening of the complementation of the clustered municipalities during the first phase of the plan period. All cities and municipalities shall have been clustered towards the end of the second phase to complete the agglomeration of LGUs.

In this phase, the establishment of medium to large scale agri-based industries will further boost urban-rural complementation. With production areas providing inputs to industries established in urban centers, the desired complementation shall be achieved.

Hazard-prone areas free from settlers shall be achieved within this period. Efficient and effective management of LGUs on urban and rural areas and their complementation shall have been at a maximum level at the end of the second phase.

Production Land Use

Within this phase, optimizing productivity will remain as the major framework for all production areas. Agricultural areas shall have already achieved significant improvement in spatial development and production shall have exhibited considerable surpluses in grains, rootcrops, fruits, vegetables, livestock and fisheries. With a stronger resource-base, the region shall have the competitive advantage to open its door to more investment in production and processing. Micro and cottage industries will now gradually be developed to small and medium enterprises. Feed mills and other grains processing industries would then be able to function more effectively with sustainable supply.
Food processing shall have already gained domestic and national quality and standard with widened market linkages. The region shall have gained foreign investors confidence and significant investment inflow shall have been realized. Industry generators like fish production and processing shall have also been developed for aquaculture and aquacapture, which will rely on mariculture, sea ranching and off-shore commercial operation. Similarly, forestry-based industries shall be pursued and revived upon full maturity of timber resources from industrial tree plantations or timber corridors. The mineral potential of the region shall have been fully assessed and explored to determine the most sustainable approach in the extraction of this potential.

Protection Land Use

At the commencement of the phase, considerable areas of watershed shall have been rehabilitated though continuing rehabilitation of remaining degraded watersheds and other degraded areas within the protected forest shall remain the primary focus. All LGUs shall have integrated management plans and action agenda that will direct communities and LGUs towards protecting the initial gains achieved during the first phase and shall proceed towards advancing towards full autonomy in managing resources within the protected areas of the region. Full enforcement of laws and policies relevant to environmental protection is also expected with all the stakeholders having been fully strengthened, capacitated, and pertinent systems in place.

d) Infrastructure

The second phase of the plan shall highlight the infrastructure support to the establishment of medium to large-scale agriculture-industries, tourism and minerals development. Transport system shall improve a lot particularly in the interregional complementation of roads, sea and air transport system. Lateral roads connecting

Region 02 to Regions 1, 3, 4 and CAR shall be constructed. The development of the following interregional roads shall be pursued:

Cagayan-Apayao-Ilocos Norte Road
Abulug-Luna-Pudtol-Kabugao Road
Ramon-Potia Road
Baguio-Aritao Road (Pangawan-Kayapa-Aritao Section)
Claveria-Calanasan Road
Piat-Tuao-Kabugao Road
Ilocos Sur-Abra-Kalinga-Apayao-Cagayan Road (Regions 01, CAR, & 02)
Manila-North Road (Laoag-Alllacapan Section, Regions 02 & 01)
Sta Fe. –San Nicolas –San Jose Road
Quirino-Aurora Road
Dalton Pass East Alternate Road (Nueva Ecija- Nueva Vizcaya Section)

In support to the production and establishment of large agriculture-industries, irrigation expansion shall take a big leap during the period. Twenty percent (20%) of the remaining potential irrigation service area shall have been covered in the second phase. Irrigation facilities will be maintained and farm-to-market roads, post harvest facilities and flood control shall be provided. The Cagayan River shall be further developed and tapped to support the significant increase in irrigation coverage.

2.3 THIRD PHASE (2021-2030)

a) Population and Settlements

Towards the end of the plan period, the region's population shall have equitable access to social services and economic opportunities. Households within urban centers shall have access to level III water system equipped with modern water treatment facilities. Efficient drainage and waste disposal systems in metro areas and other urban centers should have been in place within this period.

During this phase, metro areas will be further strengthened. The linkages of the established network of agri-industries in the different growth centers in the region shall be enhanced to strengthen the complementation of the different metropolitan areas. Interregional complementation of higher level services (e.g., education and health) and industries (agri-based) shall have been established.

The whole system of production, processing and settlements distribution in the region shall have been fully integrated. And the smooth flow of services and commodities within urban and rural areas shall have been achieved.

b) Production Land Use

The region's paradigm would then be towards full industrialization within this last phase. Farming systems shall have been fully modernized, self-sustaining and adopting environment-friendly approaches. Small and medium enterprises shall have gained momentum and intensified to large-scale commercial operation. These industries, as the engine of growth, will transform the region to a fully functional system of agglomerated and competitive industries supportive to the regional economic mainstream

complementing a balanced rural and urban development. While working for intensification of its economic proficiency and competency, the region shall have ultimately and confidently opened its door to a borderless economic cooperation.

Protection Land Use

The region shall have achieved total harmony with its environment with the LGUs gaining full autonomy in managing the forest and the local population more conscious and vigilant of their indispensable role in environmental protection. The region shall have once again reclaimed its role as haven to the wide array of endemic species of flora and fauna. All watersheds shall have recovered as manifested by close canopy forests, more vibrant rivers restored to their most stable state that shall provide safe and sufficient water requirements.

Infrastructure

The end goal of the infrastructure sector within the plan period is for an efficient and effective inter and intra transport system in support to the established agriculture industries in selected growth centers; and reliable access to production areas for a balanced or parallel development of the region.

An extension of the North Railway System to connect the CSEZFP in Sta. Ana, Cagayan is expected for completion during the period. Access by the network of agriculture-industries to the railway shall be ensured for a much improved commodity transport system. The Cagayan River shall now be fully developed for irrigation, fishery, tourism and alternative transport.
In support to the industrialization of the region, social service facilities and utilities shall have been upgraded. The Sta. Ana Port shall have been fully operational catering to international cargo vessels/sea-lane augmenting the Currimao Port in Region I. An international airport shall have been established to support the region's economic linkages with the rest of the country and internationally. The province of Batanes shall have been fully established economically with its All Weather Ship-Shelter Port in the municipality of Basco in full operation.

In this period, Region 2 shall have fully developed its potential energy sources. Cagayan Valley shall have been among the major energy producers in the country. The region's main centers shall have been enjoying modern communication facilities and services; and the region's hinterland population shall have access to efficient communication network.

3. Integration of Plans and Planning Processes

Based on the nature of the RPFP as having been legitimized through the approval and endorsement of the region's local government units and the RDC, it is expected that the document shall provide the integrative framework towards which subsequent regional and local socio-economic development planning activities shall be geared.

3.1 Vertical Integration

The development plans and the projects especially those that have spatial and locational dimension, involve the use of specific parcels of land uniquely located within

cities or municipalities. It is necessary for such plans and projects conceived at higher levels to be consistent with the plans at the local areas where the land is situated. The converse is equally important and necessary ***(Figure 53)***.

As the RPFP will go through an iterative process in its preparation, it is anticipated that policies of the four major plan components (Protection Land Use, Production Land Use, Settlements Component and Infrastructure Component) are within the broad policies of the National Framework for Physical Planning (NFPP). The RPFP being essentially a general framework, is expected to be replicated in greater detail at the local levels e.g. provinces, cities and municipalities.

The provincial framework plans (PPFPs) will be the intermediate link between the regional/national framework plan and the city and municipal plans. The PPFPs will guide the preparation of C/MCLUPs particularly in reconciling land use proposals of adjacent cities or municipalities within a province. The province is considered a crucial component of the physical planning system since the PPFPs serve as the integrating framework for the local land use plans and the corresponding zoning ordinances to be enacted and enforced by the Local Government Units (LGUs). This entails the dual characteristics of the PPFP, first as a more detailed disaggregation of the relevant portion of the RPFP and second as an abstraction of the city and municipal land use plans. Hence the synchronization of the RPFP with lower level plans will be ensured with the translation and detailing of the broad policies of the RPFP in the preparation of PPFPs, CCLUPs and MCLUPs.

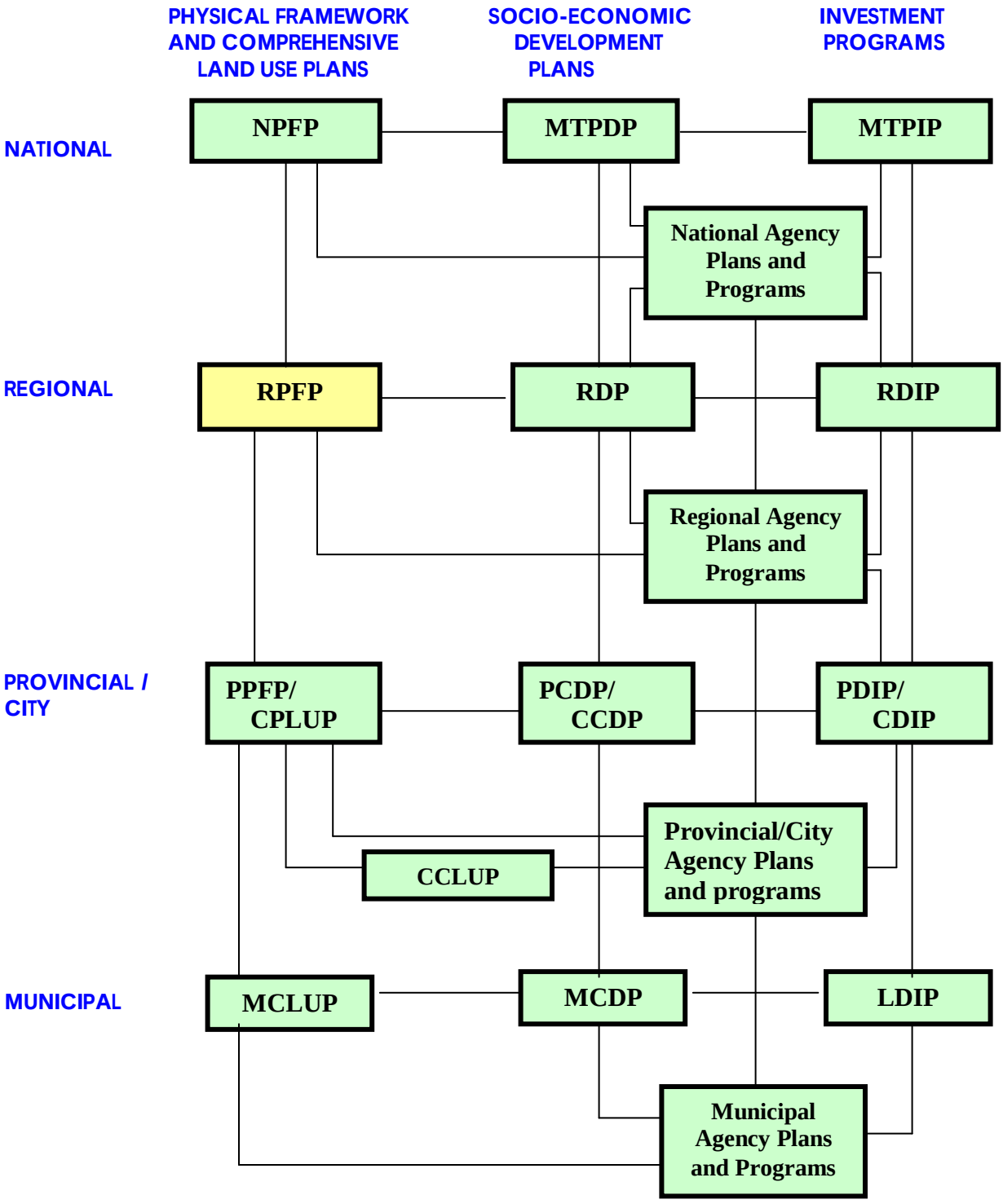
Having the PPFP in place and with the mandate of the Provincial Land Use Committees (PLUCs) to review and approve the Comprehensive Land Use Plans (CLUPs) of Component Cities and Municipalities, it is expected that these documents further align and detail the policies of the RPFP. Ultimately, given the statutory power of LCEs at the city and municipal levels, the implementation of the C/MCLUPs through their zoning ordinances will be realized.

The above planning system does not only enhance the vertical integration of plans but also the geographical complementation of neighboring administrative areas. The discrete and independent plan preparation of cities and municipalities where no consideration was given to adjoining administrative areas that later resulted to incompatible land use proposals will be resolved. This will also address the issues entailed in the traditional system in local plan preparation, review and approval particularly in the complementation of proposed resource utilization of adjoining areas. The high degree of conflict and incompatibility brought by the lack of supra coordinative efforts at the provincial level is expected to be minimized.

3.2 Horizontal Integration

While it is absolutely necessary for framework plans to be integrated vertically, it is less necessary for medium-term and short term plans to be vertically integrated. This is to give substance to the principle of local autonomy. However the horizontal integration of medium and short-term plans and investment programs with their respective physical framework plans is a must. Inasmuch as short and medium-term development plans are coterminous with elected officials and are likely to change with them, the continuity and stability of these plans are at stake. The function for the need to provide a measure of

FUGURE 53. HEIRARCHY OF PLANS AND PLANNING LINKAGES



stability and continuity to otherwise disjointed political program is performed by the long-term physical framework plans.

The spatial and physical dimension of medium-term plans will be enhanced as the RPFP shall be the main reference in the preparation of the Regional Development Plan (RDP). The objectives, strategies and targets of the RDP will be consistent and should contribute to the attainment of the long-term development goals and strategies of the RPFP. Land and other physical resources defined by the social, economic and infrastructure sectors' target shall directly be consistent and be within the long-term policies of the physical plan. Sector/agency plans specifically agencies mandated in the management, exploitation, utilization and development of land and other physical resources shall also be consistent with the framework plan.

The policies covering the four (4) major components (Production Land Use, Protection Land Use, Settlements Component and Infrastructure Component) of the RPFP will serve as the framework for the formulation of medium-term programs and projects. The land use components (production and protection) shall have strong influence on the regional development investment program (RDIP). The RDIP will finally be broken down into the annual investment budgets of the line agencies. The objectives, strategies and targets of the RDP should therefore be tested and evaluated as to their consistency with, and contribution to the attainment of the long term development goals and strategies.
Sectoral agencies having to do with land and other natural resources may formulate and adopt their own long-term and medium term plans. Such sectoral plans must be placed within the framework of the RPFP. The sectoral agencies concerned are linked to the RPFP process in at least two ways. The first contribution of the sectoral agencies is in the form of sectoral data and information as input to the formulation or reformulation of regional development goals and strategies in the RPFP. The second role of the sectoral agencies in the RPFP process is that of implementing the particular components of the RPFP that are within their functional responsibility through their sectoral programs and projects. The latter role include among others, monitoring of environmental change to furnish feedback information into an interagency resource information system. This resource information system provides data for future revisions of the RPFP and the formulation of other development plans.

Land use regulation in privately owned lands shall continue to be exercised by city and municipal government. Indirectly through its power of automatic review of Municipal Comprehensive Land Use Plans (CLUPs) and other municipal legislations, the provincial government can also exercise control over municipal land use planning.

4. Mechanism for Land Use and Physical Planning and Coordination

The preparation and subsequent review, refinement or revision of the RPFP primarily rests with the Regional Development Council through its Regional Land Use Committee and its corresponding committees at the provincial and municipal levels.

At the regional level, the Regional Land Use Committee (RLUC), which is accorded the status of a standing committee of the Regional Development Council, shall continue to coordinate the activities related to land use and physical planning for the region. At present, the RLUC is composed of the heads of the regional line agencies concerned with land and natural resources utilization, with representatives from local government units and the private sector, particularly from private organizations directly concerned

with the major aspects of the region's land and natural resources utilization. It is headed by the Regional Director of the NEDA as the chairman and supported by a Secretariat group composed of NRO Inter-Division Technical Staff and representatives of the member agencies.

The same structure is replicated within the Provincial Development Councils and is encouraged to be organized at the municipal level. The Provincial Land Use Committee (PLUC) is headed by the Provincial Planning and Development Coordinator (PPDC) with the same agencies presented at the regional level as members. The technical arm of the PLUC will be the senior staff of the member agencies with the Provincial Planning and Development Office (PPDO) as the secretariat.

B. MONITORING AND EVALUATION

A monitoring system shall be established to provide a feedback mechanism in the utilization and development of physical resources in the region. Concerned agencies shall be encouraged to closely monitor the implementation of land use related policies and establish a land use information system. The most effective level at which environmental change monitoring can be undertaken is at the provincial level. Here, the PLUC/PPDO can team-up with the PENRO and/or CENROs to monitor environmental changes that take place in lands of public domain and the provincial, city and municipal assessors to monitor changes in A&D lands. The academe, NGOs and POs may also be called upon to assist in this process. Project monitoring and evaluation will continue to be joint responsibility of the responsible implementing agency and the PPDO, CPDO, MPDO and the private sector.

Provinces should devise a system to monitor and establish a data bank and updated information in land and other physical resource utilization. The provinces through the Provincial Land Use Committee (PLUC) shall be responsible for coordinating, monitoring and aggregating data from cities and municipalities and to include local NGO initiatives.

Monitoring and evaluation systems should be designed and operated to:

Improve performance of programs, projects, or activities by:

- Providing timely information to management and implementing units on operation and performance, primarily in terms of inputs and outputs, and particularly whether the targets are met within the prescribed period of time and within the resources allocated for it.

- Generating socio-economic information required for effective implementation.

- Identifying and analyzing problems arising during implementation and suggesting possible solutions thereat.

Evaluate results and improve future planning processes by:

- Measuring effects and impacts.
- Identifying and analyzing factors affecting performance, in terms of both enhancing or deterring the implementation of programs, projects, or activities.

- Evaluating concepts, assumptions, and models in the light of actual performance and prevailing conditions.

Monitoring and evaluation may be built in so that the plan updating process will be facilitated. The following systems will be developed:

1. Environmental Monitoring System

The environmental monitoring system will be adopted to provide current and concise eco-profiles of watersheds, and public domain lands within those watersheds, providing a feedback mechanism for regional resource managers to evaluate the impact of land classification policies, spatial plans, and subsequent public and private sector activity. River water analysis and hillside erosion will form key parts of the system. In addition, the system will measure parameters tailored to the monitoring of specific environmentally critical sub-classified areas. The process would be a network parameters and locations that will be established, and regular measurements made. Old and current remote sensing imagery will be analyzed. All the data collected as a result of environmental monitoring will be stored and integrated in a Geographic Information System (GIS).

2. Natural Resource Management Information System (NRMIS)

An integrated resource inventory system aimed to establish an updated data bank on natural resource information will be pursued. This will be operationalized through the Regional GIS Network which was established to have up-to-date and accurate digitized geographic data in the region. This will also serve as the core of a regional network of government and non-government offices for the spatial database for Region 02.

Specifically the Regional Geographic Information Network (RGIN) aims to:

Establish a Standard Base Map to guide all mapping activities in Region 02.
Standardize the regional GIS Information to facilitate varied applications of GIS and the exchange among different users;
Assist line agencies, LGUs and NGOs with an accurate and up-to-date information for planning, evaluation and monitoring purposes; and
Promote the utilization and application of GIS technology in planning, programming and project monitoring and evaluation.

The RGIN of the Regional Development Council connects with Provincial GIS Centers as satellites for data build up and data sharing. A Memorandum of Agreement (MOA) formalizes the institutionalization of the RGIS Network with the provincial and agency centers.

Data build-up and generation in the Center is a concerted effort between and among concerned RLAs, LGUs, NGOs, POs, and other institutions. The data in the GIS Center will be accessible to all Regional Line Agencies, Local Government Units and Non-Government Organizations for their use in development planning, programming, project evaluation and monitoring activities.

The setting up of a Natural Resource Information System through the RGIN will eventually contribute to a timely, accurate and effective data for use in updating of Land Use Plans.

It is deemed important to evaluate and see the extent of policy implementation and determine the plan's achievement in what was intended in terms of scale and pattern of development.

PLAN REVIEW AND UPDATING

A mid-plan review and assessment will be undertaken in every 5 years of the Plan period. The broad goals and sector objectives will be assessed against the monitoring feedback/reports. This allows identification of those areas where planning has been particularly successful or unsuccessful in achieving what was intended, both in terms of general goals and objectives.

Amendments to the plan resulting from monitoring and evaluation will be done with appropriate RDC approval/resolution. If necessary and in case of major changes in policy direction and development thrusts and priorities in the different major plan components, any plan revision or updating will be undertaken following the same plan preparation process.

D. IMPLEMENTATION SUPPORT ACTIVITIES

1. Public Information Program

The success in the attainment of the overall goals and objectives of the RPFP which envisions a much improved quality of life for the regional populace to make them more effective and efficient partners in the development of the region, is hinged on the degree of awareness and understanding of the populace to its mandate. Physical planning advocacy therefore shall be promoted to harness a wider RPFP implementation support and cooperation from the concerned RLAs, LGUs and the private sector.

Since physical plans and planning processes is relatively a new concept, support and cooperation of public and private entities will not be readily forthcoming. Hence, there shall be a massive and sustained information program that will communicate and disseminate the RPFP's long term vision and goal of development particularly the policies, programs and projects that will be carried out within the plan period.
A continuing advocacy through seminars, fora, conferences and briefings for regional and local leader, their technical staffs and the general public shall be conducted. The reproduction and distribution of the RPFP document and related physical planning print materials shall also be done.

Identified to be one of the most crucial step to the success of the plan's implementation is the support of the local government units and the government agencies. There shall be proper networking of concerned agencies and local government units to fully institutionalize the linkages of plans and planning processes at all levels specifically at the provincial levels. The establishment of a strong and harmonious inter-departmental and inter-agency cooperation at each level to ensure smooth and effective RPFP implementation is most sought.

2. Capability Building Program

With regional physical framework planning being relatively a new dimension in development planning horizon, there is a general lack of technical manpower with the skills for the preparation of good physical plans. As part of the continuing process of refining the RPFP to suit changing conditions and to keep abreast of recent developments in physical planning concepts and techniques, the development of the regional technical staff through trainings and workshops is deemed important.

Efforts have to be made for the regional technical manpower, particularly representatives to the RLUC-Technical Working Group, to tap training opportunities both local and foreign. The suggested fields of training identified to be necessary for the region are: a) Environmental Monitoring; b) Resource Base Data Generation; c) Environmental Impact Assessment; d) Urban Planning, and e) Geographic Information System (GIS) Operation and related GIS capability building trainings.

On the other hand, the issue on gender sensitivity and gender responsive planning shall also be addressed. While it is widely acknowledged that women have important roles in development, it is not so in the levels of policy making and program planning. Policy decisions made have been gender blind if not biased. Consequently the role of women in all aspect of development remained marginalized. Hence, in the operationalization of the RPFP, particularly the formulation of medium term, sectoral and agency plans, the specific role of women shall be specified to address the issue.

Further, the conduct of trainings on gender sensitivity and the establishment of Women In Development (WID) focal points at regional and local levels as mandated in RA 7192 shall be pursued.

3. Continuing consultation on Land Use Issues

For a better understanding of the specific policies identified in the Plan, the RLUC, in coordination with concerned agencies, local government units and experts shall within and outside of the region shall conduct fora on mining, forestry, fishery and other related concerns.

4. Further Research Planning and Development

Although the RLUC-TWG has comprehensively undertaken input studies and analysis relative to the preparation of the Regional Physical Framework Plan (RPFP), a number of important areas of concern has not been adequately studied during the Plan preparation process due to reasons which includes among others: the inadequacy of data; the unavailability of analytical systems and methodologies and the material time needed to pursue such studies.

Among the more important concerns recommended for further study are:

Detailed study and planning of the Cagayan Riverine Zone with its multiple uses.

Study on migration levels and trends particularly from rural to urban areas, rural to upland areas and inter municipal/provincial population movement;

Study on the short and long term effect of land use conversion specifically of agricultural lands to urban uses and forest lands to agricultural production areas;

Review and analysis of national policies related to forestry and logging.

Further study of identified eco-tourism sites specifically in critical protected areas to improve environmental protection and management.

Detailed studies to improve environmental management such as the extent of siltation and bank erosion.

A Transport Cum Tourism study on the Cagayan River. This study shall include the determination of the most suitable structure to manage the Cagayan Riverine given its intersectoral utility.

Further study on the different sub-basins of the Cagayan River.

Commodity studies with the objective to identify the relative comparable advantage of Region II in specific field and industrial crops.

Study on the existing planning structure and planning guidelines focusing on the synchronization of plans and planning processes at the different levels. Improvement on the effectivity of local plans, specially city and municipal land use plans should also be looked into.

Improvement of the current methodology of estimating the poverty incidence, its spatial distribution and a more detailed analysis of the lower segment of the income class distribution;

A review of the functions and operational linkages of the different administrative bodies concerned with physical planning such as the Local Planning Program (LPP-Regional Operations Group (ROG)) and the Regional Land Use Committee (RLUC).

Agrarian Reform – the redistribution of lands, regardless of crops or fruits produced, to farmers and regular farmworkers who are landless, irrespective of tenurial arrangement, to include the totality of factors and support services designed to lift the economic status of the beneficiaries and all other arrangements alternative to the physical redistribution of lands, such as production or profit-sharing, labor administration, and the distribution of shares of stocks, which will allow beneficiaries to receive a just share of the fruits of the lands they work.

Agrarian Reform Community - is a barangay at the minimum or a cluster of contiguous barangays where there is a critical mass of farmers or farm workers and which features the main thrust of agrarian development: land tenure improvement and effective delivery of support services.

Agricultural Land – land devoted to, or suitable for, cultivation of the soil, planting of crops, rowing of trees, raising of livestock, poultry, fish or aquaculture production, including the harvesting of such farm products, and other farm activities and practices by persons whether natural or juridical and not classified by law as mineral land, forest land, residential land, commercial land, or industrial land (RA 8850).

Agricultural Mechanization - is the development, adoption, manufacture and application of appropriate location-specific, and cost-effective agricultural technology using human, animal, mechanical, electrical and other non-conventional sources of energy for agricultural production and post-harvest operations consistent with agronomic conditions and for efficient and economic farm management.

Agriculture and Fisheries Modernization - is the process of transforming the agriculture and fisheries sectors into one that is dynamic, technologically advanced and competitive yet centered on human development, guided by the sound practices of sustainability and the principles of social justice.

Agro-Processing Activities - refers to the processing of raw agricultural and fishery products into semi-processed or finished products which include materials for the manufacture of food and/or non-food products, pharmaceuticals and other industrial products.

Alienable and disposable lands – lands of the public domain subject to the present system of classification and declared as not needed for forest purposes (PD 705); lands of the public domain which have been delineated, classified and certified as such and available for disposition under the Public Land Act.

Ancestral Domains - refer to all areas generally belonging to ICCs/IPs comprising lands,inland waters, coastal areas, and natural resources therein, held under a claim of ownership, occupied or possessed by ICCs/IPs, themselves or through their ancestors, communally or individually since time immemorial, continuously to the present except when interrupted by war, force majeure or displacement by force, deceit, stealth or as a consequence of government projects or any other voluntary dealings entered into by government and private individuals, corporations, and which are necessary to ensure their economic, social and cultural welfare.

Ancestral Lands - refers to land occupied, possessed and utilized by individuals, families and clans who are members of the ICCs/IPs since time immemorial, by themselves or through their predecessors-in-interest, under claims of individual or traditional group ownership,continuously, to the present except when interrupted by war, force majeure or displacement by force, deceit, stealth, or as a consequence of government projects and other voluntary dealings entered into by government and private individuals/corporations, including, but not limited to, residential lots, rice terraces or paddies, private forests, swidden farms and tree lots.

Aquaculture - fishery operations involving all forms of raising and culturing fish and other fishery species in fresh, brackish and marine water areas.

Aquatic Resources - includes fish, all other aquatic flora and fauna and other living resources of the aquatic environment including, but not limited to, salt and corals.

Buffer zones - are identified areas outside the boundaries of and immediately adjacent to designated protected areas pursuant to Section 8 that need special development control in order to avoid or minimize harm to the protected area.

Carrying capacity - refers to the capacity of natural and human environments to accommodate and absorb change without experiencing conditions of instability and attendant degradation.

Coastal Area/Zone - is a band of dry land and adjacent ocean space (water and submerged land) in which terrestrial processes and uses directly affect oceanic processes and uses, and vice versa; its geographic extent may include areas within a landmark limit of one (1) kilometer from the shoreline at high tide to include mangrove swamps, brackish water ponds, nipa swamps, estuarine rivers, sandy beaches and other areas within a seaward limit of 200 meters isobath to include coral reefs, algal flats, seagrass beds and other soft-bottom areas.

Conversion – change in the use of land from agricultural to non-agricultural use as authorized exclusively by DAR.

Cooperatives - refers to duly registered associations of persons with a common bond of interest who have voluntarily joined together to achieve a lawful common social and economic end, making equitable contributions to the capital required and accepting a fair share of the risks and benefits of the undertaking in accordance with universally accepted cooperative principles.

Coral Reef - a natural aggregation of coral skeleton, with or without living coral polyps, occurring in interlidal and subtidal marine waters.

Ecological profile or eco-profile - refers to geographic-based instruments for planners and decision-makers which presents an evaluation of the environmental quality and carrying capacity of an area.

Ecological solid waste management - the systematic administration of activities which provide for segregation at source, segregated transportation, storage, transfer, processing, treatment,

and disposal of solid waste and all other waste management activities which do not harm the environment;

Economies of Scale - refers to the decrease in unit cost as more units are produced due to the spreading out of fixed costs over a greater number of units produced.

Employed persons – includes all those who, during the reference week, are 15 years old and over as their last birthday and were reported as either:

a. at work – those who do any work even for an hour during the reference period for pay or profit, or work without pay on the farm or business enterprise operated by a member of the same household related by blood, marriage or adoption, or

b. with a job but not at work – those who have job or business but are not at work because of temporary illness/injury, vacation or other reasons. Also included are persons who are supposed to start the operation of a farm or business enterprise within 2 weeks from the date of interview.

Employment rate – proportion of the total number of employed persons to the total number of persons in the labor force.

Empowerment - involves providing authority, responsibility and information to people directly engaged in agriculture and fishery production, primarily at the level of the farmers, fisherfolk and those engaged in food and non-food production and processing, in order to give them wider choices and enable them to take advantage of the benefits of the agriculture and fishery industries.

Endangered, Rare and/or Threatened Species - aquatic plants, animals, including some varieties of corals and sea shells in danger of extinction as provided for in existing fishery laws, rules and regulations or in the Protected Areas and Wildlife Bureau of the Department of Environment and Natural Resources (DENR) and in the Convention of the International Trade of Endangered Species of Flora and Fauna (CITES).

Enrolment Rate – the total enrolment in a given level of education as a percentage of the population which according to national regulation should be enrolled in this level.

Environmental compliance certificate (ECC) - is the document issued by the government agency concerned certifying that the project under consideration will not bring about an unacceptable-environmental impact and that the proponent has complied with the requirements of the environmental impact statement system.

Environmental impact statement (EIS) " is the document which aims to identify, predict, interpret, and communicate information regarding changes in environmental quality associated with a proposed project and which examines the range of alternatives for the objectives of the proposal and their impact on the environment.

Exclusive Economic Zone (EEZ) - an area beyond and adjacent to the territorial sea which shall not extend beyond 200 nautical miles from the baselines as defined under existing laws.

Exploration - means the searching or prospecting for mineral resources by geological, geochemical or geophysical surveys, remote sensing, test pitting, trenching, drilling, shaft sinking, tunneling or any other means for the purpose of determining the existence, extent, quantity and quality thereof and the feasibility of mining them for profit.

Extension Services - refers to the provision of training, information, and support services by the government and non-government organizations to the agriculture and fisheries sectors to improve the technical, business and social capabilities of farmers and fisherfolk.

Farm-to-Market Roads - refers to roads linking the agriculture and fisheries production sites, coastal landing points and post-harvest facilities to the market and arterial roads and highways.

Fisherfolk - people directly or personally and physically engaged in taking and/or culturing and processing fishery and/or aquatic resources.

Fisheries - refers to all systems or networks of interrelated activities which include the production, growing, harvesting, processing, marketing, developing, conserving, and managing of all aquatic resources and fisheries areas.

Fisheries Sector - is the sector engaged in the production, growing, harvesting, processing, marketing, developing, conserving, and managing of aquatic resources and fisheries areas.

Fishing (commercial) – the taking off fishery species by passive or active gear for trade, business or profit beyond subsistence or sport fishing.

Fishing (municipal) – fishing within the municipal waters using fishing vessels of three gross tons or less, or fishing not requiring the use of fishing vessels.

Fishing Grounds - refers to areas in any body of water where fish and other aquatic resources congregate and become target of capture.

Food Security - refers to the policy objective, plan and strategy of meeting the food requirements of the present and future generations of Filipinos in substantial quantity, ensuring the availability and affordability of food to all, either through local production or importation, or both, based on the country's existing and potential resource endowment and related production advantages, and consistent with the overall national development objectives and policies.

Food Sufficiency – refers to an area's (region, province, municipality) ability to meet the food requirements through intensive food production in a sustainable manner based on existing and potential resource endowment and related production advantages.

Global Competitiveness - refers to the ability to compete in terms of price, quality and volume of agriculture and fishery products relative to those of other countries.

Gross Domestic Product – measures the additional value of goods and services newly created in the economy. It is measured net; i.e. it is equal to the value of goods and services produced in the economy less the value of all goods and services in the production process.

Hospital – a health institution that provides short-term medical care consisting of observational, diagnostic, therapeutic and rehabilitative services for persons suffering or suspected to be suffering from disease or injury.

Household – an aggregate of persons, generally but not necessarily bound by ties of kinship who live together under the same roof and eat together or share a common the same household food.

Housing Unit – a structurally separate and independent place of abode by which, by the way it has been constructed, converted or arranged is intended for habitation by one household.

Idle or Abandoned Land - refers to any agricultural land not cultivated, tilled or developed to produce any crop nor devoted to any specific economic purpose continuously for a period of three (3) years immediately prior to the receipt of notice of acquisition by the government as provided under RA 6657. This does not include land that has become permanently or regularly devoted to non-agricultural purposes. It does not include land which has become unproductive by reason of force majeure or any other fortuitous event, provided that prior to such event, such land was previously used for agricultural or other economic purpose.

Indigenous cultural community - means a group or tribe of indigenous Filipinos who have continuously lived as communities on communally-bounded and defined land since time immemorial and have succeeded in preserving, maintaining, and sharing common bonds of languages, customs, traditions, and other distinctive cultural traits, and as may be defined and delineated by law.

Infrastructure – any structure necessary to support urban development normally provided by government or public utility companies, e.g. roads, water supply, drainage.

Irrigable Lands - refers to lands which display marked characteristics justifying the operation of an irrigation system.

Irrigated land – land serviced by natural irrigation or man-made irrigation facilities. These include lands where water is not readily available as existing irrigation facilities need rehabilitation or upgrading where irrigation water is not available year-round (RA 8435).

Labor Force – population 15 years old and over who contribute to the production of goods and services in the country. It includes those who are either employed or unemployed.

Labor Force Participation Rate – proportion of the total number of persons in the labor force to the total population 15 years old and over.

Land Use - refers to the manner of utilizing the land, including its allocation, development and management.

Land Use Plan - refers to a document embodying a set of policies accompanied by maps and similar illustrations which represent the community-desired pattern of population distribution and a proposal for the future allocation of land to the various land-using activities, in accordance with the social and economic objectives of the people. It identifies the

location, character and extent of the area's land resources to be used for different purposes and includes the process and the criteria employed in the determination of the land use.

Land Use Planning - refers to the act of defining the allocation, utilization, development and management of all lands within a given territory or jurisdiction according to the inherent qualities of the land itself and supportive of sustainable economic, demographic, socio-cultural and environmental objectives as an aid to decision-making and legislation.

Livestock – farm animals (i.e. cattle, carabao, swine and goat) kept or raised for consumption, work or leisure. In general, poultry is considered a distinct group of farm animals. (NSCB TWG on Livestock and Poultry Production, Sept. 1998)

Mangroves - a community of intertidal plants including all species of trees shrubs, vines and herbs found on coasts swamps or border of swamps.

Minerals – all naturally occurring inorganic substance in solid, gas, liquid, or any intermediate state excluding energy materials such as coal, petroleum, natural gas, radioactive materials, and geothermal energy.

Mineral exploration – the systematic searching or prospecting for mineral resources including energy resources (DENR-MGB).

Mineral land – any area where mineral resources including energy resources are found (RA 7942).

Mineral processing - means the milling, beneficiation or upgrading of ores or minerals and rocks or by similar means to convert the same into marketable products.

Mining area - means a portion of the contract area identified by the contractor for purposes of development, mining, utilization, and sites for support facilities or in the immediate vicinity of the mining operations.

Mining operation - means mining activities involving exploration, feasibility development, utilization, and processing.

Network of Protected Areas for Agricultural and Agro-industrial Development (NPAAAD) - refers to agricultural areas identified by the Department of Agriculture through the Bureau of Soils and Water Management (BSWM) in coordination with the National Mapping and Resource Information Authority (NAMRIA) in order to ensure the efficient utilization of land for agriculture and agro-industrial development and promote sustainable growth.

National Integrated Protected Areas System (NIPAS) - is the classification and administration of all designated protected areas to maintain essential ecological processes and life-support systems, to preserve genetic diversity, to ensure sustainable use of resources found therein, and to maintain their natural conditions to the greatest extent possible.

Non-governmental organization (NGO) - includes nonstock, nonprofit organizations involved in activities dealing with resource and environmental conservation, management and protection.

Offshore - means the water, sea bottom, and subsurface from the shore or coastline reckoned from the mean low tide level up to the two hundred nautical miles (200 n.m.) exclusive economic zone including the archipelagic sea and contiguous zone.

Onshore - means the landward side from the mean tide elevation, including submerged lands in lakes, rivers and creeks.

Ore - means a naturally occurring substance or material from which a mineral or element can be mined and/or processed for profit.

Population – total number of individuals in a territory or locality living at a specific period of time with an agreed definition of residence.

Population Density – number of persons per unit of land area (square kilometers or square miles).

Population growth rate – rate of increase of population either geometrically or exponentially, depending whether time is regarded as discrete or continuous. Normally given as an annual rate.

Port – a shelter harbor where marine terminal facilities are provided, consisting of piers or wharves where ships berth/dock while loading or unloading cargo, transit sheds and other storage areas where ships may discharge incoming cargo, and warehouses where goods may be stored for longer periods while awaiting distribution or loading.

Post-Harvest Facilities - includes, but is not limited to, threshers, moisture meters, dryers, weighing scales, milling equipment, fish ports, fish landings, ice plants and cold storage facilities, processing plants, warehouses, buying stations, market infrastructure and transportation facilities.

Private land - refers to any land belonging to any private person which includes alienable and disposable land being claimed by a holder, claimant, or occupant who has already acquired a vested right thereto under the law, although the corresponding certificate or evidence of title or patent has not been actually issued.

Protected Areas – identified portion of land and water set aside by reason of their unique physical and biological diversity and protected against human exploitation .

Protected landscapes/seascapes - are areas of national significance which are characterized by the harmonious interaction of man and land while providing opportunities for public enjoyment through recreation and tourism within the normal lifestyle and economic activity of these areas.

Public land - refers to lands of the public domain which have been classified as agricultural lands and subject to management and disposition or concession under existing laws.

Public Sector – consists of the National Government, local government, government-owned and controlled corporations and government monetary institutions.

Quarrying - means the process of extracting, removing and disposing quarry resources found on or underneath the surface of private or public land.

Reclassification – is a general authority of the LGU to change the classification of a zoned area to another zone classification e.g., from Agricultural to Residential, from Residential to Commercial .

Road, national – road forming part of the main trunkline system that is continuous in extent. It includes roads leading to national ports, airports and park. City roads and streets from the secondary trunkline system.

Rural – refers to sparsely populated barangays lying outside urban communities. Most often these areas posed accessibility problems to social services and facilities.

Social services – this covers expenditures for education, health, social security, labor and employment, housing and community development and other social activities.

Solid waste - refer to all discarded household, commercial waste, non-hazardous institutional and industrial waste, street sweepings, construction debris, agriculture waste, and other non-hazardous/non-toxic solid waste.

Solid waste management - the discipline associated with the control of generation, storage, collection, transfer and transport, processing, and disposal of solid wastes in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics, and other environmental considerations, and that is also responsive to public attitudes.

Strategic Agriculture and Fisheries Development Zones (SAFDZ) - refers to the areas within the NPAAAD identified for production, agro-processing and marketing activities to help develop and modernize with the support of government, the agriculture and fisheries sectors in an environmentally and socio-culturally sound manner.

Telecommunication – any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio optical or any electronic system.

Tourist Arrivals – refers to total number of visitors/tourist arrivals. This is tangible yardstick to the tourist industry performance.

Tourist Receipts – revenues derived from consumption expenditures or payments for goods and services made by local and foreign visitors.

Tourist Spots – a particular area, site/spot man-made or natural, known for its unique tourist/visitor drawing attributes and activities. It may be classified according to its social, cultural, natural, historical, scientific, religious and recreational significance.

Underemployed – employed persons who expresses the desire to have additional hours of work in their present job or an additional job, or to have a new job with longer working hours.

Underemployment rate – ration (in percent) of the total number of employed persons who want additional work to the total number of employed persons.

Unemployed – persons, who during the reference period, are 15 years old and over as of their last birthday and who have no job/business and are actively looking for work. Also considered as unemployed persons without job or business who were reported as available for work but were not looking for work because of their belief that no work is available or because of temporary illness/disability, weather, pending job application or waiting for job interview.

Unemployment rate – proportion of the total number of unemployed persons to the total number of persons in the labor force.

Urban or Built-up Areas

Low Density – less than one hundred fifty (150) persons per hectare of urban or built-up area.

Medium Density – one hundred fifty one (151) to two hundred fifty (250) persons per hectare of urban or built-up area

High Density – more than two hundred fifty (250) persons per hectare of urban or built-up area.

Urbanization level – refers to the percentage of urban population to the total population in the area (municipality).

Urban Population – refers to the population residing in the urban areas as classified by NSO.

Watershed – is a land area drained by a stream or fixed body of water and its tributaries having a common outlet for surface run-off.

Water supply – a general term for the sources of water for the public or private use. Also refers to the furnishing of good potable water under satisfactory pressure for domestic, commercial, industrial and public services, and an adequate quantity of water under reasonable pressure for fire fighting.

Zoning Ordinance - refers to a local legislation approving the development/land providing for the regulations and other conditions on the uses of land including the limitation on the infrastructure that may be placed within the territorial jurisdiction of a city or municipality.

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