



# *Message*



***To my beloved Dabaonons,***

Contained in this Provincial Development and Physical Framework Plan (PDPFP) Update is our long-term vision for Davao del Norte. Like a painter who leaves imprints of his imagination on his canvass, we too have expressed in concrete language our dreams for our people in this book.

Part of this describes the present state of our province, its current demography, existing land-use, and socio-economic indicators. These are the outcomes of the past administrations' development thrusts, and we are using these as our solid foundation upon which we shall build yet another bold and daring development plan. These rich descriptive data can be valuable inputs to our research community to make revealing outputs for our decision-makers.

This document also clearly spells out how we can go about towards the future using our present strengths. As planning is "primarily a way of thinking about the future" according to the economist John Friedmann, we hereby laid our policy directions encapsulated in what is now a widely known acronym P.E.O.P.L.E. This is the roadmap through which we can arrive at our desired future state.

We believe that the existing degree of underdevelopment is brought about by the growth imbalance, we are convinced that these are due in part to the past public policies which current development knowledge render unsound. Practical adjustments shall lead us towards an ensured balanced growth between the rural and urban sectors. This is the underlying theme that every keen reader must fully grasp.

Through the guidance of the Almighty, we were able to conceive of this, and through the same guidance we shall pin our hope to attain them.

Onward to prosperity! Mabuhay!

A handwritten signature in black ink, appearing to read 'Rodolfo P. Del Rosario'. The signature is stylized with a series of vertical strokes and a wavy line at the end.

**RODOLFO P. DEL ROSARIO**  
Governor



## **Foreword**

The Provincial Development and Physical Framework Plan (PDPFP) of the Province of Davao del Norte, 2014-2022 Update, is a planning document prepared by the Provincial Government of Davao del Norte to set out its policy directions guiding the development activities and use of land and available resources in the province. The policies and proposals in the (PDPFP) form a core part of the province's vision of how the area should be promoted and protected in terms of the development and use of land and resources. This plan presents a vision that will make the Province resilient to disasters and adaptive to climate change and globally competitive. The plan will take us from now until the year 2022; a period during which significant changes are envisaged in the way we live and work.

The vision is encompassed by the prevailing conditions, issues and problems which the province faces and seeks opportunities for physical, economic, social, environmental and institutional improvement and growth. From the issues and concerns, development goals, objectives and strategies have emerged to guide all planners and program implementers to align their respective management and development endeavors to the vision of development of the province for the ensuing years.

The preparation of the PDPFP was based on the rationalized local planning system which veers from being highly technocratic utilizing a simplified process and encouraging more participation and consultation. This had opened an extensive opportunity for inter-agency, NGO and public involvement. Many comments and objections were received at the issues, consultative draft and plan finalization stages. All of the comments were considered, of which necessary revisions were undertaken so as to improve the quality of the said plan. Salient comments and suggestions were also incorporated in the plan.

The Plan was prepared by the PDPFP Technical Working Group composed of agencies from the national and local offices, the LGUs and the private sector. The preparation was under the technical assistance of the National Economic Development Authority of Region XI (NEDA XI). NEDA with funding assistance from the United Nations Development program, AusAID and the New Zealand Aid Program (NZAP) formulated the guidelines on Mainstreaming Disaster Risk Reduction and Climate Change Adaptation in Subnational Development and Land Use/Physical Framework Planning and facilitated capability development seminars to LGUs in mainstreaming DRR-CCA in local development planning processes. DRR-CCA dimension and the vulnerability of the different sectors to the various hazards were integrated and discussed lengthily in the physical, economic, social, environment and institutional sectors in the planning environment of this document. It is important to inform the readers and users of this document that since this is a development indicative plan, the land area used in the tables and discussions is not authoritative with due consideration to the boundary conflicts between LGUs that still remain to be settled.

It is hoped that this document will stimulate the interest of our local and national leaders to support and make full use of this plan as basis for further development efforts for the province of Davao del Norte. Furthermore, the realization of the development goals indicated in this plan needs the utmost support from individuals and groups to generate further development contributions in the future. The plan is also a convenient vehicle that can bring in key contributions from wider people participation.



REPUBLIC OF THE PHILIPPINES  
PROVINCE OF DAVAO DEL NORTE

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**RODOLFO P. DEL ROSARIO**  
*Governor*

### EXCERPTS FROM THE MINUTES OF THE PROVINCIAL DEVELOPMENT COUNCIL MEETING HELD LAST MARCH 16, 2016 AT THE BULWAGAN NG LALAWIGAN, GOVERNMENT CENTER, MANKILAM, TAGUM CITY

#### PRESENT :

Hon. Rodolfo P. del Rosario	-	Provincial Governor (Presiding Officer )
Hon. Lolita A. Moral	-	Mayor, B.E. Dujali
Mr. Romeo L. Castañaga	-	Prov'l. Director, Dept. of Trade & Industry
Mr. Alex C. Roldan	-	Prov'l. Director, Dept. of Interior & Local Gov't.
Dr. Josephine L. Fadul	-	Schs. Div. Superintendent, DepEd DDN
Ms. Erlinda G. Mamitag	-	Prov'l. Head, Dept. of Labor & Employment
Dr. Remegias G. Timonio	-	Prov'l. Director, Tech. Educ. Skills Dev't. Authority
Mr. Emmanuel A. Cacal	-	Prov'l. Officer, Nat'l. Comm. on Indigenous People
Ms. Providencia P. Nuñez	-	President, DDN- Prov'l. Council of Women
Ms. Luz T. Pereyras	-	President, Girl Scout of the Phils.-DDN Chapter
Mr. Perfecto P. Urdaneta	-	Managing Director, Davao Provinces Rural Dev't.
Ms. Araceli L. Ayuste	-	President, Provincial Tourism Council
Mr. Pedro B. San Jose	-	President, Tagum Friends of the Home Found.
Engr. Josie Jean R. Rabanoz	-	Prov'l. Planning & Dev't. Coord./PDC Secretary

#### WITH REPRESENTATIVE:

Hon. Antonio F. Lagdameo, Jr.	-	Congressman, 2 <sup>nd</sup> Congressional District rep. by Mr. Ronil Giovanni Israel
Hon. Janet G. Gavina	-	SP Member/Chair Comm. on Budget, Finance and Appropriation rep. by Ms. Mia Joyce B. Dumbase
Hon. Marcelino A. Perandos	-	Mayor, Carmen rep. by Ms. Gloria B. Migue, A.A.VI
Hon. Aniano P. Antalan	-	Mayor, Island Garden City of Samal rep. by Ms. Elenita E. Glan, PO III
Hon. Nestor L. Alcoran	-	Mayor, New Corella rep. by Mr. Joel A. Quinanahan, OIC MPDC
Hon. James G. Gamao	-	City Mayor, Panabo City rep. by Ms. Aurora M. Lauron, CPDC
Hon. Arnel S. Sitoy	-	Mayor, San Isidro rep. by Mr. Renalbert L. Aurelio, MPDC



Hon Allan L. Rellon	-	City Mayor, Tagum City Rep. by Mr. Roderick C. Onong, PEO II
Mr. Orly T. Cariazo	-	OIC, PENR Officer, DENR rep. by Ms. Alma M. Millana, Forester
Engr. Lorna T. Ricardo	-	District Engineer, DPWH rep. by Engr. Jezabel E. Tuling, Engr. II
Engr. Judy Donna dA. Nueva Ecija-	-	Prov'l. Science & Tech. Officer, DOST rep. by Ms. Leselle I. Abatol, SRS II
Ms. Jocelyn C. Seno	-	Prov'l. Agrarian Reform Officer, DAR rep. by Ms. Melina C. Avila, Engr. II
Mr. Epifanio Loyola	-	Pres., Prov'l. Agriculture & Fisheries Council rep. by Mr. Virgilio D. Tagnipez, Vice-Chair

**ABSENT :**

Hon. Victorio R. Suaybaguio, Jr.	-	Vice Governor/PDC Vice Chair
Hon. Anthony Rafael G. Del Rosario	-	Congressman, 1 <sup>st</sup> Congressional District
Hon. Edgar T.Castillo	-	SP Member/Pres. FABC
Hon. Joseph Nilo F. Parreñas	-	Mayor, Asuncion
Hon. Edgardo L. Timbol	-	Mayor, Kapalong
Hon. Benigno R. Andamon	-	Mayor, Sto. Tomas
Hon. Basilio A. Libayao	-	Mayor, Talaingod
Dr. Tweet A. Malbog	-	President, Rotary Club of Tagum LACES
Mr. Cristito M. Calig-onan	-	Chief Executive Officer, TREES
Engr. Dexter G. Coquilla	-	President, Kiwanis Club of Tagum
Ms. Nenita R. Malbas	-	President, Tagum City Chamber of Commerce & Industry
Mr. Saturnino D. Simbajon	-	President, DDN- Fed'n. of Irrigator's Assoc.

**OTHERS PRESENT :**

Ms. Norma A. Lumain	-	P.G. Dept. Head, PBO
Dr. Anastacia G. Notarte	-	P.G. Dept. Head, PAGRO
Ms. Arlene M. Semblante	-	P.G. Dept. Head, PSWDO
Engr. Raul G. Mabanglo	-	P.G. Dept. Head, PEO
Atty, Edd Mark Wakan	-	P.G. Dept. Head, PLO
Mr. Romulo D. Tagalo	-	OIC, P.G. Dept. Head, PENRO-LGU
Mr. Samson J. Sanchez	-	P.G. Dept. Head, PGSO
Ms. Arlene M. Semblante	-	P.G. Dept. Head, PSWDO
Mr. Sofonias Gabonada	-	P.G. Dept. Head, PIO
Atty. Jennifer B. Namoc-Yasol	-	Prov'l. Administrator rep. by Ms. Evelyn C. Bulaga, SAO
Dr. Agapito B. Hornido	-	P.G. Dept. Head, PHO rep by Mr. Dominador Jadraque, AO
Ms. Regina C. Ricafort	-	P.G. Dept. Head, PTO rep. by Ms. Evelyn Espra, LRCO IV
Atty. Felix S. Alicer, CE	-	Asst. Regional Director, DENR XI
Mr. Joel Pardillo	-	SEMS, DENR XI

Mr. Denis Rraggio	-	Woodfields COnsultant
Ms. Jessica Amoris	-	Woodfields Consultants
Ms. Marcelita D. Pardillo	-	DENR XI- CENRO
Ms. Emelita R. Alfarero	-	DENR XI- CENRO
Ms. Ro-ann U. Granebo	-	CDA, PENRO-LGU
Mr. Darwin A. Bermudez	-	Admin. Asst., PENRO-LGU
Mr. Freddie B. Savillo	-	Forester II, DENR Panabo
Ms. Jane P. Bantilan	-	MPDC, BE Dujali
Ms. Anita G. Juntilla	-	Asst. P.G. Dept. Head, PPDO
Mr. Nelson F. Plata	-	PO IV, PPDO
Ms. Araceli N. Cajes	-	PO III, PPDO
Engr. Hazel C. Zafra	-	PDO III, PPDO
Ms. Mary Jean T. Hermo	-	PO II, PPDO
Ms. Ma Theresa V. Catao	-	PDO IV, PPDO
Ms. Mildred B. Funtilon	-	PEO IV, PPDO
Ms. Lorilei A. dela Torre	-	AAIII, PPDO

#### **PDC RESOLUTION NO. 01 SERIES OF 2016**

#### **A RESOLUTION APPROVING AND ENDORSING THE DAVAO DEL NORTE PROVINCIAL DEVELOPMENT AND PHYSICAL FRAMEWORK PLAN CY 2014-2022 UPDATE TO THE SANGGUNIANG PANLALAWIGAN FOR APPROPRIATE ACTION**

**WHEREAS**, the Provincial Government of Davao del Norte through the technical assistance of the Provincial Development and Physical Framework Plan-Technical Working Group (PDPFP-TWG) has formulated the Provincial Development and Physical Framework Plan (PDPFP) CY 2014-2022 Update;

**WHEREAS**, pursuant to Republic Act 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010, the authority and responsibilities for implementing the Disaster Risk Reduction and Climate Change Adaptation (DRR-CCA) measures are now centralized to the local government units;

**WHEREAS**, the updating of the PDPFP is in compliance to the national government's advocacy to promote the mainstreaming and integration of the DRR-CCA concept in the local development policies, plans and budgets;

**WHEREAS**, integrating and mainstreaming the DRR-CCA to the PDPFP is the initial step of the province in coming up with a pre-emptive, anticipatory and pro-active risk reduction plan which is more sustainable and cost-efficient in reducing vulnerability to disasters of the physical and human resources of Davao del Norte and make the communities disaster and risk resilient and climate change adaptive;



**WHEREAS**, this august Body, found that the updated PDPFP contains the long term vision of the province and identifies development goals, strategies, objectives, targets and corresponding programs, projects and activities equally significant to realize the development thrusts and priorities of the Province of Davao del Norte;

**WHEREAS**, in the full council meeting of the Provincial Development Council all components of the PDPFP were thoroughly deliberated and considered;

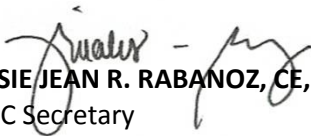
**WHEREFORE**, upon the motion of Mr. Perfecto D. Urdaneta, Managing Director of Davao Provinces Rural Development Inc. and duly seconded by Hon. Lolita A. Moral, Mayor of BE Dujali, be it;

**RESOLVED** as it is hereby resolved to approve and endorse the Davao del Norte Provincial Development and Physical Framework Plan (PDPFP) CY 2014-2022 Update to the Sangguniang Panlalawigan for their consideration and appropriate action;


**RESOLVED FURTHER**, that copies of this resolution be furnished to the Sangguniang Panlalawigan for their consideration and appropriate action and the Provincial Planning and Development Office for their information and guidance;

**CARRIED UNANIMOUSLY.**

**I HEREBY CERTIFY** to the correctness of the above-quoted resolution.

  
**JOSIE JEAN R. RABANOZ, CE, MPA**  
PDC Secretary  
PG. Department Head

Approved :

  
**RODOLFO P. DEL ROSARIO**  
Governor  
PDC Chair



**EXCERPT FROM THE MINUTES OF THE 22<sup>ND</sup> REGULAR SESSION OF THE SANGGUNIANG PANLALAWIGAN OF DAVAO DEL NORTE (TERM 2013-2016) HELD AT THE SESSION HALL, PROVINCIAL GOVERNMENT CENTER (CAPITOL), TAGUM CITY, ON MONDAY, JUNE 6, 2016**

**Present:**

Hon. Victorio R. Suaybaguio, Jr., MPA	Vice-Governor (Regular Presiding Officer)
Hon. Raymond Joey D. Millan	Member
Hon. Janet G. Gavina	Member
Hon. Vicente C. Eliot, Sr.	Member
Hon. Alan R. Dujali, MPA	Member
Hon. Hernanie L. Duco	Member
Hon. Ely C. Dacalus	Member
Hon. Ernesto T. Evangelista, Sr.	Member
Hon. Edgar T. Castillo, RN, DPA	Member/FABC
Hon. Tristan Royce R. Aala, MDMG	Member /PCL
Hon. Victor M. Pandian	Member/IPMR

**On Official Business:**

Hon. Shirley Belen R. Aala	Senior Board Member (Davao City)
Hon. Robert L. So	Member (Tagum City)

**Absent: None**

*(Sponsors: Hon. Ely C. Dacalus, Hon. Raymond Joey D. Millan, Hon. Vicente C. Eliot, Sr., and Hon. Alan R. Dujali, MPA)*

**RESOLUTION NO. 272**

**APPROVING THE DAVAO DEL NORTE  
PROVINCIAL DEVELOPMENT AND  
PHYSICAL FRAMEWORK PLAN CY 2014-  
2022**

**WHEREAS**, a letter dated 18 April 2016 of Mr. Samson J. Sanchez, MPA, CSEE, (Provincial General Services Officer) OIC-Provincial Administrator, this Province, duly received by the Office of the Secretary to the Sangguniang Panlalawigan on April 19, 2016, endorsed to this August Body, PDC Resolution No. 01 Series of 2016 of the Provincial Development Council, this Province, was presented for appropriate legislative action;

**WHEREAS**, the aforesaid measure was referred to the Committee on Human Settlements, Planning and Development for review and recommendation;

**WHEREAS**, Provincial Development Council (PDC) Resolution No. 01 Series of 2016, "A resolution approving and endorsing the Davao del Norte Provincial Development and Physical Framework Plan CY 2014-2022 update to the Sangguniang Panlalawigan for appropriate action", supports the referred measure;

**WHEREAS**, the Committee met and thoroughly discussed and deliberated on the merits of the said measure and per Committee Report



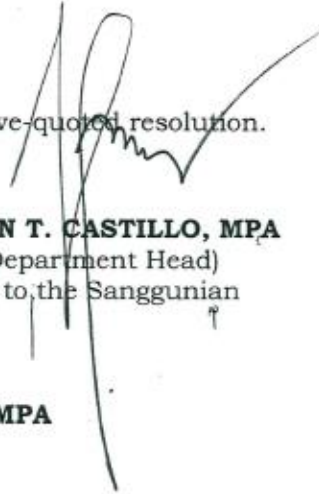
No. 21, dated May 25, 2016 finally recommended to confirm the same for being in order.

**WHEREFORE, BE IT RESOLVED,** by the Sangguniang Panlalawigan in Session Assembled, to approve, as it is hereby approved, the Davao del Norte Provincial Development and Physical Framework Plan CY,2014-2022;

**RESOLVED, FURTHER,** that copy of this resolution be forwarded to Honorable Rodolfo P. del Rosario, Governor, through the OIC-Provincial Administrator, this Province, for appropriate action, let a copy of the same be furnished the Provincial Planning and Development Coordinator, Provincial Planning and Development Office, this Province, for her information and record.


**CARRIED.**

I hereby certify to the correctness of the above-quoted resolution.



**DENNIS DEAN T. CASTILLO, MPA**  
(P. G. Department Head)  
Secretary to the Sanggunian

**ATTESTED:**



**VICTORIO R. SUAYBAGUIO, JR., MPA**  
(Vice-Governor)  
Regular Presiding Officer

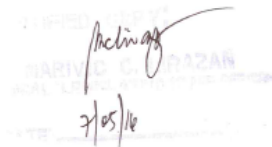
**APPROVED:**



**RODOLFO P. DEL ROSARIO**

Governor

JUN 24 2016  
Date Signed



Official stamp: **PROVINCIAL ADMINISTRATOR**  
**DARIN C. RAZAN**  
2/05/16

## ACKNOWLEDGMENT

The Provincial Development and Physical Framework Plan of Davao del Norte was updated through the joint effort and cooperation of the various national and local government agencies, non-government organizations/private sectors and several individuals.

In recognition of the various roles played by these agencies and individuals, the Provincial Technical Working Group (PTWG) expresses deep gratitude and most sincere appreciation to the following:

- The National Economic Development Authority (NEDA) thru the program funded by the United Nations Development Program (UNDP), Australian Aid for International Development (AusAID) and the New Zealand Aid Program (NZAP), in formulating the guidelines on Mainstreaming Disaster Risk Reduction and Climate Change Adaptation in Subnational Development and Land Use/Physical Framework Planning.
- The National Economic Development Authority of Region XI for the capability building and technical assistance in the formulation of the Plan; for their patience, dedication and untiring efforts in imparting their knowledge and extending their technical skills and expertise to the Provincial Core Team.
- The Honorable Provincial Governor, Hon. Rodolfo P. del Rosario, for his inspiration, encouragement and financial support in the planning processes.
- Ms. Gemma C. Borreros, PRMF Provincial Manager for sharing her talents and expertise in facilitating and guiding the PDPFP-TWG thru workshops and writeshops relative to the formulation of the updated plan.
- The following National Government Agencies for providing data and/or technical personnel:

Department of Interior and Local Government (DILG)  
Department of Trade and Industry (DTI)  
Department of Labor and Employment (DOLE)  
National Irrigation Administration (NIA)  
Technical Education and Skills Development Authority (TESDA)  
Department of Education, Culture and Sports (DECS)  
Philippine National Police (PNP)  
Bureau of Fire Protection (BFP)  
Department of Agrarian Reform (DAR),  
National Census and Statistics Office (NSO)  
Bureau of Agricultural Statistics (BAS)  
Department of Environment and Natural Resources (DENR); and  
Department of Public Works and Highways (DPWH).

- The Provincial Government Offices for their cooperation in sharing data and information as well as technical assistance from the personnel, namely:

Provincial Agriculturist's Office  
Provincial Veterinarian's Office



Provincial Environment and Natural Resources Office  
Provincial Treasurer's Office  
Provincial Budget Office  
Provincial Assessor's Office  
Provincial Accountant's Office  
Provincial Social Welfare and Development Office  
Provincial Governor's Office (PDRRMD)  
Provincial Administrator's Office  
Provincial Engineer's Office  
Provincial Human Resource Management Office; and  
Provincial Health Office

- The following non-government organizations (NGOs) of the Provincial Development Council :

Provincial Tourism Council of Davao del Norte  
Girl Scout of the Philippines-DDN Council  
Davao Provinces Rural Dev't. Institute, Inc.  
Davao Del Norte Federation of Irrigators Association, Inc.  
Kiwanis Club of Tagum  
Rotary Club of Tagum Golden L.A.C.E.S  
Tagum City Chamber of Commerce and Industry Inc. (TCCCII)  
Davao del Norte Province Council of Women  
Association of Friends of the Home for the Aged, Inc.  
Tribal Education on Ecological System (TREES)  
Prov'l. Agriculture & Fisheries Council (PAFC)

- The City and Municipal Government Units for facilitating the gathering of data as inputs to the Plan and technical assistance of City/Municipal Planning and Development Coordinators.
- The Private Sectors: Banana Plantations, DANECO, Davao Light and Power Company, Inc. CRUZTELCO Telephone, DATELCO, for their support and willingness to share data.
- Those who in one way or the other have contributed their share in the updating of this planning document.
- Above all, to the **Divine Providence** whose bountiful blessings and loving guidance made possible the completion of the Provincial Development and Physical Framework Plan CY 2014-2022 Update.

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<b>AADT</b>	Annual Average Daily Traffic
<b>AAGR</b>	Average Annual Growth Rates
<b>ADB</b>	Asian Development Bank
<b>AFMA</b>	Agriculture and Fishery Modernization Act
<b>AIP</b>	Annual Investment Plan
<b>ALS</b>	Alternative Learning System
<b>APGR</b>	Annual Population Growth Rate
<b>BAS</b>	Bureau of Agricultural Statistics
<b>BFPMS</b>	Barangay Forest Protection and Management Scheme
<b>BLGF</b>	Bureau of Local Government Finance
<b>BN</b>	Below Normal
<b>BNVL</b>	Below Normal Very Low
<b>BPHRE</b>	Bureau of Post Harvest Research and Extension
<b>BSWM</b>	Bureau of Soils and Water Management
<b>CADT</b>	Certificate of Ancestral Domain Title
<b>CARP</b>	Comprehensive Agrarian Reform Program
<b>CBFM</b>	Community Based Forest Management
<b>CCA</b>	Climate Change Adaptation
<b>CIP</b>	Communal Irrigation Project
<b>CIS</b>	Communal Irrigation Systems
<b>CM</b>	Corn Mill
<b>COPS</b>	Community Oriented Policing System
<b>C/RD</b>	Columnar/Recirculating Dryer
<b>CS</b>	Corn Sheller
<b>DA</b>	Department of Agriculture
<b>DANECO</b>	Davao del Norte Electric Cooperative
<b>DAR</b>	Department of Agrarian Reform
<b>DBM</b>	Department of Budget & Management
<b>DENR</b>	Department of Environment & Natural Resources
<b>DepEd</b>	Department of Education
<b>DD</b>	Diversion Dams
<b>DIDP</b>	Davao Integrated Development Program
<b>DIA</b>	Davao International Airport
<b>DILG</b>	Department of Interior & Local Government
<b>DLPC</b>	Davao Light and Power Company
<b>DOF</b>	Department of Finance
<b>DOH</b>	Department of Health
<b>DOT</b>	Department of Tourism
<b>DPWH</b>	Department of Public Works & Highways
<b>DRICP</b>	Davao Region Industry Cluster Plan
<b>DTI</b>	Department of Trade and Industry
<b>DRR</b>	Disaster Risk Reduction
<b>FIES</b>	Family Income and Expenditure Survey

<b>FA</b>	Farmer's Association
<b>FBD</b>	Flat Bed Dryer
<b>FM</b>	Frequency Modulated
<b>GAD</b>	Gender and Development
<b>GCI</b>	Global Competitiveness Index
<b>GIS</b>	Geographical Information System
<b>GK</b>	Gawad Kalinga
<b>GOCC</b>	Government Owned and Controlled Corporation
<b>HNP</b>	Health and Nutrition Posts
<b>HSA</b>	Highly Susceptible Area
<b>IEC</b>	Information, Education and Communication
<b>IFMA</b>	Integrated Forestry Management Agreement
<b>IRA</b>	Internal Revenue Allotment
<b>ISA</b>	Irrigator's Service Associations
<b>IGaCos</b>	Island Garden City of Samal
<b>KDH</b>	Kapalong District Hospital
<b>LGU</b>	Local Government Unit
<b>LMU</b>	Land Management Unit
<b>LARIS</b>	Land Resources Information System
<b>LALIK</b>	Lasang-Libuganon-Kipaliku
<b>LGC</b>	Local Government Code
<b>LGSEF</b>	Local Government Service Equalization Fund
<b>LTO</b>	Land Transportation Office
<b>LWUA</b>	Local Water Utility Administration
<b>MDG</b>	Millennium Development Goals
<b>MBN</b>	Minimum Basic Needs
<b>MFD</b>	Mobile Flash Dryer
<b>MDP</b>	Multipurpose Drying Pavement
<b>MS/T</b>	Multipurpose Sheller/Thresher
<b>NAT</b>	National Achievement Test
<b>NCRFW</b>	National Commission on the Role of Filipino Women
<b>NEDA</b>	National Economic Development Authority
<b>NIPAS</b>	National Integrated Protected Area System
<b>NPC</b>	National Power Corporation
<b>NER</b>	Net Enrolment Rate
<b>NPAAD</b>	Network of Protected Areas for Agricultural Development
<b>NSCB</b>	National Statistics & Coordinating Board
<b>NSO</b>	National Statistics Office
<b>PACCO</b>	Provincial Accountant's Office
<b>PAGRO</b>	Provincial Agriculturist Office
<b>PASSO</b>	Provincial Assessor's Office
<b>PBO</b>	Provincial Budget Office
<b>PDPFP</b>	Provincial Development and Physical Framework Plan
<b>PDC</b>	Provincial Development Council



<b>PDIP</b>	Provincial Development Investment Plan
<b>PDCC</b>	Provincial Disaster Coordinating Council
<b>PDRRMC</b>	Provincial Disaster Risk Reduction Management Council
<b>PEO</b>	Provincial Engineering Office
<b>PENRO</b>	Provincial Environment and Natural Resources
<b>PESO</b>	Public Employment Services Office
<b>PGO</b>	Provincial Governor's Office
<b>PGSO</b>	Provincial General Services Office
<b>PHO</b>	Provincial Health Office
<b>PHRMO</b>	Provincial Human Resource Management Office
<b>PIP</b>	Pump Irrigation Project
<b>PLO</b>	Provincial Legal Office
<b>PLUC</b>	Provincial Land Use Committee
<b>PPDO</b>	Provincial Planning & Development Office
<b>PNP</b>	Philippine National Police
<b>PO</b>	People's Organizations
<b>PPFP</b>	Provincial Physical Framework Plan
<b>PRNDP</b>	Provincial Road Network Development Plan
<b>PSWDO</b>	Provincial Social Welfare & Development Office
<b>PTO</b>	Provincial Treasurer's Office
<b>PVO</b>	Provincial Veterinary Office
<b>RAIC</b>	Regional Agri-Industrial Growth Center
<b>RDC</b>	Regional Development Council
<b>RDPFP</b>	Regional Development and Physical Framework Plan
<b>RIS</b>	River Irrigation System
<b>RM</b>	Rice Miller
<b>RPU</b>	Real Property Unit
<b>RT</b>	Rice Thresher
<b>RWSA</b>	Rural Waterworks and Sanitation Association
<b>SAFDZ</b>	Strategic Agriculture and Fisheries Development Zone
<b>SALLE</b>	Saug - Libuganon Left
<b>SEC</b>	Security and Exchange Commission
<b>SEF</b>	Special Education Fund
<b>SME</b>	Small Medium Enterprise
<b>SIFMA</b>	Socialized Industrial Forestry Management Agreement
<b>SPO</b>	Sangguniang Panlalawigan Office
<b>STW</b>	Shallow Tube Wells
<b>SSIP</b>	Small Scale Irrigation Project
<b>SWIP</b>	Small Water Impounding Projects
<b>SUD</b>	Sustainable Upland Development
<b>TDA</b>	Tourism Development Areas
<b>UMBN</b>	University of Mindanao Broadcasting Network
<b>VAW</b>	Violence Against Women
<b>VHSA</b>	Very Highly Susceptible Area



CHAPTER 1

# Introduction



## **INTRODUCTION**

### **1.0 HISTORICAL BACKGROUND**

Davao del Norte was created together with the provinces of Davao del Sur and Davao Oriental taken from the Great Davao Province by virtue of the bill authored by then Congressman. Hon. Lorenzo S. Sarmiento, Sr., which bill was passed into law and became known as R.A. 4867 dated 8 May 1967. It had an initial composition of 13 municipalities, namely: Asuncion, Babak, Compostela, Kapalong, Mabini, Mawab, Monkayo, Nabunturan, Panabo, Pantukan, Samal, Sto. Tomas and Tagum. Six (6) additional municipalities were created on May 6, 1970. These were Carmen, Kaputian, Maco, Montevista, New Bataan and New Corella. In 1996, the province had a total of twenty-two (22) municipalities with the creation of San Vicente (now named Laak) in 1979, San Mariano (now named Maragusan) in 1988 and Talaingod in 1990.

Governor Verulo C. Boiser was appointed by the President as the first governor of the province. He served the province for ten years, which was from July 1, 1967 to July 7, 1977. This corresponds to two years as appointed Governor and two terms as elected Governor.

The second Provincial Chief Executive was Governor Gregorio R. Dujali who was also extended a presidential appointment when the first Governor stepped down from the gubernatorial position on July 7, 1977. Like his predecessor, Governor Dujali also served Davao del Norte as the appointed governor for one year and as an elective governor for two terms until March 31, 1986.

On February 25, 1986, Her Excellency, Mrs. Corazon C. Aquino was installed as President of the Philippines by virtue of the "People Power" otherwise known as the EDSA Revolution. Hon. Prospero S. Amatong was appointed as the OIC-Governor of Davao del Norte on April 4, 1986. And on February 3, 1988, Governor Prospero S. Amatong took his oath as an elected governor of Davao del Norte.

On January 31, 1998, through Republic Act 8740, the province was divided into two (2) with the creation of Compostela Valley Province, and due to its division, 12 municipalities became part of the new province, while 11 municipalities were left to Davao del Norte. Other historical events that transpired in Davao del Norte together with the division of the province are the enactment of Republic Act No. 8471, creating the Island Garden City of Samal which comprise the municipalities of Babak, Samal and Kaputian; Republic Act No. 8472, converting the municipality of Tagum into a City, the seat of the provincial government; and Republic Act No. 8473 creating the municipality of Braulio E. Dujali. On March 31, 2001, the Municipality of Panabo was converted into a

City by virtue of Republic Act No. 1015, and then on March 15, 2004, the Municipality of San Isidro was created by virtue of Republic Act No. 9265, taken from the municipalities of Kapalong and Asuncion. With these turn of events the province now has three (3) cities and eight (8) municipalities with 222 barangays and a population of 847,440 based on the 2007 census.

Governor Prospero S. Amatong was able to serve the province for 10 years as an elected governor which ended on March 26, 1998 when he took his Oath of Office as Governor of the newly created province of Compostela Valley on the same day.

The national and local election period from April 1 to June 30, 1999 necessitated the appointment of interim provincial officials headed by Hon. Anecito M. Solis as the Acting Governor.

Hon. Rodolfo P. del Rosario was elected and sworn into office as the first Governor of the new Davao del Norte Province on July 1, 1998. In his term, he institutionalized the “Cluster Development” approach that grouped municipalities and cities for better developmental complementation. When he decided not to run in the 2004 elections, Hon. Gelacio P. Gementiza, the Mayor of Tagum became his successor who served for one term only as Governor.

2007-2010

**RDR WHEELS**  
—*Barangay  
Infrastructure  
Oriented*



In 2007, Governor Rodolfo P. del Rosario once again became the governor of the province of Davao del Norte. In his second time around, he leads the province with a much deeper purpose and commitment as he laid down his centre-piece of governance, the “RDR WHEELS” that spells out his strategic goals, development thrusts and directions, to wit:

- R- Roads and Infrastructure Development
- D- Development of Cooperatives in all sectors
- R- Reforms in Governance and Peace and Order
- W- Water and electricity development
- H- Health, Housing, Sanitation and Social Services
- E- Economic Development and Environment Protection/  
Rehabilitation
- E- Education, Culture, Sports and Human Development
- L- Livelihood and Skills Development Program
- S- Spiritual and Moral Recovery Program

In 2010 the RDR WHEELS development thrust has evolved into P.E.O.P.L.E. which means, people shall be the center, and the driver of their own development. This strategy will prepare and enhance the capacity of the province as it faces and absorbs challenges and opportunities brought about by the global integration.

The 2013-2016 Executive and Legislative Agenda (ELA) still pursue the P.O.P.L.E development thrust as it take full cognizance of two major factors that the provincial government must be wary of: one is the climate change adaptation and disaster risk reduction and management; the other is the ASEAN Free Trade Agreement (AFTA) which will take effect in 2015. P.E.O.P.L.E agenda laid out development directions and strategies, to wit:

- P- People Empowerment
- E – Education and Environment
- O- Optimum Health and Social Services
- P – Public-Private Partnership
- L – Link to the World
- E – Employment and Livelihood Opportunities



## 2.0 Plan Objectives and Context.

This Plan is formulated pursuant to Republic Act No.7160 known as the Local Government Code of 1991 which states that each Local Government Unit shall have a comprehensive multi-sectoral development plan to be initiated by its development council and approved by its Sanggunian.

The Provincial Government of Davao del Norte had its approved 2001 – 2010 Gender-Responsive Provincial Comprehensive Development Plan/Provincial Physical Framework Plan which provided the strategic direction of the province within its plan period. The said plan was supportive to the vision of the Philippine Plan for a gender-responsive development that is equitable, sustainable, free from violence, respectful of human rights, supportive of self-determination and the actualization of potentials, participatory and empowering.

The above mentioned plan has been updated/reformulated based on the issuance of Joint Memorandum Circular (JMC) No. 1, series of 2007 of DILG-NEDA-DBM and DOF, which aims to harmonize and synchronize local planning, investment programming, revenue administration, budgeting and expenditure management. The Plan will now be called the Provincial Development and Physical Framework Plan (PDPFP) of Davao del Norte.

The PDPFP will be the primary technical guide in the development of the province. Its specific objectives are:

1. Integrate the Provincial Development and Physical Framework Plan;
2. Enhance the vertical and horizontal linkages thru a synchronized planning, investment programming, revenue administration and budgeting;
3. Provide the analytical basis for understanding and identifying key development issues, problems, opportunities, goals and objectives;
4. Translate the vision into implementable strategies to attain its goals and objectives;
5. Identify programs, projects and activities that are consistent with the proposed strategies.

This plan merges the traditionally separate physical framework plan and the provincial development plan to integrate both the spatial and sectoral development and provide a connection between the medium and long-term concerns. It contains the long-term vision of the province and identifies development goals, strategies, objectives, targets and corresponding programs, projects and activities which serve as primary inputs to the provincial development investment programming and subsequent budgeting and plan implementation.

It is within the foregoing context that the updating of the previous plan has to be undertaken in accordance with guidelines set under JMC No. 1, series of 2007 and that the Provincial Development and Physical framework Plan (PDPFP) will now serve as the key link in the network of plans covering the national, regional, provincial, city/municipal levels.

At the provincial level, the PPAs derived from the PDPFP will be the basis for a multi-year Provincial Development Investment Program (PDIP) and the Annual Investment Program (AIP), which is the basis for budgetary allocations.

For vertical linkages, the development goals and objectives cited in the PDPFP are aligned to the development goals and objectives of the national and regional government. Thus, there is an assurance that development efforts at the national and regional levels will be implemented at the local level. A close coordination between the province, its components cities and municipalities and all national government agencies is deemed necessary in order that there is unity of vision and to encourage integration and complementation at all levels.

Part of the enhancement of the PDPFP is the integration and mainstreaming of the Disaster Risk Reduction and Climate Change Adaptation (DRR/CCA) concept in the plan.

With the passage of R.A. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010, the authority and responsibilities for implementing disaster risk reduction and climate change adaptation measures are now centralized to the local governments and requires efforts of all stakeholders.

Mainstreaming disaster risk reduction and climate change adaptation (DRR-CCA) to local development plans like the PDPFP is our initial step in coming up with a pre-emptive, anticipatory, and pro active risk reduction plan, which is more sustainable and cost efficient in reducing vulnerability to disasters of the people of Davao del Norte.

The National Economic and Development Authority with funding assistance from the United Nations Development Program, AusAID and New Zealand Aid Program (NZAP) formulated the guidelines on Mainstreaming DRR-CCA in Subnational Development and Land Use/Physical Planning and facilitated capability development seminars to LGUs in mainstreaming DRR-CCA in local development planning processes.

### **3.0 Coverage of the Plan**

#### **3.1 Historical Coverage**

The PDPFP is a six-year medium-term development plan, guided by a long-term vision. It is intended to coincide with two political terms of the Governor, each term consisting of three years, and is aligned with a full term of the national leadership. The planning analysis cited in the plan however, extends beyond the medium-term to consider longer-term trends. Such trends are considered necessary inputs to the identification of strategies and PPAs for the six-year plan period.

The Development Plan (update) shall cover the period 2014-2022, while the Physical Framework Plan shall cover the period starting with 2008 and extends to 2022.

### 3.2 Geographical Coverage

The primary level of geographical analysis is within the political boundaries of the province. Other provinces in the region and the country as a whole are also included as benchmarks in some of the analyses.

The analytical disaggregations used are the cities and municipalities of the province, while in some areas of study will use a barangay disaggregation to truly reflect a more realistic analysis. Grouping or clustering of municipalities as well as geographically delineated areas are used to create a clearer picture of the planning environment.

### 3.3 Sectoral Coverage

The planning environment of the PDPF under the new guidelines includes all the major sectors relevant to the development of the province. As much as possible and in order to establish comparability and context, sectoral data are consistent with regional/national and city/municipal data.

In terms of the traditional sectors that typically serve as template for public sector planning analysis and implementation, the core elements correspond as follows:

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

### 4.0 Outline of the Plan

The FIRST CHAPTER presents the background of the Province and the rationale for the formulation/updating of the Provincial Development and Physical Framework Plan, its Plan objectives, context, and coverage.

The SECOND CHAPTER presents the long-term vision with the corresponding mission of the province formulated through consultation of stakeholders.



The THIRD CHAPTER presents the planning environment which includes all major sectors relevant to the development of the province. To the extent possible and in order to establish comparability and context, sectoral data were made certain to be consistent with the regional, national and city/municipal data. Descriptions and analysis of the social, economic and physical environment of the province served as bases for identifying development challenges, issues and the subsequent course of action. Exposure and vulnerability of the sector to various hazards and risks and its implications and impacts are considered in every sector of the plan. After this an over-all physical framework of the province is presented.

The FOURTH CHAPTER presents the Monitoring and Evaluation Framework. M&E will look into PDPFP's accomplishments in relation to its contribution in the achievement of the goals of enhanced economic, environment, social and governance conditions of the province-in pursuance of the Vision of the province.



CHAPTER 2

# Vision/Mission



The existing Vision of the province was assessed using the Vision-Reality Gap Analysis. It is a tool that measure the performance of every sector or departments in terms of its contribution to the attainment of the key element of the Vision, vis-a- vis the current situation. The analysis revealed that although, the provincial government is on track in achieving its desired state, much is still to be done in terms of its full attainment. As a result, an enhanced Vision that is more responsive and significant to the current reality was formulated.

The provincial government takes full cognizance of two major factors that it must be wary of: one is the climate change adaptation and disaster risk reduction and management; the other is the ASEAN Free Trade Act or (AFTA) which will take effect in 2015. Both require the province to be resilient. Thus, global competitiveness and climate change adaptation and risk resiliency are among the key elements of the enhanced Vision of Davao del Norte.

## **VISION**

**A PREMIER PROVINCE IN PRODUCING EXPORT QUALITY AGRICULTURAL PRODUCTS THAT ARE GLOBALLY COMPETITIVE WITH CLIMATE CHANGE ADAPTIVE AND RISK-RESILIENT COMMUNITIES, SOCIAL EQUITY, IMPROVED QUALITY OF LIFE UNDER A TRANSPARENT AND RESPONSIVE GOVERNANCE.**

## **MISSION**

**WE THE OFFICIALS AND EMPLOYEES OF THE PROVINCIAL GOVERNMENT OF DAVAO DEL NORTE, COMMIT OURSELVES TO UPLIFT THE QUALITY OF LIFE FOR ALL DABAONONS THROUGH:**

- **TRANSPARENT, EFFECTIVE AND GENDER RESPONSIVE GOVERNANCE;**
- **ADOPTING A SCIENCE-BASED POLICY IN AGRICULTURE, CLIMATE CHANGE ADAPTATION AND DISASTER RISK REDUCTION AND MANAGEMENT;**
- **PROVIDING ADEQUATE FACILITIES AND SERVICES; and**
- **PROVIDING AVENUES FOR PEOPLE’S PARTICIPATION**

**THUS, ENSURING SUSTAINABLE DEVELOPMENT.**



CHAPTER 3

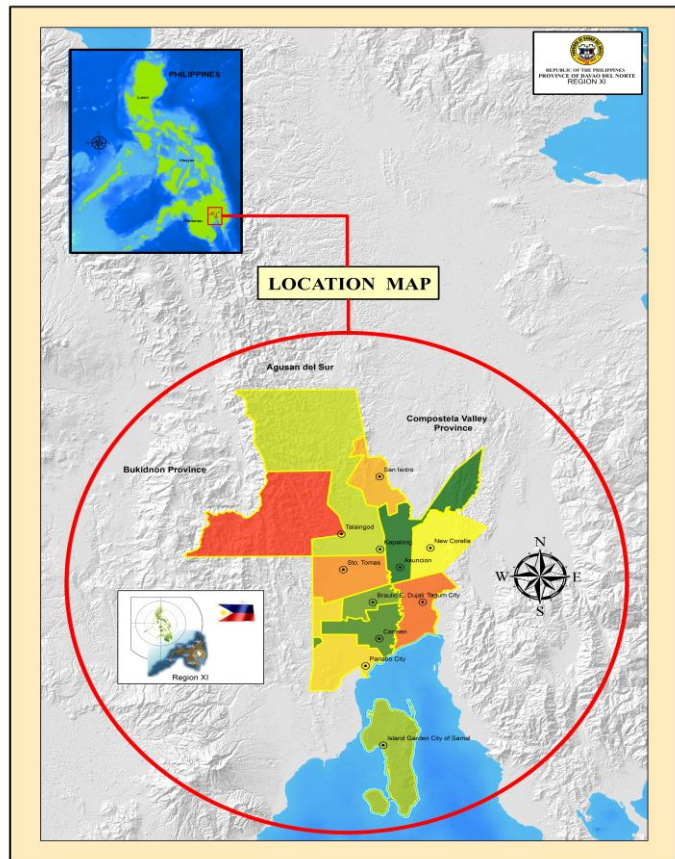
# The Planning Environment



**1.0 Location, Land area, and Political Subdivision**

Davao del Norte is strategically located at the southeastern part of Region XI, bounded by Agusan del Sur on the North, Bukidnon on the Northwest, Davao City on the West, Davao Gulf on the South and the Province of Compostela Valley on the East.

Davao del Norte had an initial composition of 13 municipalities upon its creation on May 8, 1967. However, on May 6, 1970, six additional municipalities were created, and between 1979 and 1990, another three additional municipalities were also created. In 1996, Davao del Norte had a total of twenty-two municipalities. Furthermore, on January 31, 1998, President Fidel V. Ramos signed Republic Act No. 8470 creating the Province of Compostela Valley out of Davao del Norte.



Along with the creation of Compostela Valley, were: the enactment of Republic Act No. 8471, creating the Island Garden City of Samal comprises the former municipalities of Babak, Samal and Kaputian; Republic Act 8472 converting Tagum Municipality into Tagum City, the seat of the provincial government center of Davao del Norte; and Republic Act 8473 creating the municipality of Braulio E. Dujali out of some barangays from Carmen and Panabo municipalities. Subsequently, on March 31, 2001 by virtue of Republic Act 1015 the Municipality of Panabo was also converted into a city. And lately, the Municipality of San Isidro was created on March 15, 2004 pursuant to Republic Act 9265. It was taken from six barangays of the Municipality of Asuncion and seven barangays from the Municipality of Kapalung. At present, Davao del Norte comprises eight (8) municipalities and three (3) cities with 223 barangays, sub-divided into two congressional districts. (Table No.3-1)

One distinguishing landmark in the province is the provincial government center located in Mankilam, Tagum city, which accommodates provincial and national offices, particularly the local government unit of Davao del Norte. The Davao del Norte Sports and Tourism Complex with sports facilities of international standards, located in the provincial government center is the latest landmark in the province.

Another landmark of the LGU of Davao del Norte is the transformation of the Office of Ministry of Human Settlements/Provincial Action Center into *Tahanan ng Punong Lalawigan*, the official residence of the Provincial Chief Executive of Davao del Norte. Also, adjacent to this edifice is the renovation of the former Department of Interior and Local Government Office into *Bulwagan ng Lalawigan* function hall, which caters most of the significant affairs of the province, like People’s Day, seminars and conferences since it can accommodate large crowds. Both buildings are within the compound of the provincial government center, made possible through the initiative of Governor Rodolfo P. del Rosario.

Quick Facts About Davao del Norte	
<b>Coverage</b>	<ul style="list-style-type: none"> <li>➤ 8 municipalities</li> <li>➤ 3 cities</li> <li>➤ 223 barangays</li> </ul>
<b>Capital/Seat of Government</b>	➤ Tagum City
<b>Population</b>	<ul style="list-style-type: none"> <li>➤ 945,764 (in 2010)</li> <li>➤ 273 persons/km<sup>2</sup></li> </ul>
<b>Land Area</b>	➤ 346,280 hectares
<b>Environmentally Critical Areas</b>	➤ 40,726 has. are prone to flooding, particularly along Tagum Libuganon River
<b>Water Resources</b>	➤ 15 major rivers with Lasang, Tagum/Libuganon, Saug and Tuganay as the bigger rivers
<b>Economy</b>	➤ Agriculture-based
<b>Mineral Resources</b>	➤ 44.8 million MT of non-metallic minerals
<b>Climate and Rainfall</b>	➤ Type IV with rainfall evenly distributed with no pronounced rainy season and dry season

Davao del Norte’s booming economy is evident by the presence of big shopping malls, commercial and service centers within the capital city of Tagum. Transport and access, communication facilities, and other utilities and requisites necessary for development are present and already in place in every local government unit, thus making the province investor-ready.

Other important resources in the province are the tourism sites and attractions in the Island Garden City of Samal, which offer white sand beaches, water sports, modern resorts and exciting diving facilities.

A recent initiative of the local government unit of Tagum City is to promote the place as a palm city, wherein palm trees are now visible along the national highway, major thoroughfares, and even subdivisions within the area giving popularity not only in the capital city but in the entire Province of Davao del Norte.

**Table No. 3-1: Land Area and Number of Barangays, by City/Municipality  
Province of Davao del Norte, 2013**

City/Municipality	Land Area ( Sq. Km. )	No. of Barangays
District I		
Asuncion	293.47	20
Kapalong	945.86	14
New Corella	321.48	21
San Isidro	152.49	13
Tagum City	182.54	23
Talaingod	454.96	3
District II		
Braulio E. Dujali	91.00	5
Carmen	166.25	20
Island Garden City of Samal	280.71	46
Panabo City	253.63	39
Sto. Tomas	320.41	19
DAVAO DEL NORTE	3,462.80	223

Source: DENR XI

Note: Land area is not authoritative, for planning purposes only.

## 2.0 Population and Settlements

### 2.1 Population: Regional and National Context

#### a. Size and distribution

Tagum City, the seat of the provincial government of Davao del Norte has the largest population among the cities and municipalities in the province. It has a total population of 242,801 or 25.7% share of the total provincial population during the 2010 census, while only occupying a land area of 182.54 sq km. or 5.3% of the provincial land area. (Table No. 3-2)

It is followed by Panabo City having a population of 174,364 or 18.4% share, third is the municipality of Sto. Tomas with 109,269 or 11.5% share, fourth is Island Garden City of Samal with 95,874 or 10% share, and the fifth are the municipalities of Carmen with 69,199 or 7.3%, Kapalong with 68,261 or 7.3% share of the total provincial population. (Table No. 3-2)

The rest of the municipalities of Davao del Norte, namely Asuncion ranks sixth with 55,844 or 6.0%. Seventh place is New Corella with 50,699 or 5.4%, eighth

place is Braulio Dujali with 28,339 or 3%, ninth placers are San Isidro with 25,548 or 2.7% and Talaingod with 25,566 sharing 2.7% of the total provincial population. (Table No. 3-2)

Accordingly, based on 2010 population of 945,764 and with an annual population growth rate (APGR) of 2.43, it is estimated that the population of Davao del Norte will reach 1,222,539 by 2020, and expected that the population size of the province will double in 29 years.

**Table No. 3-2: Population, Annual Population Growth Rate, Density, by City/Municipality Davao del Norte, 2000, 2007, 2010**

City/Municipality	Population			Population (% Share)			APGR	Density		Area	
	2000	2007	2010	2000	2007	2010	2007-2010	2007	2010	(Sq. km.)	%
Asuncion	46,910	50,731	55,844	6.3	6.0	6.0	3.56	173	190	293.47	8
Braulio E. Dujali	18,050	24,886	28,339	2.4	2.9	3.0	4.84	273	311	91.00	2
Carmen	55,144	61,656	69,199	7.4	7.3	7.3	4.29	371	251	275.16	8
Kapalong	57,966	61,763	68,261	7.8	7.3	7.3	3.71	65	72	945.86	27
New Corella	44,590	46,311	50,699	6.0	5.5	5.4	3.35	144	158	321.48	9
Panabo City	133,950	154,329	174,364	18.0	18.2	18.4	4.54	608	687	253.63	7
IGACOS	82,609	90,291	95,874	11.1	10.6	10.0	2.21	322	342	280.71	8
San Isidro	24,100	24,696	25,548	3.2	2.9	2.7	1.24	162	168	152.49	4
Sto. Tomas	84,367	97,210	109,269	11.3	11.5	11.5	4.35	303	341	320.41	9
Tagum City	179,531	215,967	242,801	24.1	25.5	25.7	4.35	1183	1,330	182.54	5
Talaingod	16,594	19,600	25,566	1.3	2.3	2.7	10.15	43	56	454.96	13
DAVAO DEL NORTE	743,811	847,440	945,764	100.0	100	100.0	4.07	245	245	3,462.80	100.0

Source: Philippine Statistics Authority  
Computations by Provincial Planning and Development Office

In comparison to the previous censuses, three cities and 1 municipality increased their population shares since 2000 and constituted 65% of the provincial population. These are Tagum City, Panabo City, and Sto. Tomas, Island Garden City of Samal. The rest of the municipalities shared 35% of the total provincial population. These are Kapalong, Carmen, Asuncion, New Corella, Braulio Dujali, San Isidro and Talaingod. (Table No. 3-2)

With this increasing population trend among the cities and municipalities, it can be observed that population is clustered towards the largest settlements in the province.



*Table No. 3-3: Population Shares, by City/Municipality  
Davao del Norte, 2000, 2007, 2010*

City / Municipality	Population (% share)			Cumulative Population			% change
	2000	2007	2010	2000	2007	2010	2000-2010
Asuncion	6.3	6.0	6.0	6.3	6.0	6.0	0.3
Braulio E. Dujali	2.4	2.9	3.0	8.7	8.9	9.0	-0.6
Carmen	7.4	7.3	7.3	16.1	16.2	16.3	0.1
Kapalong	7.8	7.3	7.3	23.9	23.5	23.6	0.5
New Corella	6.0	5.5	5.4	29.9	29	29.0	0.6
Panabo City	18.0	18.2	18.4	47.9	47.2	47.4	-0.4
IGACOS	11.1	10.6	10.0	59.0	57.8	57.4	1.1
San Isidro	3.2	2.9	2.7	62.2	60.7	60.1	0.5
Sto. Tomas	11.3	11.5	11.5	73.5	72.2	71.6	-0.2
Tagum City	24.1	25.5	25.7	97.6	97.7	97.3	-1.6
Talaingod	2.2	2.3	2.7	100.0	100.0	100.0	-0.5

*Source: Based on Census on Population, 1990, 2000, 2010*

*Computations by Provincial Planning and development Office*

#### **b. Density and urbanization**

The City of Tagum recorded the highest population density with 1,130 persons/square kilometer in 2010 census. On the other hand, the municipality of Talaingod has the lowest at 56 persons/square kilometer. All in all, the provincial data showed 273 persons/square kilometers. (Table No. 3-2)

Other cities/municipalities with population densities higher than the provincial average are Panabo City (687), Sto. Tomas (341), Island Garden City of Samal (342), and Braulio E. Dujali (311) persons/square kilometer (Table No. 3-2).

#### **c. Growth rate**

Between 2007-2010 censuses, the municipality of Talaingod exhibited the highest annual population growth rate (APGR) of 10.15% among the cities and other municipalities within the province. This may be the effect of road opening to other provinces for future linkages and exchange of goods and services and the formation of marketing outlets of products. (See Table No. 3-2)

On the other hand, the municipality of Braulio E. Dujali also experienced a high APGR of 4.84% in 2007-2010 censuses; maybe because of the existence of TADECO banana plantation, located in Barangay Tanglaw, as a result, there was an increase in the number of employees coming into the area between these years. (See Table No. 3-2)

**d. Densities and growth rates**

1. High density and fast-growing settlements: Tagum City, and Panabo City

Tagum City, the center of trade and commerce in the province does not only cater the neighboring cities and municipalities within the province; however, its strategic location extended its linkages as far as the provinces of Davao Oriental, Compostela Valley, Agusan del Sur, and Bukidnon. Panabo City, on the other hand, with its proximity to Tagum City and Davao City integrates the development of these big cities and compliments to the industrial activities of Davao City because of its seaport facility.

2. Low density and fast-growing settlements: Braulio E. Dujali, Sto. Tomas and the Island Garden City of Samal.

The municipality of Braulio E. Dujali is adjacent to Sto. Tomas, and as mentioned earlier, is the fastest growing municipality based on the 2007-2010 censuses. Maybe, one factor that contributed to the increase in its population is the existence of TADECO banana plantation located in Barangay Tanglaw. In like manner, the vast banana plantation in the municipality of Sto. Tomas definitely boosts the municipality's economic condition which is an avenue for population settlement in the area. Growth in the Island Garden City of Samal is attributed to the boom in its tourism industry as it offers pristine white beaches, good diving facilities and panoramic residential sites away from the hustle and bustle of city life.

3. Low density and slow-growing settlements: Carmen, Asuncion, New Corella, San Isidro, Kapalong, and Talaingod.

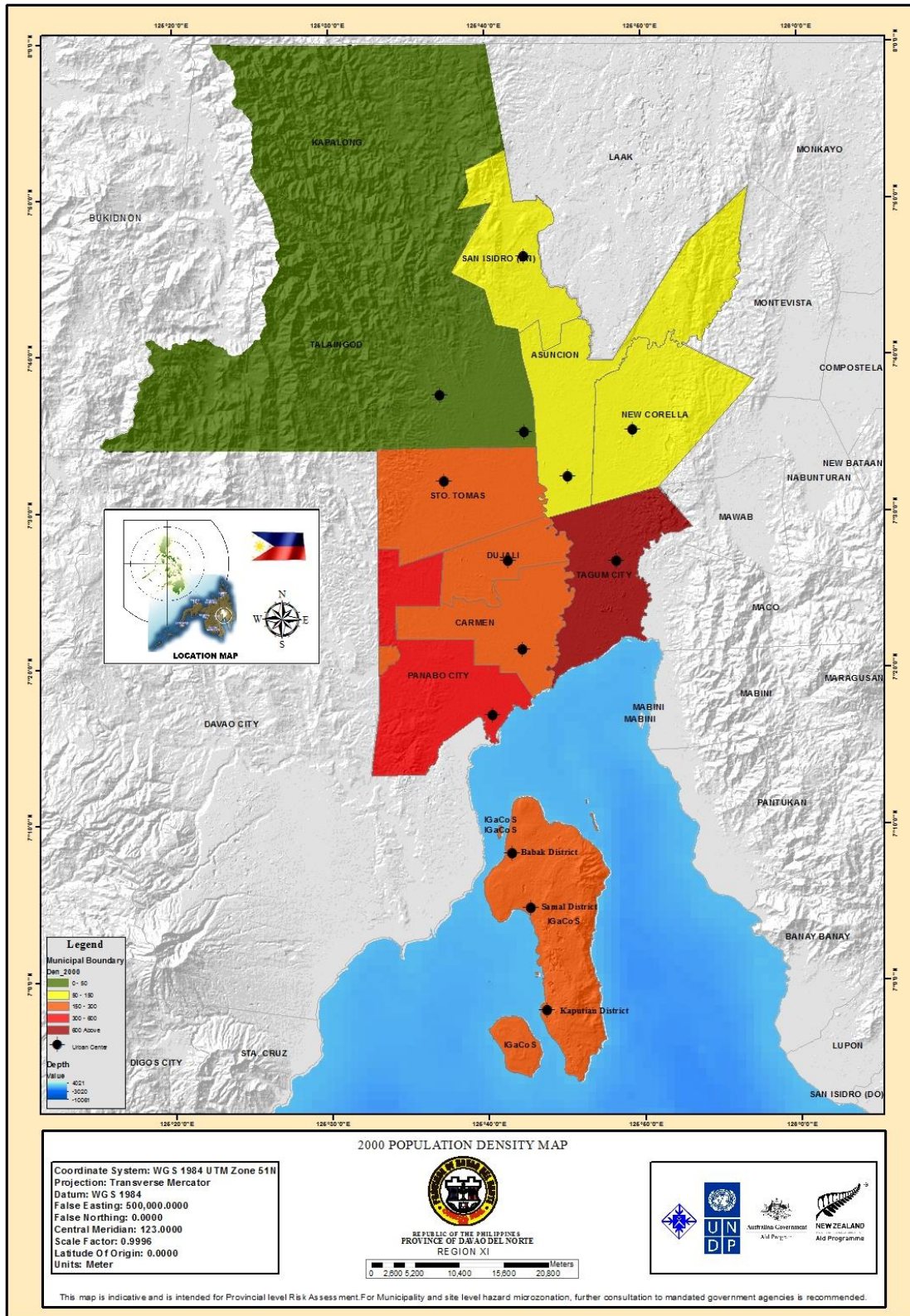
The municipalities of Asuncion and New Corella as neighboring local government units (LGUs) provided agricultural products and services to its big brother, Tagum City. The newly created municipality of San Isidro also provided agricultural products and services being one of the members and nearest municipality in Tagum cluster.

The municipality of Carmen located in the midway of two progressive cities of Tagum and Panabo provided services and likewise, covered by the influence area of Panabo City benefited from the economic activities of these cities.

The municipalities of Kapalong and Talaingod considering its distance from the urban centers of Tagum city and Panabo City also provided agricultural products and support services to these big cities.

These six municipalities of Davao del Norte contributed to the development of the province and further gave support to population growth.

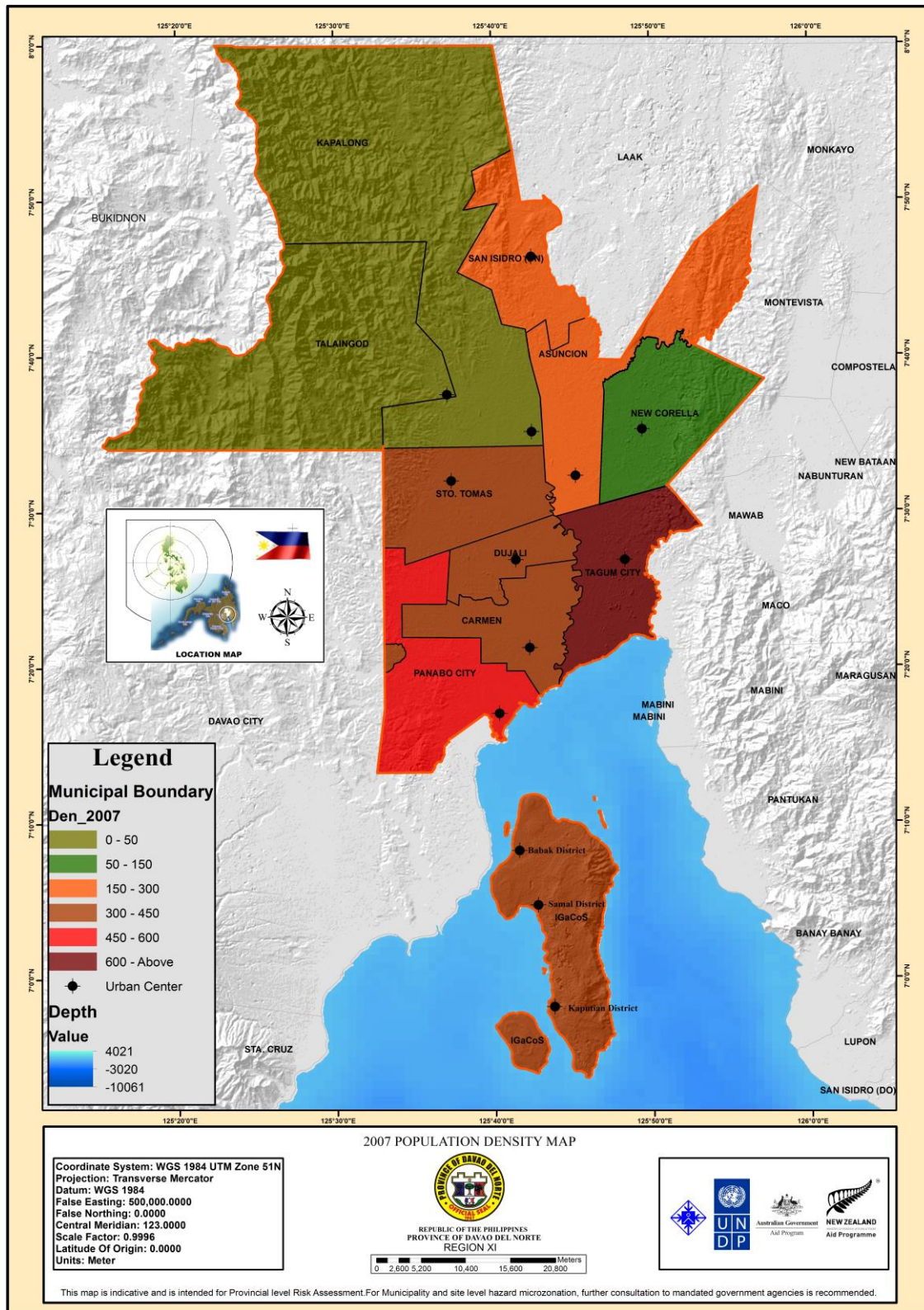
**Map 3: 2000 POPULATION DENSITY MAP**



Source: GIS Division, PPDO

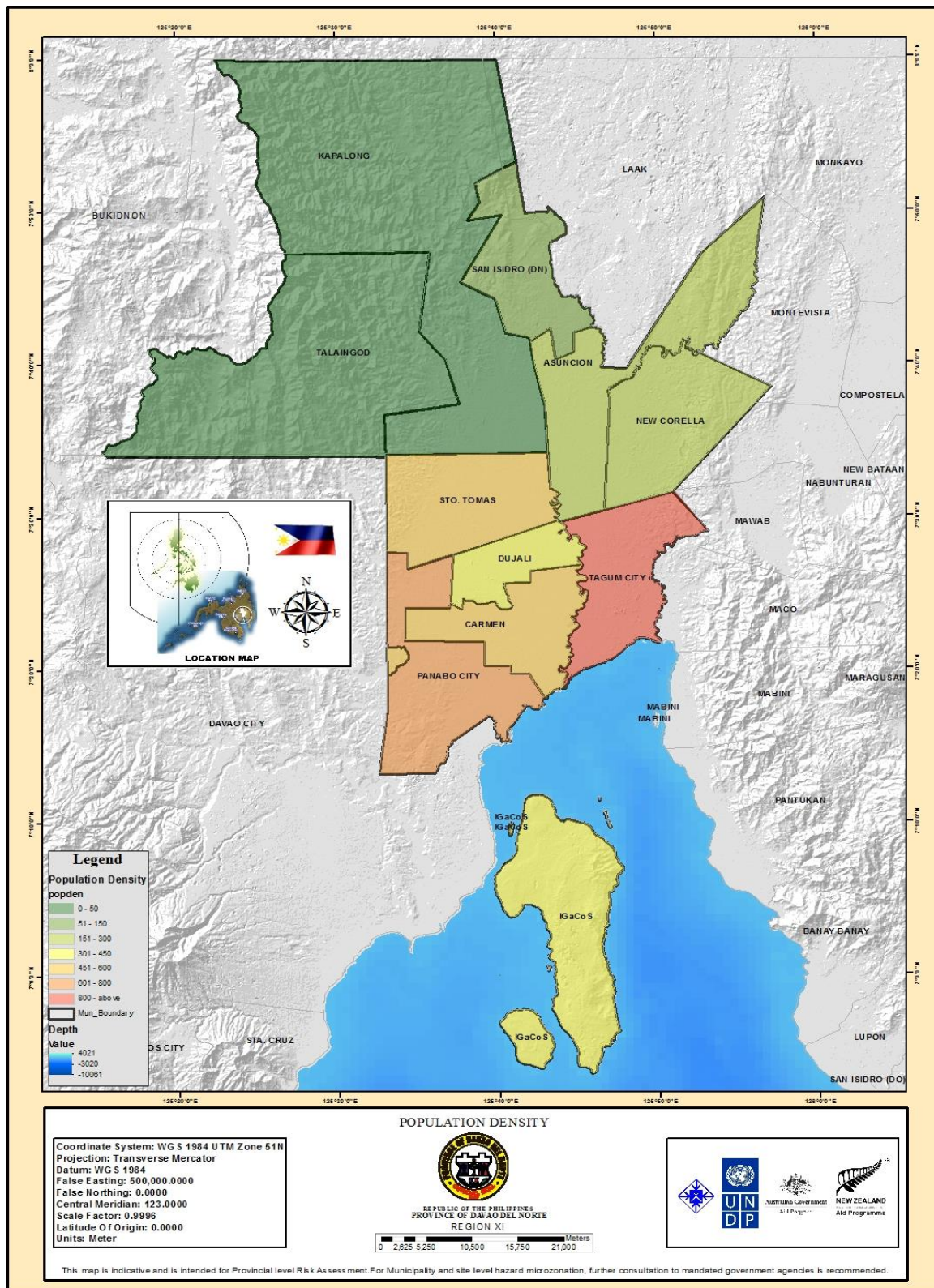


Map 4: 2007 POPULATION DENSITY MAP



Source: GIS Division, PPDO

**Map 5: 2010 POPULATION DENSITY**



Source: GIS Division, PPDO



**Table No. 3-4: Projected Population, by City/Municipality**  
Province of Davao del Norte, 2011-2022

LGU	2000	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Asuncion	46,910	55,844	57,828	58,845	59,880	60,933	62,005	63,095	64,205	65,334	66,483	67,652	68,842	70,052
BE Dujali	18,050	28,339	29,346	30,700	32,117	33,599	35,149	36,771	38,467	40,242	42,099	44,042	44,816	45,605
Carmen	55,144	69,199	71,658	73,304	74,987	76,709	78,470	80,272	82,116	84,001	85,930	87,903	89,449	91,022
Kapalong	57,966	68,261	70,687	71,852	73,036	74,240	75,464	76,707	77,972	79,257	80,563	81,891	83,331	84,797
New Corella	44,590	50,699	52,501	53,179	53,866	54,562	55,267	55,982	56,705	57,438	58,180	58,932	59,968	61,023
San Isidro	24,100	25,548	26,456	26,611	26,766	26,923	27,081	27,239	27,398	27,559	27,720	27,882	28,373	28,872
Sto. Tomas	84,367	109,269	113,152	116,117	119,159	122,281	125,485	128,773	132,147	135,609	139,162	142,808	145,320	147,875
Talaingod	16,594	25,566	26,474	27,644	28,865	30,140	31,471	32,861	34,313	35,828	37,411	39,063	39,750	40,449
IGCSamal	82,609	95,874	99,281	100,770	102,282	103,817	105,374	106,955	108,560	110,189	111,842	113,520	115,516	117,548
Panabo	133,950	174,364	180,560	185,384	190,338	195,423	200,644	206,005	211,510	217,161	222,963	228,920	232,946	237,043
Tagum City	179,531	242,801	251,429	259,135	267,078	275,263	283,700	292,396	301,357	310,594	320,114	329,925	335,727	341,631
Davao del Norte	743,811	945,764	979,372	1,003,541	1,028,374	1,053,890	1,080,111	1,107,056	1,134,749	1,163,212	1,192,467	1,222,539	1,244,039	1,265,916

Source: Provincial Planning and Development Office, 2000 & 2010 are actual census data from NSO, 2011 to 2022 are projections

**Table No. 3-5: Projected Both Sexes Total Household Population, by Age Group : 2011-2022**

Age Group	2007	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All Ages	843,044	937,785	975,471	1,015,045	1,056,622	1,133,306	1,180,195	1,229,504	1,281,382	1,335,991	1,385,002	1,445,646	1,509,576	1,577,007
Under 1	19,394	17,711	20,636	20,982	21,333	21,690	22,054	22,425	22,802	23,185	23,576	23,973	24,378	24,789
0-4	80,355	74,327	89,955	92,703	95,535	98,454	101,004	103,622	106,310	109,071	112,403	115,838	119,377	123,024
5-9	95,416	94,188	106,031	109,058	112,172	105,607	108,572	111,620	114,755	117,978	121,292	124,701	128,206	131,810
10-14	93,348	98,007	99,758	101,541	103,355	111,614	114,417	117,294	120,249	123,283	126,399	129,600	132,887	136,262
15-19	95,329	75,424	101,088	102,682	104,300	106,735	108,556	110,409	112,294	114,211	116,160	118,143	120,160	122,211
20-24	79,442	59,099	96,230	101,279	106,593	108,822	112,694	116,747	120,990	125,433	130,087	134,964	140,074	145,430
25-29	68,374	53,142	80,386	83,933	87,637	101,416	106,343	111,509	116,926	122,607	128,564	134,811	141,361	148,230
30-34	59,575	46,986	73,275	77,434	81,829	88,086	92,295	96,708	101,337	106,192	111,283	116,624	122,226	128,102
35-39	54,331	42,685	62,373	64,712	67,139	79,014	82,940	87,070	91,414	95,983	100,791	105,849	111,171	116,771
40-44	46,736	34,326	56,890	59,952	63,179	68,124	71,185	74,387	77,739	81,247	84,918	88,761	92,783	96,994
45-49	41,983	25,181	48,884	50,909	53,018	61,388	64,387	67,534	70,838	74,305	77,944	81,764	85,774	89,983
50-54	35,232	18,464	42,904	45,219	47,659	52,842	55,375	58,033	60,822	63,748	66,819	70,042	73,424	76,974
55-59	25,437	14,791	34,668	37,654	40,899	47,767	51,142	54,775	58,687	62,901	67,442	72,338	77,616	83,310
60-64	16,366	10,869	23,731	26,204	28,934	37,979	41,463	45,273	49,442	54,003	58,994	64,457	70,438	76,986
65-69	12,833	7,768	14,662	15,196	15,749	24,728	26,739	28,931	31,321	33,927	36,771	39,874	43,263	46,964
70-74	8,856	5,102	11,319	12,085	12,904	15,212	15,979	16,793	17,657	18,575	19,552	20,589	21,693	22,868
75-79	5,137	3,344	6,732	7,239	7,788	11,131	11,949	12,830	13,779	14,802	15,904	17,091	18,371	19,751
80 & over	4,900	2,765	5,949	6,265	6,597	7,436	7,839	8,263	8,709	9,181	9,677	10,201	10,752	11,334

Source: Provincial Planning and Development Office, 2000 & 2010 are actual census data from NSO, 2011 to 2022 are projections





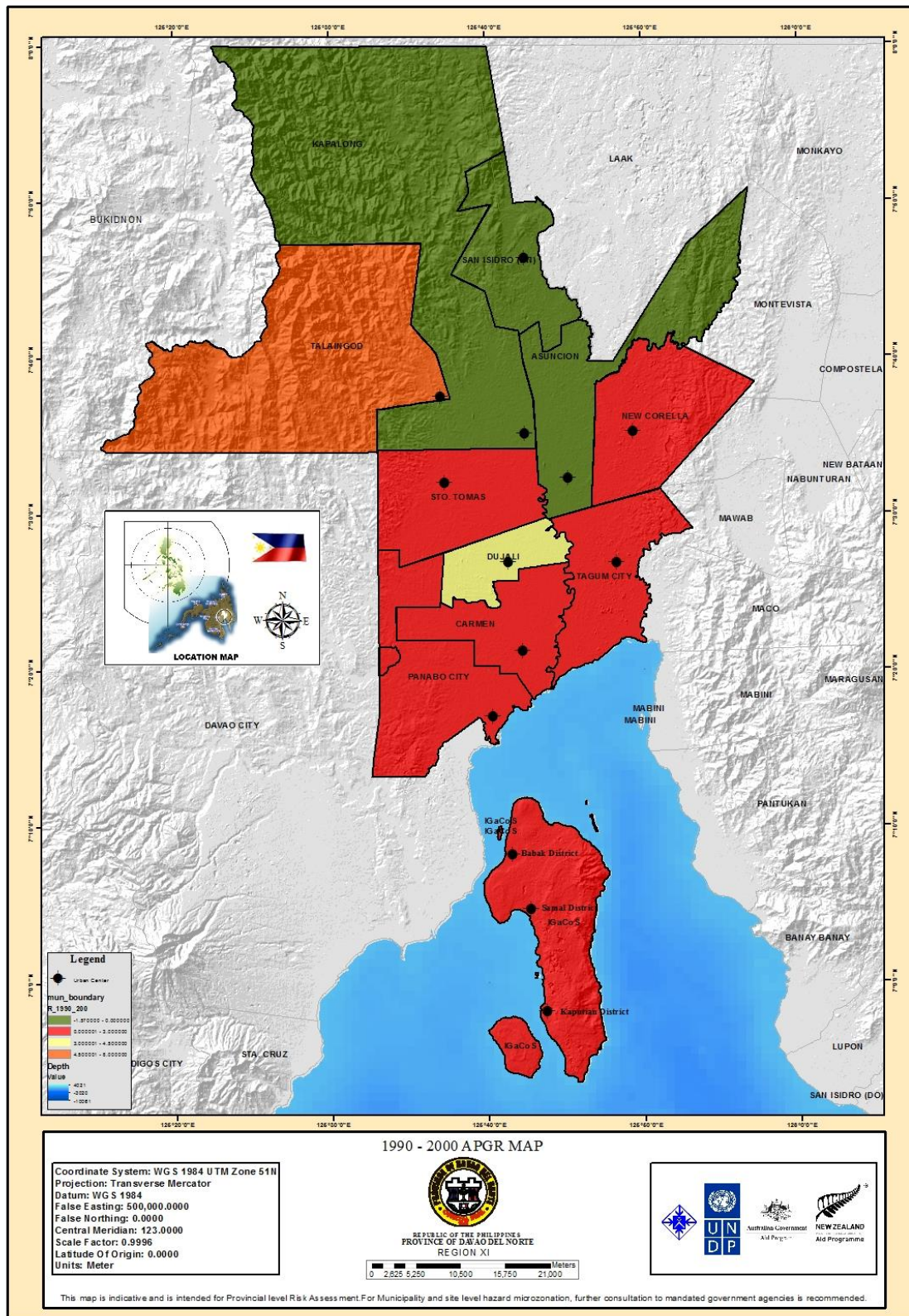
**Table No. 3-6: Projected Male Household Population, by Age Group : 2011-2022**

Age Group	2007	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All Ages	433,356	480,932	499,794	519,562	540,289	562,029	584,841	608,787	633,933	660,350	688,113	717,304	748,009	780,320
Under 1	10,112	10,474	10,609	10,745	10,884	11,024	11,166	11,309	11,455	11,602	11,752	11,903	12,056	12,212
0-4	41,458	45,048	46,429	47,853	49,320	50,832	52,390	53,997	55,652	57,359	59,117	60,930	62,798	64,723
5-9	49,253	53,594	55,266	56,990	58,767	60,600	62,490	64,440	66,450	68,522	70,660	72,864	75,136	77,480
10-14	48,084	50,483	51,385	52,303	53,237	54,188	55,156	56,141	57,144	58,164	59,203	60,261	61,337	62,433
15-19	48,199	50,253	51,021	51,802	52,594	53,398	54,214	55,043	55,885	56,740	57,607	58,488	59,382	60,290
20-24	40,859	46,715	49,047	51,494	54,065	56,763	59,596	62,571	65,693	68,972	72,415	76,029	79,824	83,808
25-29	35,599	39,814	41,467	43,190	44,983	46,852	48,797	50,824	52,935	55,133	57,423	59,808	62,291	64,878
30-34	30,824	36,039	38,147	40,378	42,739	45,239	47,885	50,685	53,650	56,787	60,109	63,624	67,345	71,284
35-39	28,058	31,015	32,166	33,359	34,597	35,881	37,213	38,593	40,026	41,511	43,051	44,649	46,305	48,024
40-44	24,074	27,821	29,324	30,907	32,577	34,336	36,191	38,146	40,206	42,377	44,666	47,079	49,622	52,302
45-49	21,530	24,019	24,994	26,008	27,064	28,162	29,305	30,494	31,732	33,019	34,359	35,754	37,205	38,715
50-54	18,183	20,886	21,966	23,101	24,295	25,551	26,871	28,260	29,721	31,257	32,873	34,572	36,359	38,239
55-59	13,206	16,321	17,628	19,039	20,563	22,209	23,987	25,907	27,981	30,221	32,641	35,254	38,076	41,124
60-64	8,481	11,034	12,142	13,361	14,703	16,180	17,804	19,592	21,560	23,725	26,107	28,729	31,614	34,788
65-69	6,490	6,986	7,176	7,370	7,570	7,776	7,987	8,204	8,426	8,655	8,890	9,131	9,379	9,634
70-74	4,284	5,027	5,328	5,647	5,985	6,344	6,724	7,126	7,553	8,005	8,485	8,993	9,531	10,102
75-79	2,487	2,889	3,051	3,222	3,402	3,593	3,794	4,006	4,230	4,467	4,717	4,982	5,261	5,555
80 & over	2,175	2,514	2,650	2,793	2,944	3,104	3,271	3,448	3,635	3,831	4,039	4,257	4,487	4,730

**Table No. 3-7: Projected Female Household Population, by Age Group : 2011-2022**

Age Group	2007	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
All Ages	409,688	456,853	475,678	495,483	516,332	531,468	554,129	578,029	603,252	629,885	653,562	683,572	715,313	748,905
Under 1	9,282	9,823	10,027	10,236	10,449	10,667	10,889	11,115	11,347	11,583	11,824	12,070	12,321	12,578
0-4	38,897	42,240	43,526	44,850	46,215	47,622	48,613	49,625	50,658	51,712	53,286	54,908	56,579	58,301
5-9	46,163	49,495	50,765	52,068	53,405	54,776	56,181	57,623	59,102	60,619	62,175	63,771	65,408	67,087
10-14	45,264	47,524	48,374	49,238	50,118	51,014	51,926	52,854	53,799	54,761	55,740	56,736	57,750	58,782
15-19	47,130	49,266	50,067	50,880	51,707	52,547	53,401	54,268	55,150	56,046	56,957	57,882	58,823	59,779
20-24	38,583	44,718	47,183	49,784	52,528	55,424	58,479	61,703	65,105	68,693	72,480	76,476	80,692	85,140
25-29	32,775	37,176	38,919	40,744	42,654	44,653	46,747	48,939	51,233	53,635	56,150	58,782	61,538	64,423
30-34	28,751	33,301	35,128	37,056	39,090	41,235	43,498	45,885	48,403	51,059	53,861	56,816	59,934	63,223
35-39	26,273	29,104	30,207	31,353	32,541	33,775	35,056	36,385	37,764	39,196	40,682	42,224	43,825	45,487
40-44	22,662	26,163	27,566	29,044	30,602	32,243	33,972	35,794	37,713	39,736	41,867	44,112	46,478	48,970
45-49	20,453	22,921	23,890	24,901	25,954	27,052	28,196	29,389	30,632	31,928	33,278	34,686	36,153	37,682
50-54	17,049	19,822	20,939	22,118	23,364	24,680	26,070	27,539	29,090	30,729	32,460	34,288	36,219	38,260
55-59	12,231	15,598	17,040	18,615	20,337	22,217	24,271	26,515	28,966	31,644	34,569	37,765	41,257	45,071
60-64	7,885	10,458	11,589	12,842	14,231	15,770	17,476	19,366	21,461	23,782	26,354	29,204	32,362	35,862
65-69	6,343	7,163	7,487	7,825	8,179	8,549	8,935	9,339	9,761	10,202	10,663	11,145	11,649	12,176
70-74	4,572	5,574	5,990	6,438	6,919	7,436	7,992	8,589	9,231	9,920	10,662	11,458	12,314	13,234
75-79	2,650	3,372	3,681	4,018	4,386	4,787	5,226	5,704	6,227	6,797	7,419	8,098	8,840	9,650
80 & over	2,725	3,135	3,299	3,471	3,653	3,844	4,045	4,256	4,479	4,713	4,960	5,219	5,492	5,779

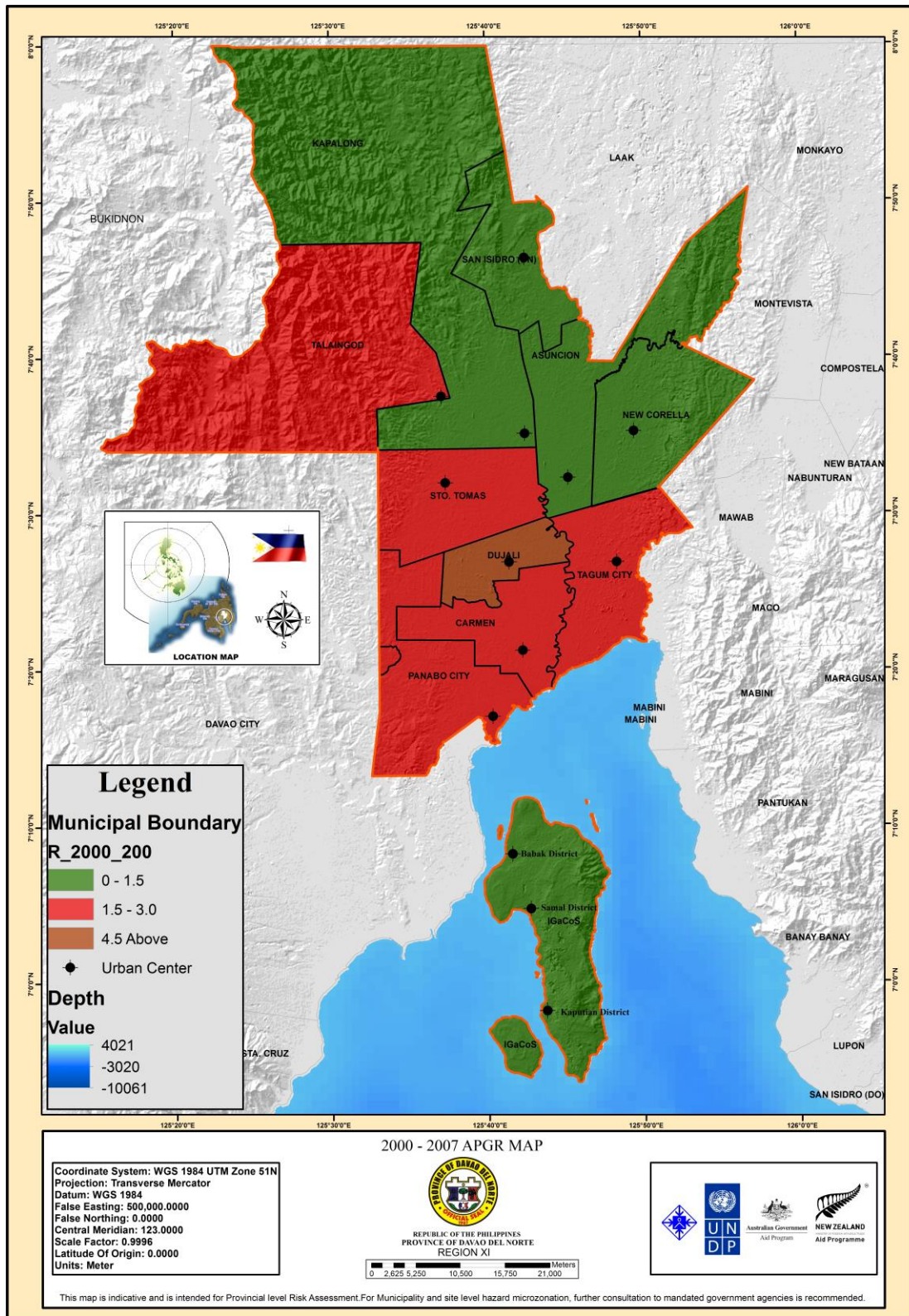
**Map 6: 1990- 2000 ANNUAL POPULATION GROWTH RATES**



Source: GIS Division, PPDO



**Map 7: 2000-2007 ANNUAL POPULATION GROWTH RATES**



Source: GIS Division, PPDO

## 2.2 Existing settlement pattern

A histogram illustrates the hierarchy of settlements in the cities and municipalities in the province. From the seven level/categories in the urban hierarchy, only the following four levels apply for classifying the settlements in the province both for census year 2010 and the planning period 2013: a) Small/Medium City (Primary Urban Center A), with an urban population of more than 100,000; b) Large Town (Primary Urban Center B) with an urban population of more than 50,000; c) Medium Town (Secondary Urban Center A) with an urban population of more than 25,000; and d) Small Town (Secondary Urban Center B) with an urban population of more than 2,500.

Based on the 2010 population, urban cities are categorized as follows: Tagum City as a Small/Medium City; Panabo City as Large Town; c) the Island Garden City of Samal and the Municipality of Sto. Tomas as Medium Towns, while the municipalities of Asuncion, Braulio E. Dujali, Carmen, Maniki, New Corella and Talaingod have urban populations of more than 2,500, thus classified as small towns.

Tagum City is just 55 kilometers from Davao City and 1 hour travel by bus to and from Davao City. It positions itself as a major distribution center for commerce and trade in the province and neighboring areas. In recent years, the spatial expansion in terms of development and population took place at a faster pace, extending to neighboring barangays. Facilities and services have become more accessible such as complete levels of education, sports and recreation, transportation and communication, hospitals and clinics, churches, shopping malls and public market. Tagum City as the big brother of cluster 1, is joined by the municipalities of New Corella, Asuncion and San Isidro.

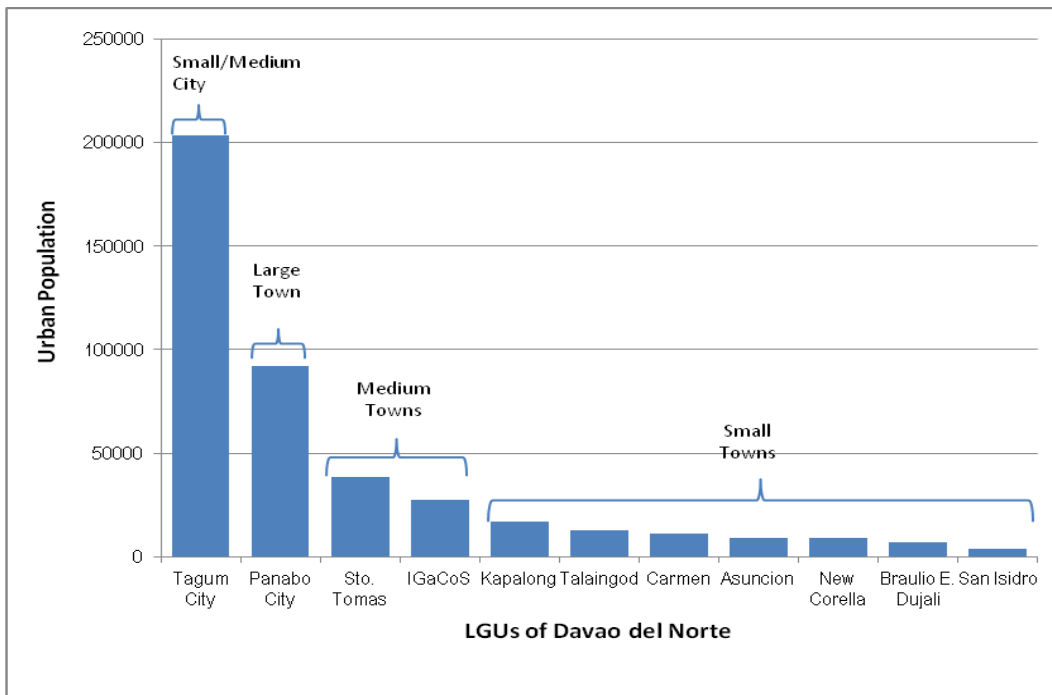
Panabo City is only 23 kilometers away from Tagum City, and is just 30 minutes travel by bus from Tagum City and 35 minutes travel to Davao City. Because of this, Panabo City has become a preferred residential area for those working in Davao City. Aside from this, urban population had increased due to the employment opportunities in the banana industry, which Panabo City provides. The city is also deemed as an alternate site for industrial development in the province because of its seaport facilities. It leads the municipalities of Braulio E. Dujali and Carmen in Cluster 3.

The Island Garden City of Samal is named the tourism capital of the province because of its panoramic residential sites, wide and alluring beaches that attract both foreign and local tourists. It is an island getaway from air pollution brought about by industrialization, and noise pollution caused by buses and jeepneys. The promising tourism industry is seen to develop the island as an idyllic settlement and vacation area.

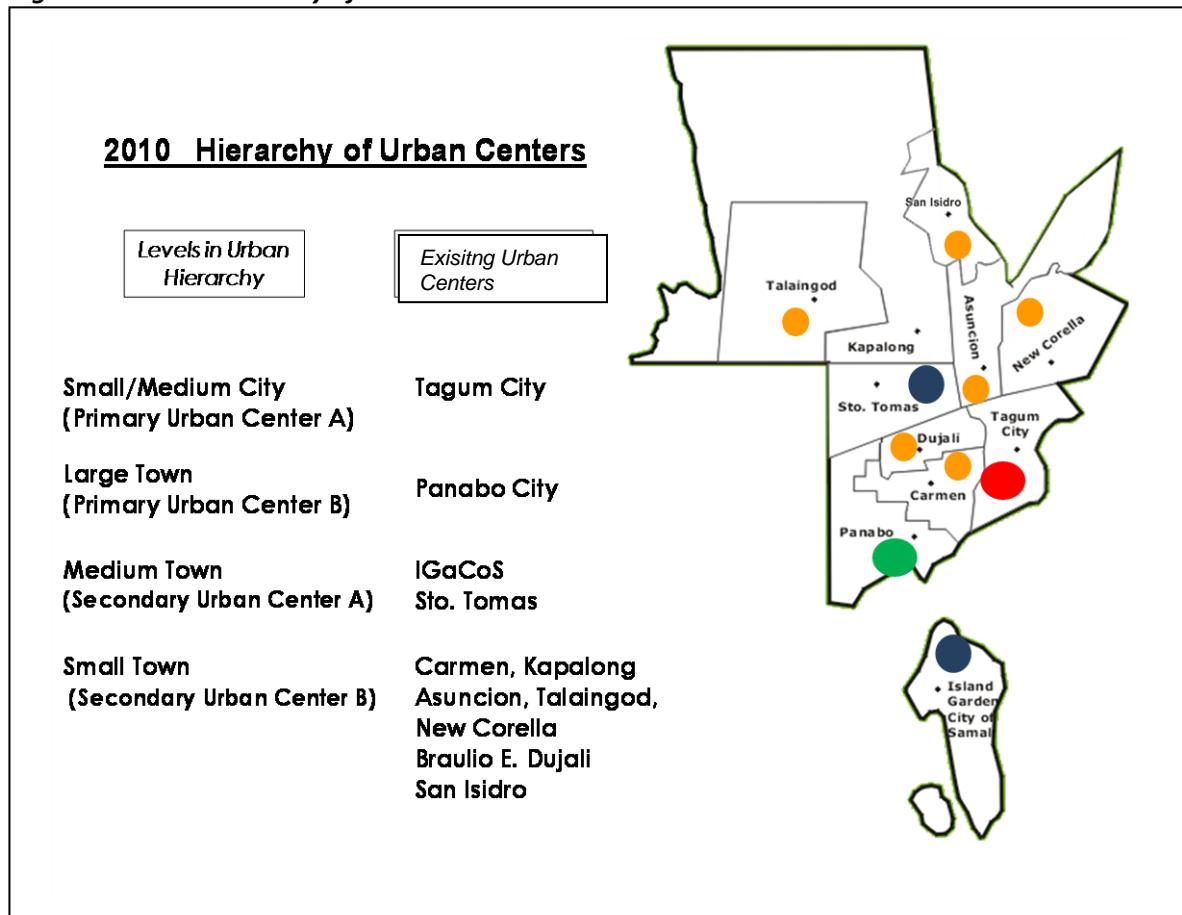
On the other hand, the Municipality of Sto. Tomas is a boon area because of its vast agricultural land devoted to rice and export banana production. Thus, a come on for employment seekers who eventually choose to settle there.

The other municipalities include Asuncion, Braulio E. Dujali, Carmen, Kapalong, New Corella, San Isidro and Talaingod take up the role of small agri-processing and services providing limited entertainment, convenience shops and extension services to their respective populations.

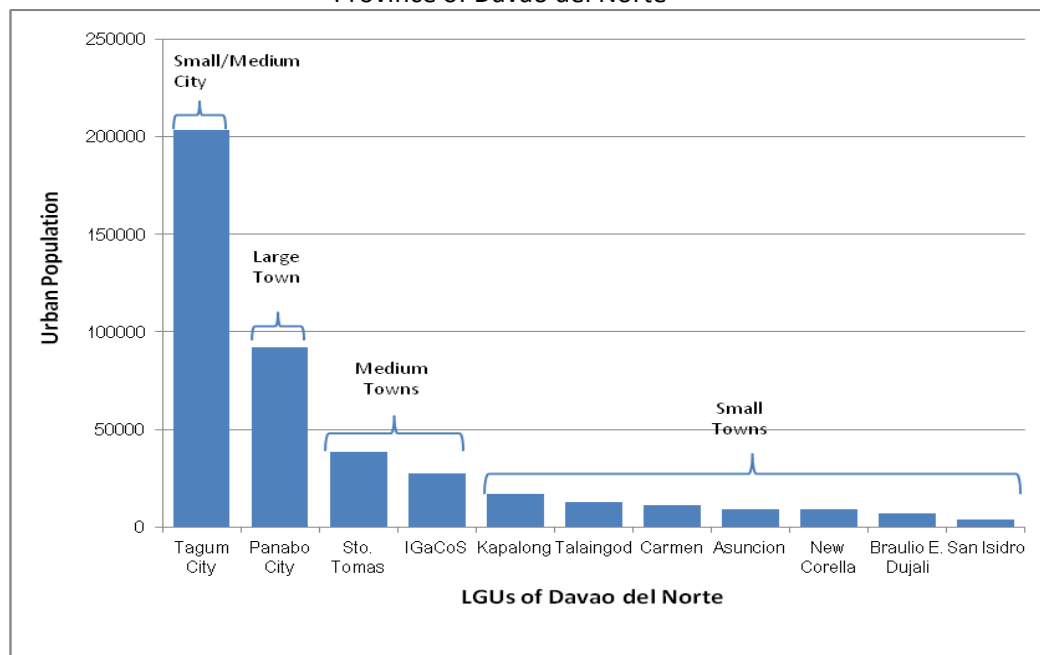
**Figure 1: 2010 Urban Center Population of Cities and Municipalities  
Province of Davao del Norte**



**Figure 2. 2010 Hierarchy of Urban Centers**

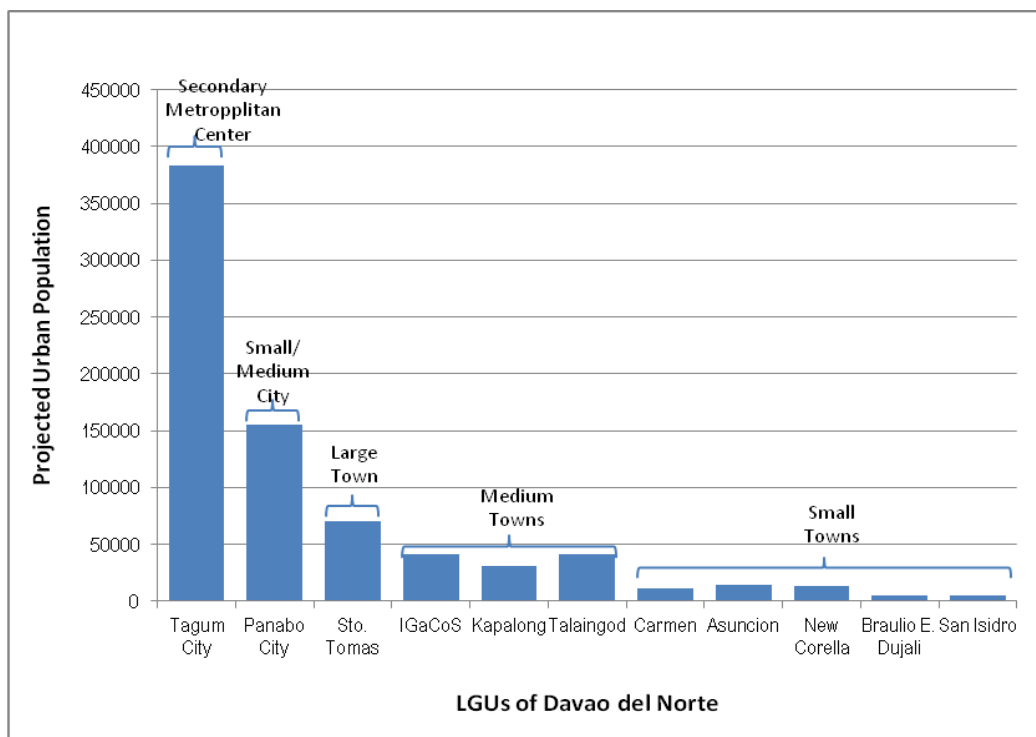


**Figure 3 : 2013 Urban Population of Cities and Municipalities  
Province of Davao del Norte**



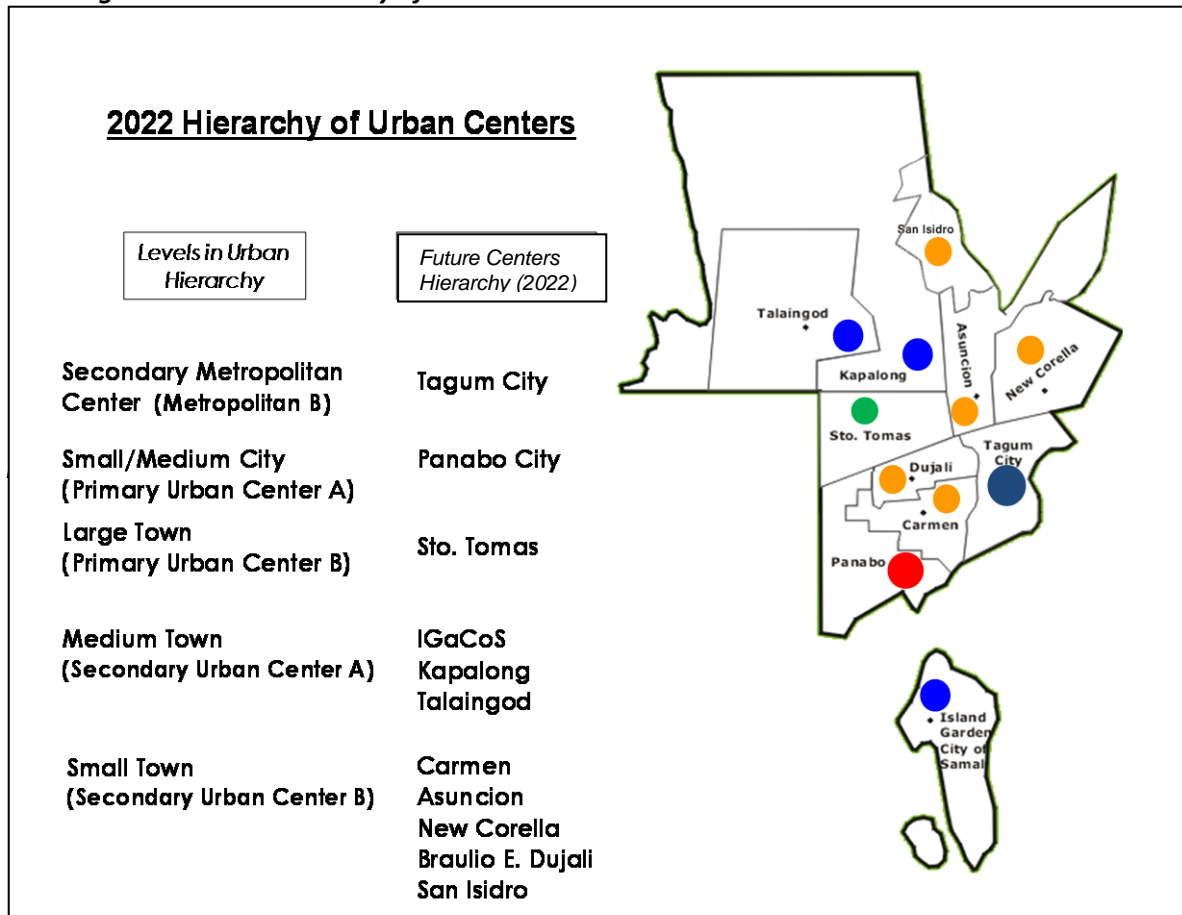
Comparing the hierarchy of urban population of 2010 and 2013, the increase in urban populations of cities and municipalities in the province had not affected their positions in the hierarchy. Hence, their levels are the same between 2010 and 2013. However, it is expected that by the end of the plan period, which is 2022, the increase in urban populations will cause a progression of most LGUs to a higher level such that Tagum City will eventually become a Secondary Metropolitan Center. Likewise, Panabo City will become a Small/Medium City while the Municipality of Sto. Tomas will step into Large Town Category. On the other hand, the Island Garden City of Samal together with the municipalities of Kapalong will become Medium Towns. From 7 Small towns, 5 municipalities will maintain their position as Small Towns. (Please see the hierarchy below)

**Figure 4. 2022 Projected Population in Urban Centers of Davao del Norte**

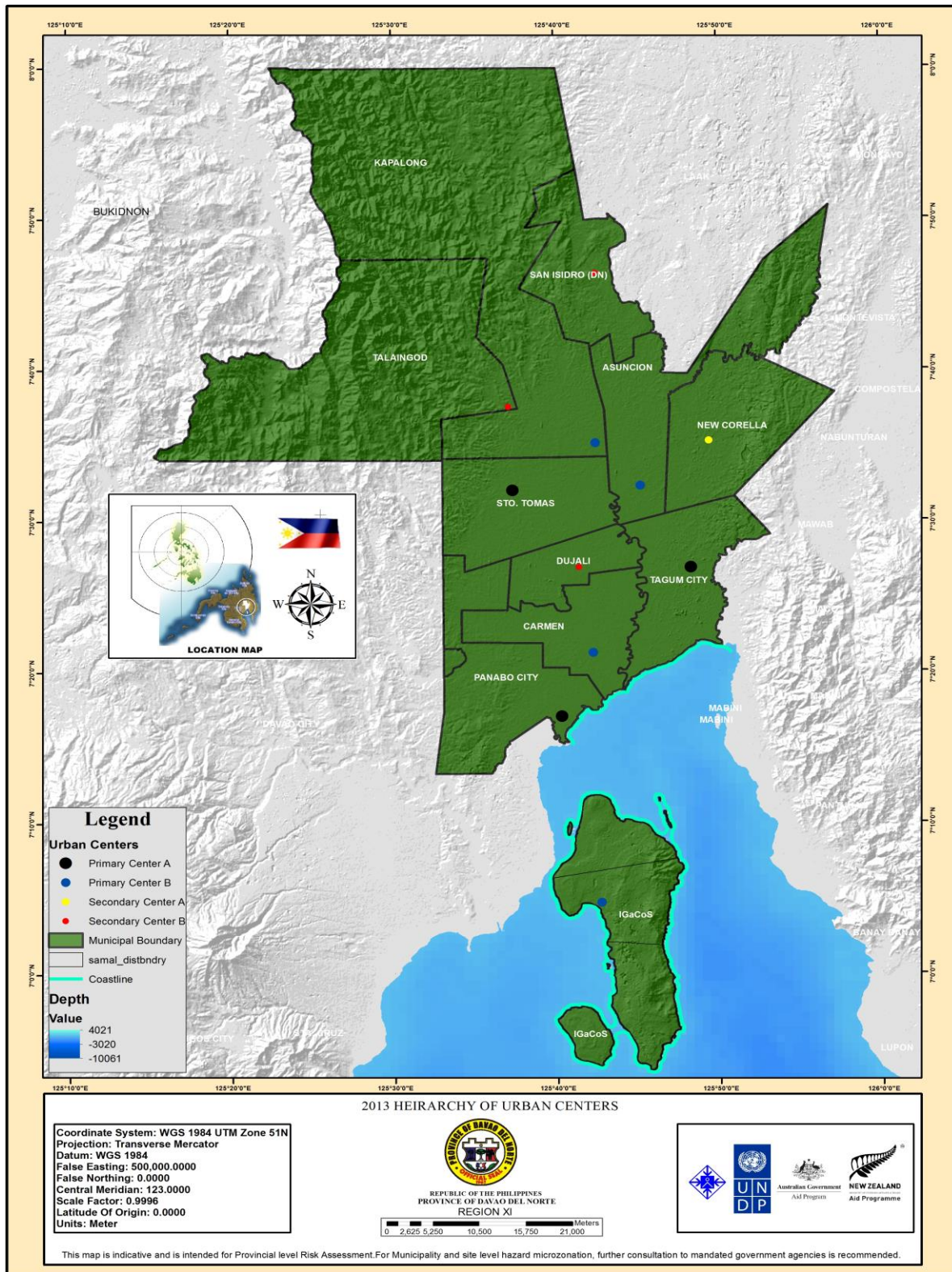




**Figure 5. 2022 Hierarchy of Urban Centers**



**Map 8: 2013 HEIRARCHY OF URBAN CENTERS**



Source: GIS Division, PPDO



	family planning	plant ind. & NGA	soc. work, forestry	civic groups	professional org.	cooperatives	credit groups	labor unions	women's club	youth club	kinder/nursery sch	primary/interm. sch	sec./voc. schools	colleges/univ/tech	physicians/nurses	midwives/dentist	healers/herbalist	optometrist	lawyers/engineers	accountants/arch'ts teachers/electrician s	barbers /parlors	tailor/dressmaker	shoe repair shop	photo studio	funeral parlor	lodging places	restaurants	
Tagum City																												
New Corella																												
Asuncion																												
Sto. Tomas																												
Kapalong																												
Talaingod																												
Panabo																												
Carmen																												
San Isidro																												
B. Dujali																												
IGC of Samal																												

## 2.3 Population Exposed to Hazards

### 2.3.1 Population Exposure to Flood

With reference to the maps produced on flooding, and by overlaying the population density map and the flood prone map, there are three municipalities with high percentage of the population exposed to flooding. These are the municipalities of B. E. Dujali, a total of 18,957 or 76.18%, Carmen has 49.46% or 30,497 and Asuncion has 13,008 population or 25.64% with high exposure to flooding. On the other hand, the municipalities of Carmen and B.E Dujali lie on the central broad plain of the province where major rivers traverse. Likewise Asuncion is also a low lying municipality traversed by one of the major rivers in the province which is Saug river.

Eventually, there is also population classified under very high susceptibility to flooding, namely B. E. Dujali with 18.04% and Asuncion with 14.57% of populations exposed to flooding.

**Table 3-8. Exposed Population to Flood, Davao del Norte**

City/Mun	Popula- tion 2010	Exposure				Percentage Exposure			
		Very High Suscepti- bility	High Suscepti- bility	Moderate Suscepti- bility	Low Suscepti- bility	Very High Suscepti- bility	High Suscepti- bility	Moderate Suscepti- bility	Low Suscepti- bility
Asuncion	50,731	7,391	13,008	3,298	1,179	14.57%	25.64%	6.50%	2.32%
B.E. Dujali	24,886	4,489	18,957	9,168	1,613	18.04%	76.18%	36.84%	6.48%
Carmen	61,656	2,330	30,497	23,667	20,778	3.78%	49.46%	38.39%	33.70%
Kapalong	61,763	1,597	3,138	2,127	1,180	2.59%	5.08%	3.44%	1.91%
New Corella	46,311	1,889	7,823	5,245	3,271	4.08%	16.89%	11.33%	7.06%
Panabo City	154,329	-	10,890	15,675	62,590	-	7.06%	10.16%	40.56%
San Isidro	24,696	250	292	471	1	1.01%	1.18%	1.91%	.005%
Sto. Tomas	97,210	8,159	17,703	23,871	38,094	8.39%	18.21%	24.56%	39.19%
Tagum City	215,967	9,736	34,990	1,301	758	4.51%	16.20%	0.60%	0.35%
Talaingod	19,600	-	1	1	-	-	0.005%	0.006%	-

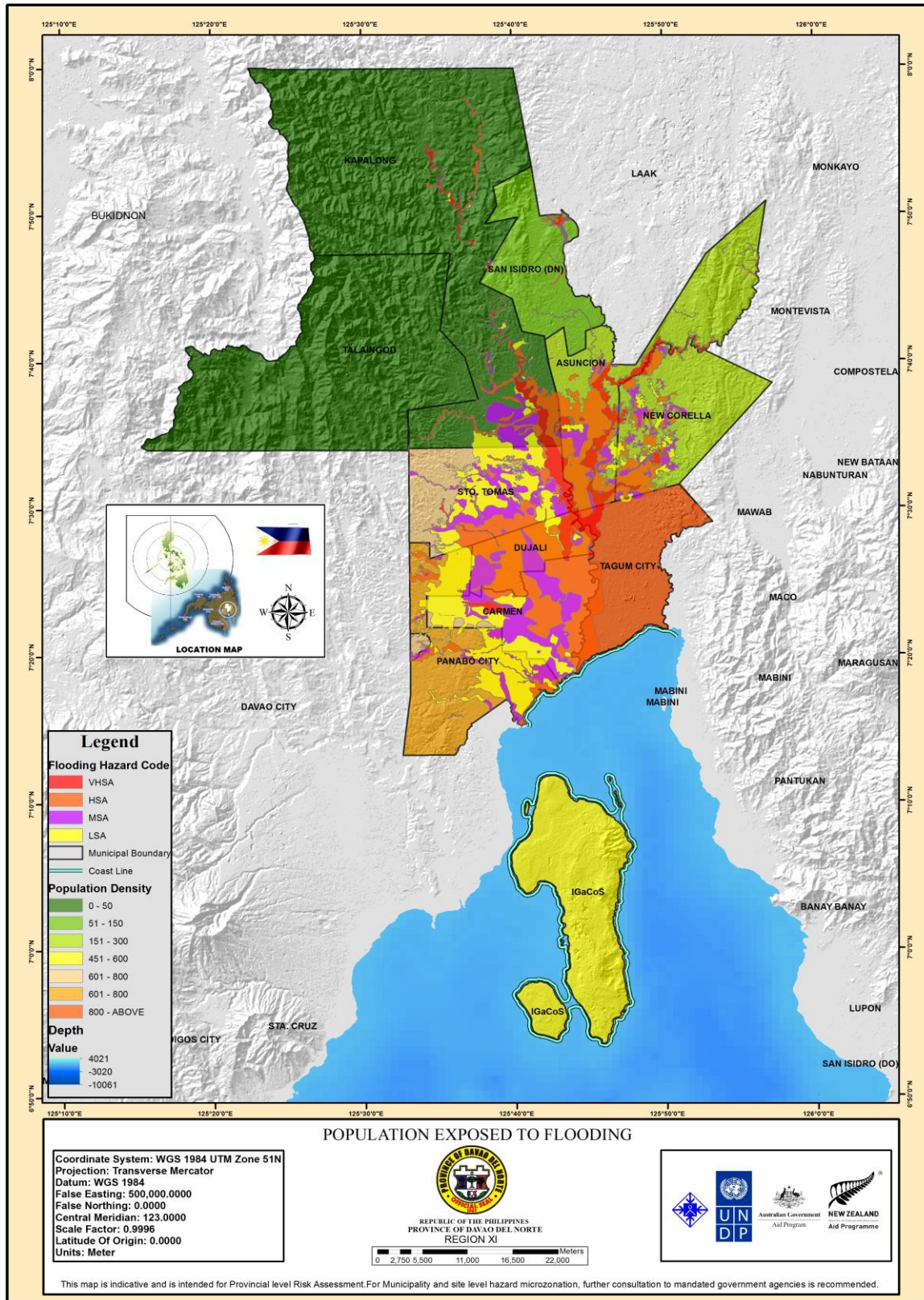
Source: GIS generated data based on the Population Density and Flood Prone Maps

### 2.3.2 Population exposed to rain-induced landslide

The population exposed to rain-induced landslide is presented in Table 3-9. A total of 60,237 are classified to high susceptibility, and at risk to rain-induced landslide, 60,012 are moderately susceptible and 231,813 belonged to low susceptibility.



**Map 9. Population Exposed to Flooding**



Source: GIS Division, PPDO

The municipality of Kapalong has the most number of populations with 29,346 that are highly susceptible to rain-induced landslide. It is followed by the municipality of Talaingod with 18,854 populations exposed to highly susceptible areas. These two municipalities have the largest upland areas in the province.

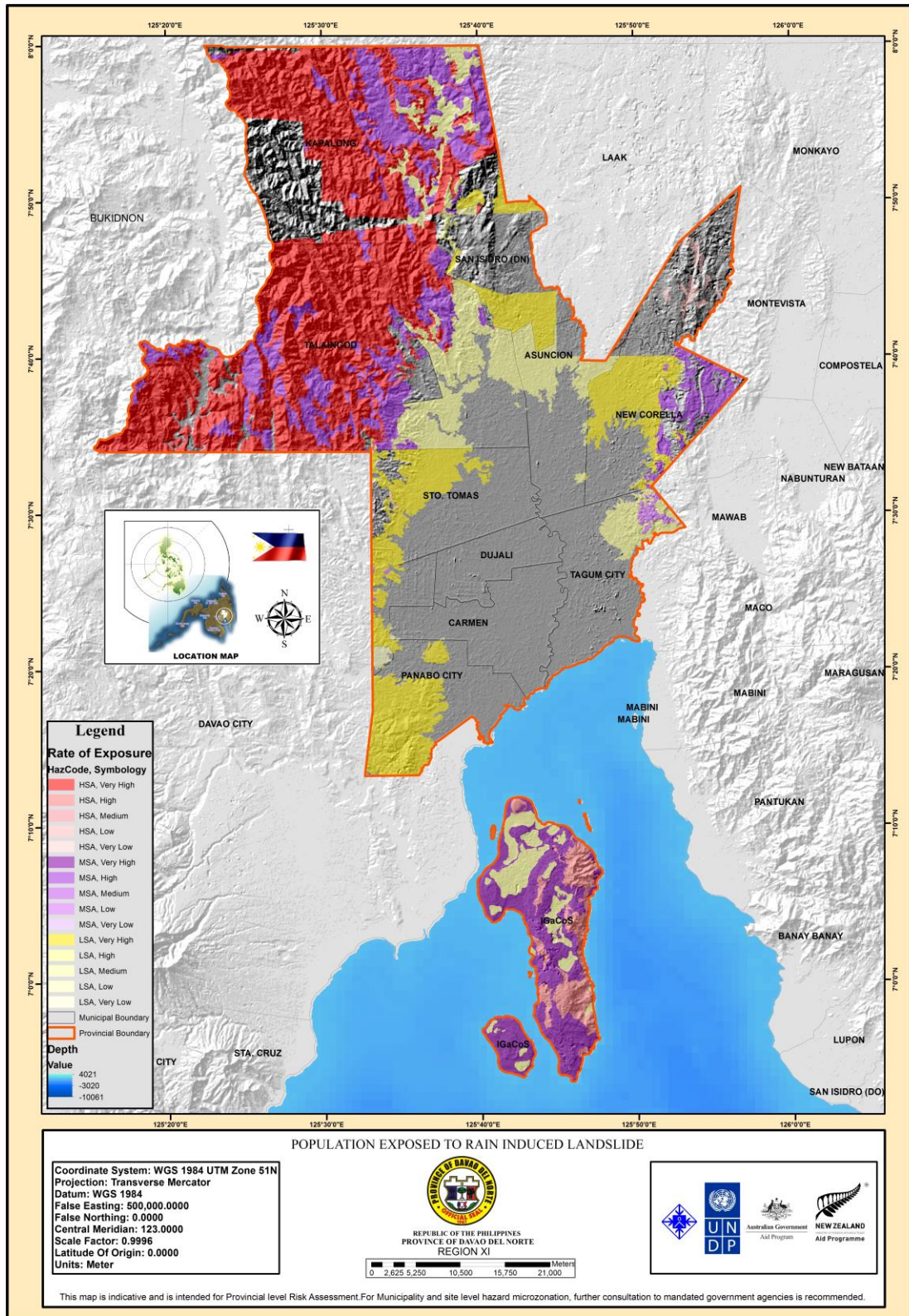
**Table 3-9. Population Exposed to Rain-Induced Landslide**  
Province of Davao del Norte: CY 2013

City/ Municipality	Population	Population Exposure within the HSA	Population Exposure within the MSA	Population Exposure within the LSA	Exposure percentage of population within the HSA	Exposure percentage of population within the MSA	Exposure percentage of population within the LSA
Asuncion	55,844	2,594	7,893	24,866	5%	14%	45%
Carmen	69,199			2,320			3%
Kapalong	68,261	29,346	12,950	12,308	43%	19%	18%
New Corella	50,699	6,543	10,094	20,827	13%	20%	40%
San Isidro	25,548	1,628	1,459	9,661	6%	6%	38%
Sto. Tomas	109,269	571	11,086	35,925	1%	10%	33%
Talaingod	25,566	18,854	5,231	1,501	74%	20%	6%
IGaCoS	95,874		58,067	21,429		55%	20%
Panabo City	174,364		734	82,976		0.4%	48%
Tagum City	242,801	701	10,565	41,429	0.2%	4%	17%
<b>Total</b>	<b>945,764</b>	<b>60,237</b>	<b>60,012</b>	<b>231,813</b>	<b>20.3%</b>	<b>11.7%</b>	<b>27.6%</b>

*Source: GIS generated data based on the MGB map*



**Map 10. Population Exposed to Rain-Induced Landslide**



Source: GIS Division, PPDO



### 2.3.3 Population exposed to earthquake induced landslide

Using the simulation parameters located on the Central Mindanao Fault with a magnitude of 7.2 with a depth of 2 km., with the epicenter located at 125.75 longitude and 7.53<sup>0</sup> latitude using the site amplification assumption and wet season, ground shaking data/map is generated. The process generated information on areas that are prone to ground shaking and earthquake induced landslides.

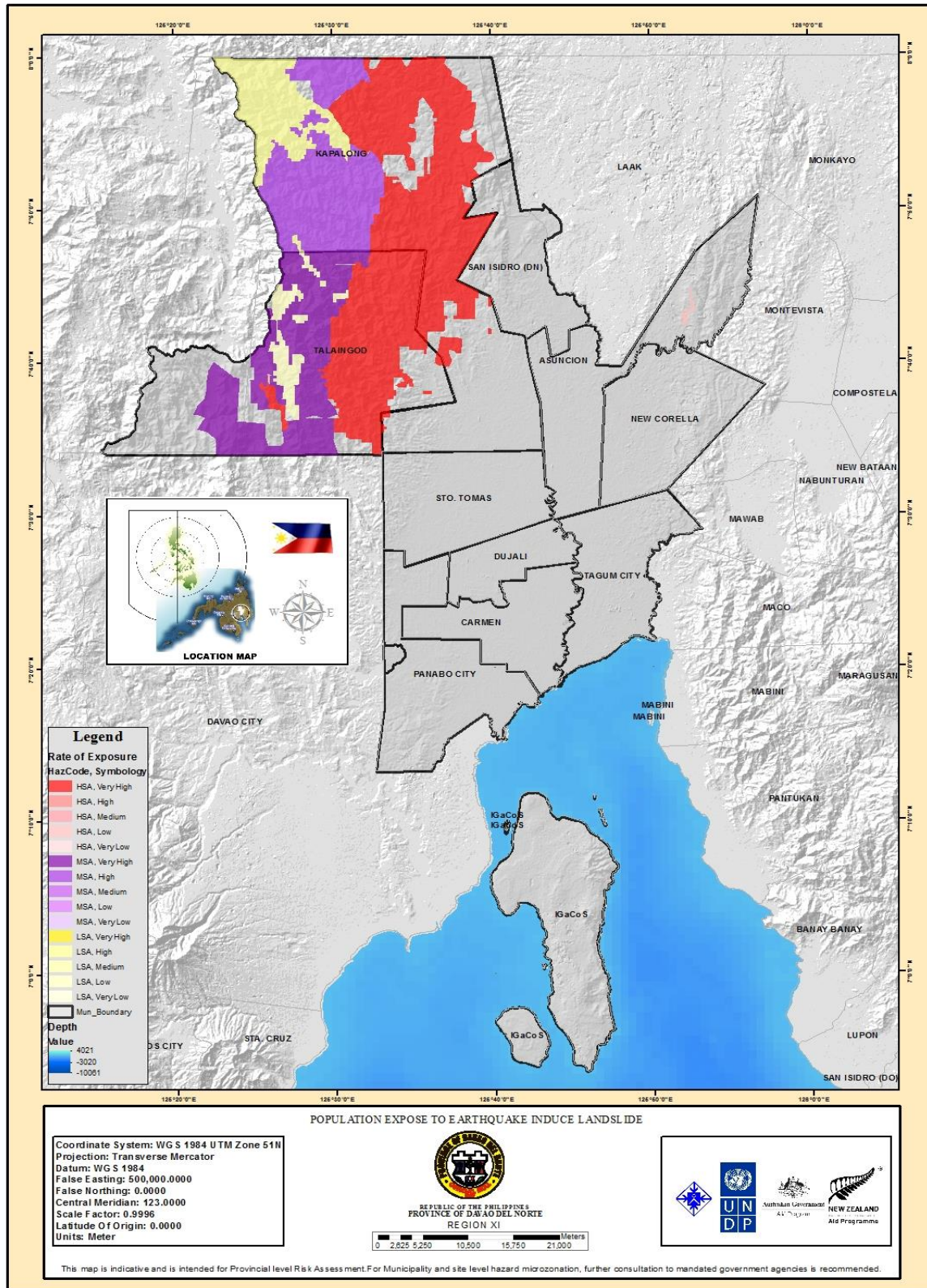
The municipalities of Kapalong and Talaingod have most of its population exposed to EIL under the high susceptible category with 27,848 and 11,784 respectively. The majority of the area of these two municipalities is categorized as forestland or upland having a slope of 18 percent and above and an elevation of above 18%. In the same manner, populations exposed to EIL under the moderate and low susceptible category are from these two municipalities also.

**Table 3-10. Population exposed to Earthquake Induced Landslide (EIL)**  
Province of Davao del Norte: 2013

Municipality	Municipal Population	Exposed Population in High Susceptible Area	Exposed Population in Moderate Susceptible Area	Exposed Population in Low Susceptible Area	Population Exposure Percentage in High Susceptible Areas	Population Exposure Percentage in Moderate Susceptible Areas	Population Exposure Percentage in Low Susceptible Areas
Asuncion	64,215	572	-	-	.8%	-	-
BE Dujali	34,234	-	-	-	-	-	-
Carmen	81,848	-	-	-	-	-	-
IGaCoS	104,617	-	-	5,418	-	-	5%
Kapalong	78,952	27,848	16,900	8,841	35%	21%	11%
New Corella	57,834	5,804	-	-	10%	-	-
Panabo City	208,239	-	-	-	-	-	-
San Isidro	26,840	8,441	-	-	31%	-	-
Sto. Tomas	129,529	-	-	-	-	-	-
Tagum City	287,894	-	-	-	-	-	-
Talaingod	37,629	11,784	12,580	2,143	31%	33%	5%

Source: GIS generated data based on the MGB map

**Map 11. Population Exposed to Earthquake Induced Landslide**



Source: GIS Division, PPDO

### 3.4 Population Exposed to Ground Shaking

The table below indicates that all of the municipalities and cities in the province, except Panabo City are prone or exposed to ground shaking. Tagum City, Sto. Tomas and the Island Garden City of Samal are the three LGUs with a large number of populations that will be affected by this hazard. The data on this hazard is generated thru an earthquake simulation scenario of the Central Mindanao Fault with an earthquake magnitude of 7.2.

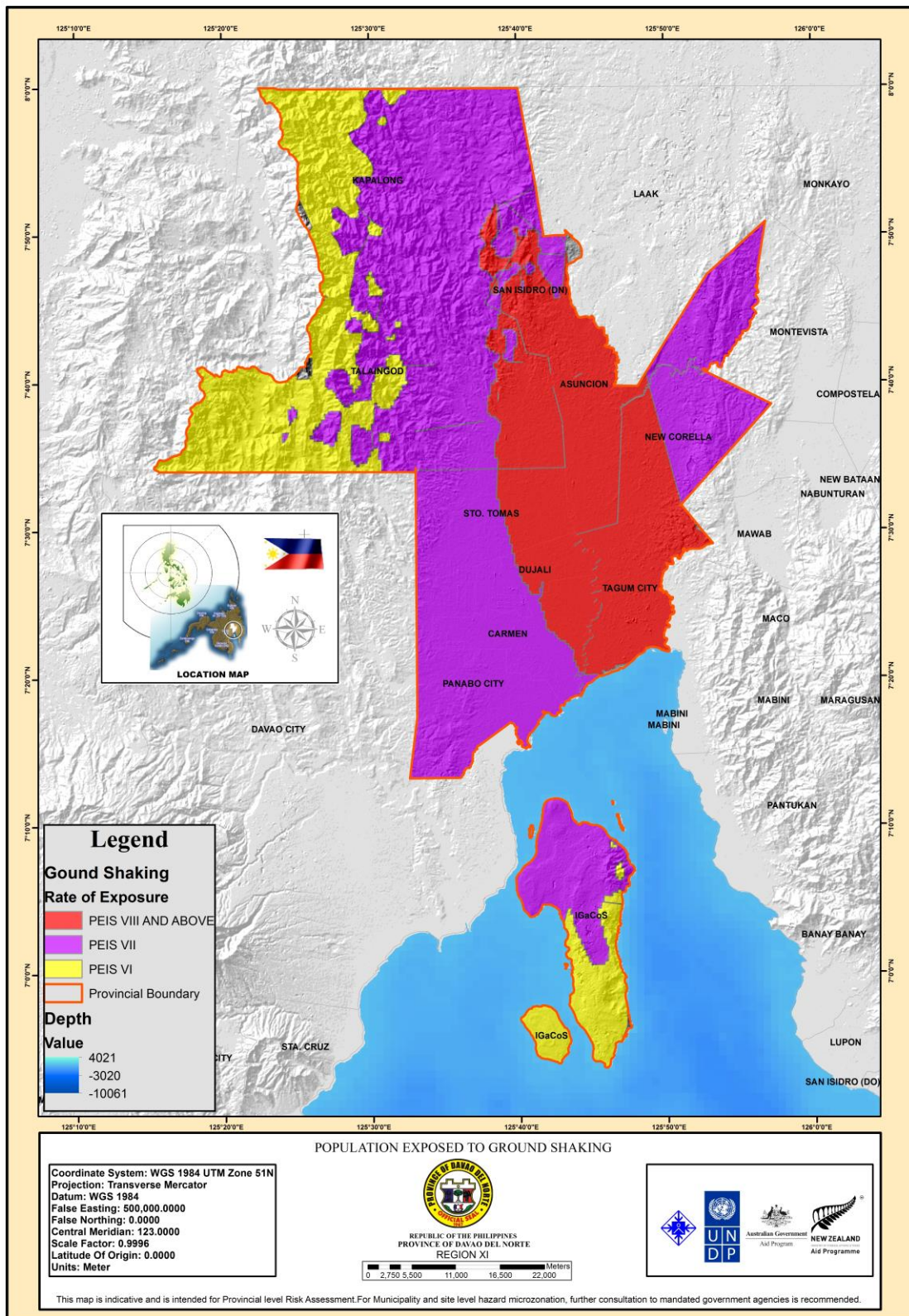
**Table 3-11. Populations Exposed to Ground Shaking**

City/ Municipality	Population	Population Density per sq. km.	Area Affected	Exposed Population in Prone Areas
Asuncion	64,215	229	5,860.018	36,374
B.E Dujali	34,234	386	5,211.429	20,130
Carmen	81,848	490	6,409.683	31,437
IGACOS	104,617	373	12,496.465	46,628
Kapalong	78,952	87	29,387.243	25,554
New Corella	57,834	256	9,075.182	23,232
Panabo City	208,239	853	-	-
San Isidro	26,840	160	10,952.514	17,469
Sto. Tomas	129,529	601	10,330.832	62,054
Tagum City	287,894	1,484	18,346.652	272,321
Talaingod	37,629	61	26,012.569	15,883
Davao del Norte				551,082

Source: GIS generated data based on the PHIVOLCS map

*Map 12. Population Exposed to Ground Shaking*





Source: GIS Division, PPDO

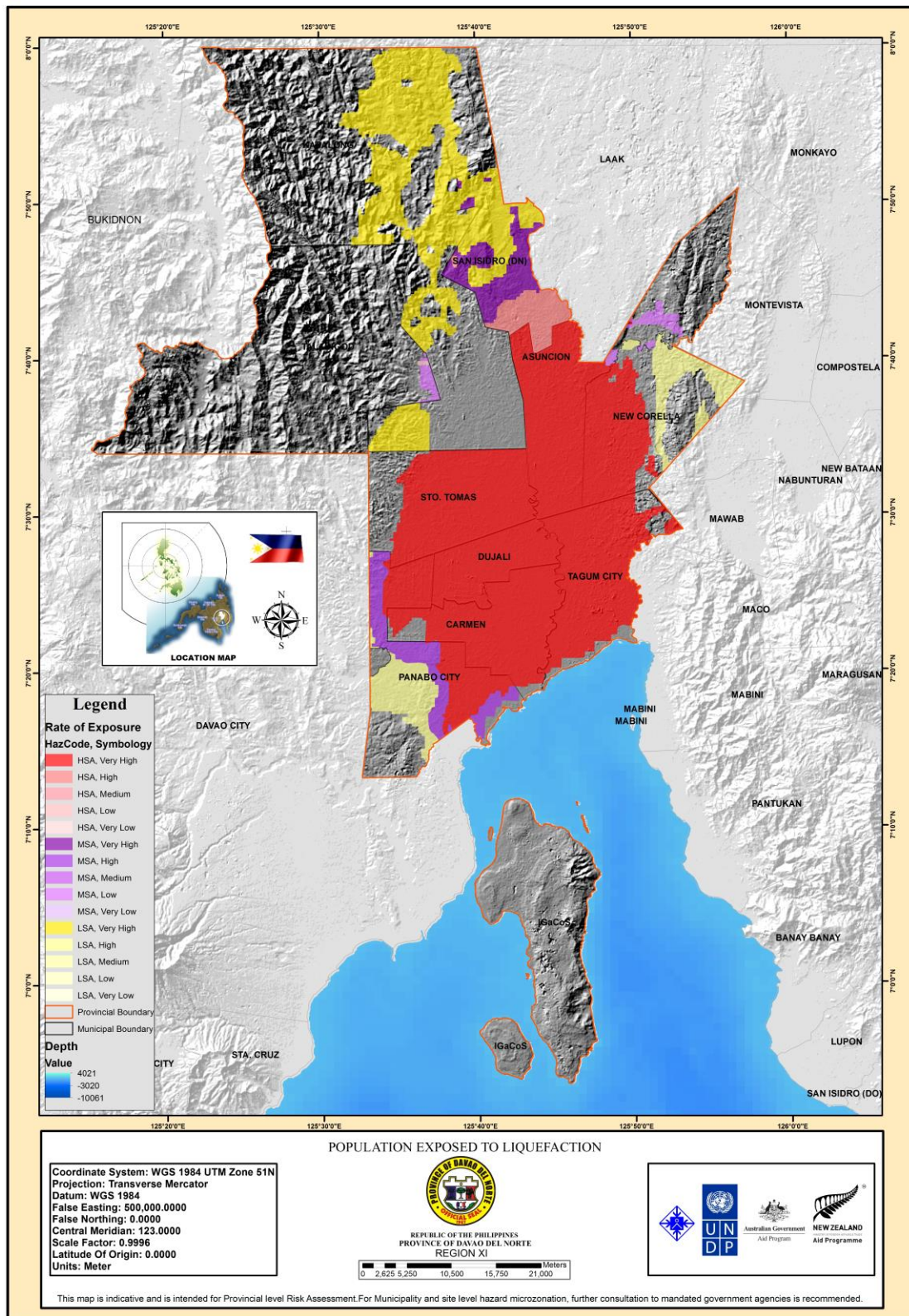
**Table 3-12. Population Exposed to Liquefaction**

Municipal Name	Area in Ha	Population Density	Population Exposed within high susceptible area	Population Exposed within Moderate susceptible area	Population Exposed within low susceptible area	Percentage of population exposed within the high susceptible area	Percentage of population exposed within the moderate susceptible area	Percentage of population exposed within the low susceptible area
ASUNCION	27,999.199	2.293	36,822.704	3,089.045	6,506.591	57.34%	4.81%	10.13%
B.E.DUJALI	8,862.890	3.863	34,233.967	0.000	0.000	100.00%	0.00%	0.00%
CARMEN	16,688.100	4.905	72,740.092	5,044.413	2,880.635	88.87%	6.16%	3.52%
ISLAND GARDEN CITY OF SAMAL	28,037.699	3.731	0.000	0.000	0.000	0.00%	0.00%	0.00%
KAPALONG	90,795.102	0.870	10,740.089	8,290.536	23,879.925	13.60%	10.50%	30.25%
NEW CORELLA	22,592.100	2.560	27,098.859	8,354.527	12,846.368	46.86%	14.45%	22.21%
PANABO	24,401.600	8.534	66,465.378	50,280.121	45,210.264	31.92%	24.15%	21.71%
SAN ISIDRO	16,827.600	1.595	6,497.359	9,021.304	10,473.209	24.21%	33.61%	39.02%
STO. TOMAS	21,564.100	6.007	101,457.061	10,202.589	16,922.518	78.33%	7.88%	13.06%
TAGUM	19,395.801	14.843	253,619.115	17,627.012	0.000	88.09%	6.12%	0.00%
TALAINGOD	61,625.801	0.611	40.317	402.163	3,867.580	0.11%	1.07%	10.28%
DAVAO DEL NORTE	338,789.992	49.811	609,714.941	112,311.710	122,587.090	32.05%	8.93%	16.80%

Source: GIS generated data based on the MGB map

**Map 13. Population Exposed to Liquefaction**





Source: GIS Division, PPDO

### 3.4 Hazard Implications for Population and Settlements

Floods and other hazards impact on both individuals and communities, and have social, economic, and environmental consequences. The consequences of floods and other hazards, both negative and positive, vary greatly depending on the location and extent of the hazards, and the vulnerability and value of the natural and constructed environments they affect.

The flood is the most expensive type of natural hazard that affected Davao del Norte in the past years. The consequences of floods, both negative and positive, vary greatly depending on their location, duration, depth and speed, as well as the vulnerability and value of the affected natural and constructed environments. Floods impact both individuals and communities, and have social, economic, and environmental consequences.

Floods have large social consequences for communities and individuals. As most people are well aware, the immediate impacts of flooding include loss of human life, damage to property, destruction of crops, loss of livestock, and deterioration of health conditions owing to waterborne diseases. As communication links and infrastructure such as power plants, roads and bridges are damaged and disrupted, some economic activities may come to a standstill, people are forced to leave their homes and normal life is disrupted.

Similarly, disruption to industry can lead to loss of livelihoods. Damage to infrastructure also causes long-term impacts, such as disruptions to supplies of clean water, wastewater treatment, electricity, transport, communication, education and health care. Loss of livelihoods, reduction in purchasing power and loss of land value in the floodplains can leave communities economically vulnerable.

Floods can also traumatize victims and their families for long periods of time. The loss of loved ones has deep impacts, especially on children. Displacement from one's home, loss of property and disruption to business and social affairs can cause continuing stress. For some people the psychological impacts can be long lasting. Households whose dwellings will be damaged by the hazards will be rendered homeless. This adds up to the housing backlogs that the LGUs have to address too.

### 3.0 PHYSICAL RESOURCES

#### 3.1 General land and water characteristics and resources

##### 3.1.1 Topography and slope

Rugged, mountainous and moderately to steeply sloping areas on the western part and a wide alluvial plain on the central lowland area generally characterize the topography of the province. Comprising the major portion of the alluvial plain is a flat tract of land. However, some places are gently undulating and exhibit a rolling topography.

Davao del Norte has generally a low land terrain comprising 37 percent of the total land area with less than 100 meters elevation. The highest elevation ranging from 1000-2000 meters comprising 3 percent of the total land area is found in the municipalities of Kapalong and Talaingod.

*Table No.3-13. Elevation Characteristics  
Province of Davao del Norte, 2013*

City/Municipality	Area of Elevation in Hectares						Total
	<100 m	100-300 m	301-500 m	501-1000 m	1001-2000 m	>2001 m	
Davao del Norte	128,343	84,651	29,501	94,174	9,613	-	346,280
% Distribution	37 %	24 %	9 %	27 %	3 %	0.00%	100%

Source: BSWM XI

Slope is a key variable affecting the selection and positioning of crops, and likewise influences the type of management infrastructure that must be adopted to sustain land productivity.

About 53.6 percent of the total land area of the province or 185,687.11 hectares has slope range of 0-18 percent (Table No.3-8). These areas may be used for agriculture, industries and settlements. The remaining 46.4 percent or 160,592.89 hectares of the province are areas with slope ranging from 18 percent to more than 50 percent.

*Table No. 3-14. Slope Classification by City/Municipality  
Province of Davao del Norte (in hectares)*

City/Municipality	Slope Class						Total
	0-3 %	3-8 %	8-18 %	18-30 %	30-50 %	50 % up	
Asuncion	13,530.90	1,799.30	2,601.80	2,652.70	8,758.80	3.50	29,347.00
B.E Dujali	9,100.00	0	0	0	0	0	9,100.00
Carmen	16,603.30	16.50	5.20	0	0	0	16,625.00
Kapalong	10,850.30	5,551.50	5,543.31	25,806.69	19,025.37	27,808.83	94,586.00
New Corella	12,446.30	3,232.80	4,934.90	3,863.80	7,643.80	26.40	32,148.00
San Isidro	4,627.00	1,871.00	939.00	7,716.00	96.00	0	15249.00
Sto. Tomas	13,093.00	3,670.00	2,793.00	9,350.90	2,999.30	134.80	32,041.00
Talaingod	0	1,656.70	2,235.30	14,453.50	7,716.00	19,434.50	45,496.00
IGC of Samal	11,323.10	8,839.10	5,346.80	853.80	1,357.40	350.80	28,071.00
Panabo City	13,023.50	4,210.50	7,589.00	124.50	415.50	0	25,363.00



Tagum City	16,892.30	1,051.00	310.70	0	0	0	18,254.00
Davao del Norte	121,489.70	31,898.40	32,299.01	64,821.89	48,012.17	47,758.83	346,280.00
% Distribution	35.10	9.20	9.30	18.70	13.90	13.80	100

Source: BSWM XI, GIS computations based on the maps by the DENR, BSWM

Note: Land area is not authoritative for any other purposes.

### 3.1.2 Land and water resources

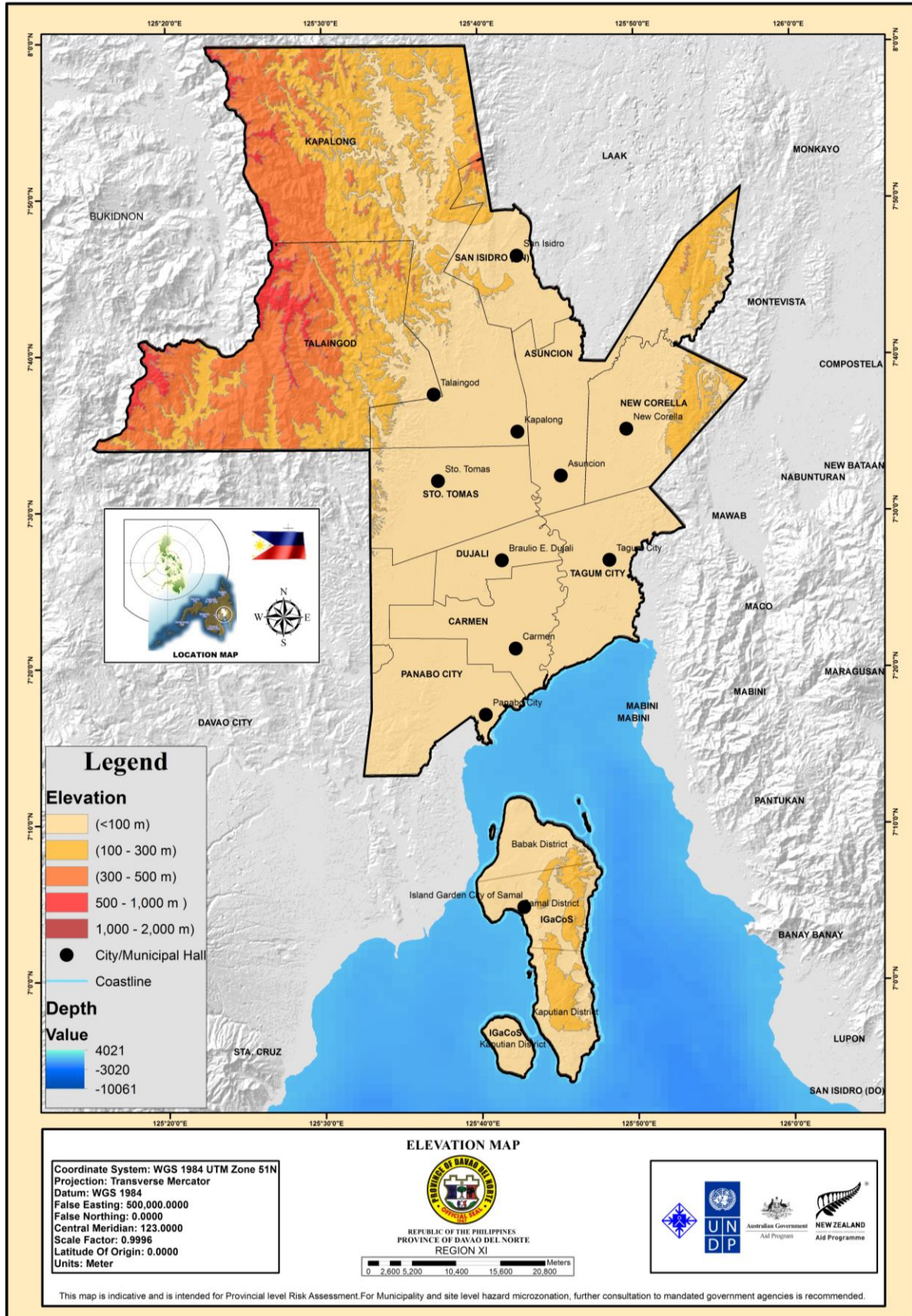
Davao del Norte has a total land area of 346,280 hectares which is 18.3% of the total area of Region XI. About 279,759.50 hectares or 80% of the total land area should be protected for environmental and agriculture development purposes. These are the NIPAS, SAFDZ, marine protected areas and non-NIPAS which include second growth forest with over 1000 meters elevation or 50% slope, mangrove forest, watershed area and buffer strips or easements along rivers and escarpments. The remaining 66,520.50 hectares or 20% can be used for urban and rural settlements, farming, industries, tourism and other urban-related activities.

The province has abundant water supply both from surface and groundwater resources. Fifteen (15) rivers and creeks traverse the province. The bigger rivers such as the Lasang, Tagum/Libuganon, Saug and Tuganay drain the broad plain west and north into Davao Gulf. These major rivers are part of the watersheds of the same name.

Tagum/Libuganon River with a total length of 95 kilometers is the longest among the major rivers in the province and has a total watershed area of 247,500 hectares. It originates from the eastern hillside of the Mindanao Central Cordillera and flows to the central alluvial plain, and then extends to Davao Gulf.

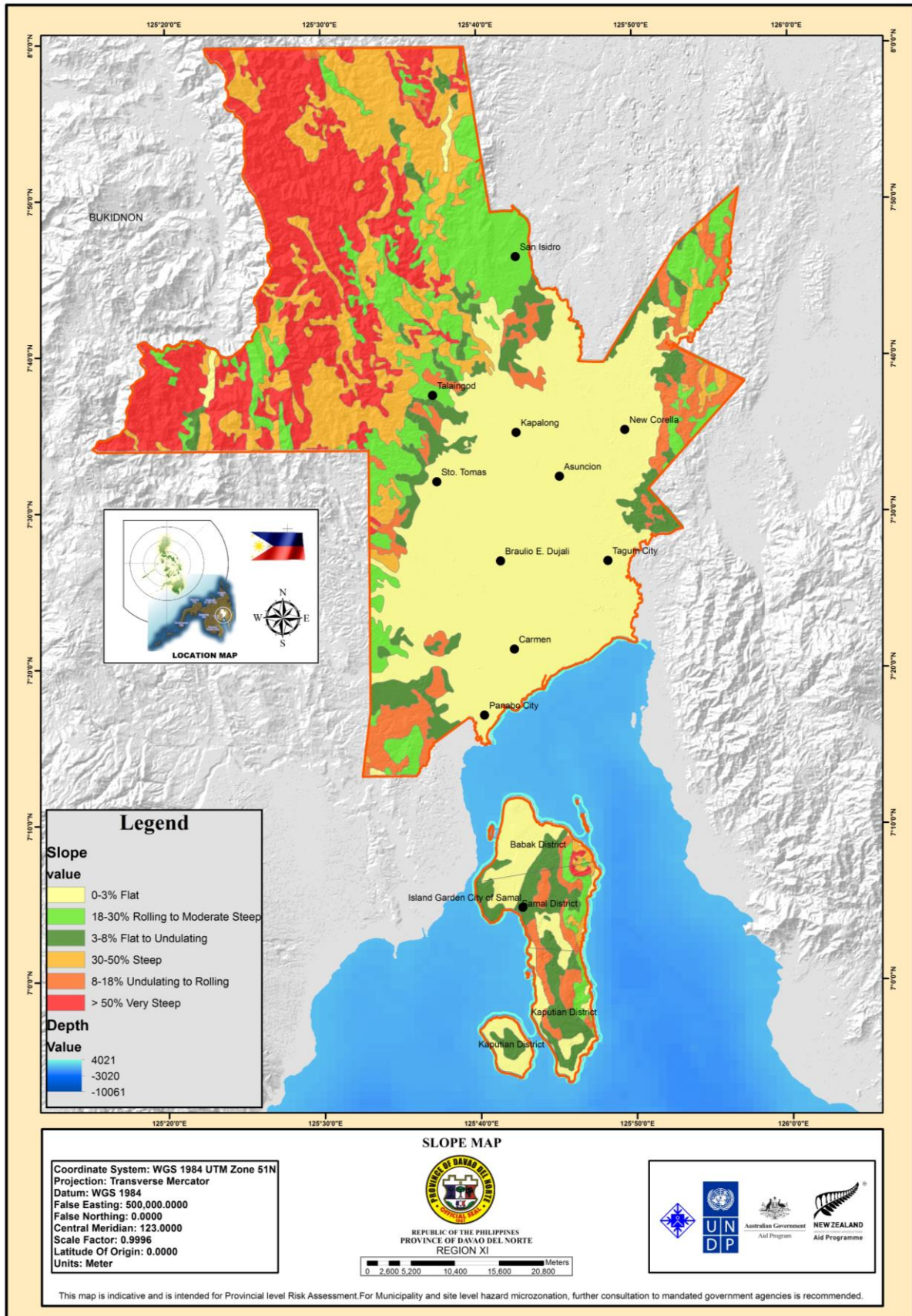
A study conducted by the Sinclair Knight Merz in 2004 for an Integrated Water Resource Development Project for the Province of Davao del Norte identified surface water from Tagum River as a major resource which can provide a large volume for potable drinking water with minimal risk of supply failure. The water in the river will require treatment considering its quality. Likewise water supply needs for agricultural purposes, in terms of volume, accessibility and availability will also have to be given due consideration.

Map 13. Elevation Map, Davao del Norte





Map 14. Slope Map, Davao del Norte



*Table No. 3-15. Drainage Areas and Flow Rates of Major Rivers  
Province of Davao del Norte*

Major Rivers	Drainage Area (km <sup>2</sup> )	Flow Rate (m <sup>3</sup> /sec)		
		Peak	Maximum	Minimum
Hijo	617	150.9	102.5	8.3
Tagum	2,326	654.7	601.9	24.1
Lasang	808	No gauging station present		

Source: *Philippine Water Resources Summary Data, NWRC  
Provincial Water Supply, Sewerage and Sanitation Sector Plan, Davao del  
Norte*

Notes: *Peak – Peak discharge of Daily Maximum Discharge  
Maximum – Maximum Daily Discharge of Weighted Daily Discharge  
Minimum – Minimum Daily Discharge of Weighted Daily Discharge*

Groundwater availability in the province is classified as deepwell and difficult area. Deep well area covers approximately 80% of the province, widely distributed in the river basins of Tagum and Davao rivers. Groundwater is the main source of drinking water in every city and municipality in the province. About 20% of the provincial area is classified as a difficult area to exploit groundwater. Such areas are characterized by mountains in the northwestern side of the province. Springs are the common source of water in these areas. There are 157 developed springs currently serving the populace mostly in the rural areas of the province.

### 3.1.3 Soil characteristics and fertility

#### a. Soil type

The soils of the Province of Davao del Norte have developed from either alluvium washed from the uplands or from materials originating from igneous or sedimentary rocks. Each type of soil has a different fertility, structure and character.

There are seven (7) types of soil in the province. These are:

1. Hydrosol - Under this miscellaneous soil type are the swamps, which are made up of a complex of poorly drained immature soils. These soils are generally brackish or salty and are sandy in some places. A very significant area of this type is utilized as fishponds in the City of Tagum.
2. Camansa Sandy Clay Loam - This soil is one of the most extensive soils in Davao del Norte. It occupies the hilly and mountainous regions on the northern parts of the province. The more gentle slopes of this soil are suited to perennial crops, but the soil on the whole is more suited for forestry purposes.

3. Cabangan Clay Loam - Soil of this type are secondary soils derived from recent Alluvium washed mainly from the uplands underlain by sedimentary. This soil occupies the greater part of the gently rising plain at the head of the gulf. The yields of the different crops on this soil indicate that it is of medium to high productivity. To secure optimum growth for most crops, except lowland rice, artificial drainage for this soil must be provided.
4. San Manuel Silty Clay Loam - This soil is developed from recent alluvium washed from the uplands and deposited by rivers along their courses. A large portion of the areas under this soil type is sometimes flooded and for this reason they make up some of the most productive soils of the province. Because of the natural fertility of the soil, diverse crops are raised on it with moderately high yields.
5. Mountain Soils (Undifferentiated) - The soils classified as mountain soils or undifferentiated are soils or areas that are inaccessible. These soils support the forests of the province and although they have no agricultural importance, they do support forestry farming.
6. Bolinao Clay- The Island Garden City of Samal is composed of this type of soil. The soil is slightly acidic and has a rather poor internal drainage but the production of coconuts, corn, and citrus on the eastern coast compares favorably with that of other soils of the province, though at a much lower level of production.
7. Cabantian Clay- The soils of the Cabantian Clay type are formed in the hilly portions of the City of Panabo bordering the City of Davao. On this soil, crops yield only moderately or even low in some places.

**b. Soil fertility**

The soil fertility of the province is highly categorized under medium acid that is within the range of 5.6-6.0. About 43.98 percent or 167,698 hectares of the total land area are medium acidic. (See Table No. 3-16)

*Table No. 3-16. Soil Fertility, Province of Davao del Norte*

Range	Classification	Area (Has.)	% Distribution
< 4.5	Extremely Acid	36,387	10.33
4.5 – 5.0	Very strongly acid	65,499	17.18
5.1 – 5.5	Strongly acid	26,634	6.98
5.5 – 6.0	Medium Acid	167,698	43.98
6.1 – 6.5	Slightly acid	42,898	11.25

Source: *Land Resources Information System (LARIS)*  
Bureau of Soils and Water Management, DA-RFU XI

### 3.1.4 Mineral resources

Davao del Norte is endowed with rich deposits of non-metallic minerals like guano, marble, limestone and others. It has an estimated total reserve of 44,845,283 MT of non-metallic minerals. The Province also has an abundant source of high grade quality sand and gravel, a major component material in construction. Tagum City, Panabo City and the municipalities of Carmen, Kapalong and Sto. Tomas are the major suppliers of sand and gravel. Total production of sand and gravel in 2008 has reached to 268,170 cu. m. In Region XI, Davao del Norte is the second largest producer of sand and gravel, next to Davao City. Comparative volume of production of this non-metallic resource in the region is presented in Table No.3-17.

Table No. 3-17. **Estimated Non-Metallic Resources  
Province of Davao del Norte, 2013**

<i>Non-Metallic Mineral</i>	<i>Locality</i>	<i>Total Reserve (M.T)</i>
1. Guano Phosphate	Samal & Talikud Is.	112,400
2. Rock Phosphate	Samal & Talikud Is.	43,800
3. Sand & Gravel	Lasang River, Panabo City Sto, Tomas and Carmen River	1,800,000
4. Marble Deposit	Igang Tagasan, Kapalong	35,000
5. Limestone/ Lime Raw Materials	New Visayas & Ulugan Kapalong	7,854,083
6. Magnesite	Igang, Tagasan, Kapalong	35,000,000

Source: MGB XI

### 3.1.5 Climate and rainfall

The province has Type IV climate under the coronas classification and is characterized by unpronounced dry and wet seasons. Rainfall is more or less evenly distributed throughout the year with no pronounced rainy season and dry season. Davao del Norte is no longer typhoon-free as it is used to be. The province has experienced the onslaught of typhoon Pablo in December 2012 which brought damages on infrastructure and agriculture. The fairly pronounced rainy months in the province are from November through February. The province's average monthly rainfall, based on data from the PAG-ASA Agromet Station in Tagum City, has been decreasing from 251.2 mm in 2006 to 177.6 mm in 2012. Similarly, the annual rainfall dipped from 3,014.5 mm in 2006 to 2,131.3 mm in 2012 (Table 3-18).

Table 3-18. Monthly and Annual Rainfalls (in mm), 2006 to 2012, Davao del Norte

Month	2006	2007	2008	2009	2010	2011	2012
January	221.9	320.2	153.8	162.1	206.1	194.8	190.0
February	433.4	153.6	168.9	139.6	15.3	347.7	260.2
March	327.7	168.4	272.8	121.1	67.5	210.8	308.2
April	183.9	80.2	71.9	267.1	132.3	110.4	191.9
May	325.9	314.4	222.9	266.2	259.2	388.7	143.8
June	211.4	209.7	213.4	190.4	208.2	173.0	94.2
July	196.3	209.9	75.5	93.1	161.4	315.2	153.9
August	168.2	342.1	46.7	171.3	249.9	326.7	181.6



September	393.8	67.5	211.7	147.4	70.6	257.3	184.3
October	319.9	240.4	265.1	104.6	167.5	254.4	249.6
November	146.7	200.4	252.6	255.8	226.8	224.7	173.6
December	85.4	192.5	175.6	232.9	185.1	233.7	239.3
<b>Total</b>	<b>3,014.5</b>	<b>2,499.3</b>	<b>2,670.9</b>	<b>2,251.6</b>	<b>1,950.9</b>	<b>3,037.4</b>	<b>2,131.3</b>
<b>Average</b>	<b>251.2</b>	<b>208.3</b>	<b>172.58</b>	<b>187.6</b>	<b>162.5</b>	<b>253.1</b>	<b>177.6</b>

Source: PAG-ASA Tagum City Agromet Station as cited in the SEEP of Davao del Norte, 2012

Table No. 3-19. Average Monthly Relative Humidity  
Province of Davao del Norte

Month	Relative Humidity							
	2006	2007	2008	2009	2010	2011	2012	2013
January	90.8	90.79	74.50	90.00	91.00	87.7	89.4	100.05
February	90.7	88	82.00	89.00	82.00	88.8	90.4	94.5
March	89	86	85.00	88.00	86.00	88.4	85.5	90.5
April	87.16	85	83.00	86.00	79.00	81.4	87.2	90.1
May	88	87	82.50	89.00	86.00	88.0	87.0	92.35
June	91	88	83.50	86.00	90.00	89.0	87.0	94.85
July	89	86.7	81.00	88.00	89.00	88.6	88.0	86.25
August	90.1	89	81.50	87.00	88.00	85.0	87.0	93.63
September	90.7	87.4	83.50	92.00	85.00	89.4	87.0	99.6
October	89.27	87.3	81.00	85.00	88.00	88.0	88.0	96.4
November	88.57	88.1	78.50	90.00	89.82	89.6	90.00	94.7
December	88	88.1	77.50	92.00	91.60	91.0		91
Average	89.36	87.62	81.13	88.50	87.12	87.9	87.88	

Source: PAG-ASA Tagum City Agromet Station as cited in the SEEP of Davao del Norte, 2012

Humidity is a measure of the amount of water vapor in the air. Relative humidity refers to the ratio of the amount of water vapor present in a given volume of air to the amount of vapor required for saturation at the existing air temperature. Table No. 3-19, provides a five-year information of the average monthly relative humidity of the province of Davao del Norte from 2003 to 2007. Average range of humidity for the past five years is from 78 to 89.36.

### Historical Temperature Record

Historical data on mean seasonal temperature as shown in Table 3-20 indicates that in the span of 30 years (1971-2000), Davao del Norte has experienced hot temperature at 27.8°C during the summer months of March to May. During the rainy months of December to February temperature is colder at 26.7 °C, while the temperature for the rest of the months is at 27.4 °C. Comparing the temperature to the rest of the months, temperature on March, April and May is higher by 1.1 to that of December, January to February and 0.2 to the rest of the months.

The temperature is expected to further increase in 2020 and 2050 given the high-range and medium-range scenarios. Although the highest increase in temperature is during the months of June, July and August in 2020 and 2050 under the medium-range emission

scenario but still the hottest months would be from March to May as indicated in the table below.

Table 3-20. Baseline and Projected Temperature 2020 and 2050

Province	Baseline Observed				High-Range Emission Scenario				Medium-Range Emission Scenario			
	Average for 1971-2000				Temperature Change (°C) Projections for 2020							
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Davao del Norte	26.7	27.8	27.4	27.4	0.8	0.7	0.8	0.8	0.9	1.1	1.2	1.1
					27.5	28.5	28.2	28.2	27.6	28.9	28.6	28.5
Davao del Norte	Average for 1971-2000				Temperature Change (°C) Projections for 2050							
	26.7	27.8	27.4	27.4	1.7	1.8	1.6	1.6	1.9	2.3	2.5	2.1
					28.4	29.6	29.0	29.0	28.6	30.1	29.9	29.5

### Historical Rainfall Record

Based on historical data of 30 years (1971-2000) as shown in table 3-21 December, January and February (DJF) months poured a lot of rainfall in the province at 637 mm. The amount rainfall reduced during the months of March, April and May (MAM) and then increase again from the months of June, July and August (JJA) to September, October and November (SON) until it reaches the rainy months of December to February.

The scenario as indicated in table 3-21, in 2020 and 2050 is different. There is reduction in rainfall in the province during the summer season making the usually dry season drier. While dry season becomes drier, wet season becomes wetter as huge amount of rainfall is projected to drop in the months of December to February.

Table 3-21. Baseline and Projected Rainfall Change (in %): 2020 and 2050

Province	Baseline Observed (mm)				High-Range Emission Scenario				Medium-Range Emission Scenario			
	Normal Values for 1971-2000				Rainfall Change ( %) Projections for 2020							
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Davao del Norte	637.0	496.5	535.6	556.2	-10.1	0.2	-0.1	2.2	9.2	-12.5	-3.6	-1.5
					Projected Rainfall in 2020							
					572.6	497.5	535.1	568.4	695.6	434.4	516.3	547.8
Davao del Norte	Normal Values for 1971-2000				Rainfall Change ( %) Projections for 2050							
	637.0	496.5	535.6	556.2	-33.7	-17.3	15.7	14.9	1.1	-22.2	-7.9	-2.2
					Projected Rainfall in 2050							
				422.3	410.6	619.7	639.1	644.0	386.3	493.3	543.9	

Table 3-22. Projected Maximum and Minimum Temperature Increase: 2020 and 2050

Province	Baseline Observed (mm)				High-Range Emission Scenario				Medium-Range Emission Scenario			
	Normal Values for 1971-2000				Temperature Change (°C) Projections for 2020							
	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON	DJF	MAM	JJA	SON
Davao del Norte	31.2	32.8	32.0	32.3	1.0	0.8	0.8	0.8	1.0	1.5	1.5	1.2
Maximum Temp Increase	Normal Values for 1971-2000				Temperature Change (°C) Projections for 2050							
	31.2	32.8	32.0	32.3	2.1	2.2	1.6	1.5	2.4	3.2	3.2	2.4
Minimum Temp	Normal Values for 1971-2000				Temperature Change (°C) Projections for 2020							



Increase												
Davao del Norte	22.1	22.7	22.7	22.6	0.7	0.6	0.8	0.8	1.0	1.0	1.1	1.1
Minimum Temp Increase	Normal Values for 1971-2000				Temperature Change (°C) Projections for 2050							
Davao del Norte	22.1	22.7	22.7	22.6	1.6	1.6	1.8	1.8	1.8	1.9	2.3	2.2

### 3.2 Land use potentials and constraints

#### 3.2.1 Land classification

Davao del Norte has a total land area of 346,280<sup>1</sup> hectares, of which 192,459.52 hectares or 55.6 percent are classified as Alienable and Disposable (A&D) and 153,820.48 hectares or 44.4 percent as forestland. Land classification is based on the criteria set by law. All lands with an 18-degree slope and higher are considered forestland regardless of whether these lands have forest cover or not. Areas characterized with a slope of less than 18 degrees are classified as alienable and disposable.

Table No. 3-23 : Area and Location of A&D lands and Forestlands  
Province of Davao del Norte

City/Municipality	Total Area (has.)	Alienable and Disposable (A&D)		Forestlands	
		Area (has.)	% Distribution	Area (has.)	% Distribution
Asuncion	27,347.00	18,924.12	69.2	8,422.88	30.8
B. E Dujali	9,100.00	9,100.00	100	0	0
Carmen	16,625.00	16,525.25	99.4	99.75	0.6
Kapalong	94,586.00	19,673.89	20.8	74,912.11	79.2
New Corella	30,822.00	24,657.60	80.0	6,164.40	20.0
San Isidro	15,249.00	4,788.19	31.4	10,460.81	68.6
Sto. Tomas	32,041.00	26,658.11	83.2	5,382.89	16.8
Talaingod	45,496.00	2,274.80	5.0	43,221.20	95.0
IGC of Samal	28,071.00	25,572.68	91.1	2,498.32	8.9
Panabo City	25,363.00	24,881.10	98.1	481.90	1.9
Tagum City	19,580.00	19,403.78	99.1	176.22	0.9
<b>Total</b>	<b>346,280.00</b>	<b>192,459.52</b>	<b>55.6</b>	<b>153,820.48</b>	<b>44.4</b>

Source: DENR XI

Note: GIS computation based on the Land Classification Map from DENR-XI, land area not authoritative, for planning purposes only, includes area for mangrove forest.

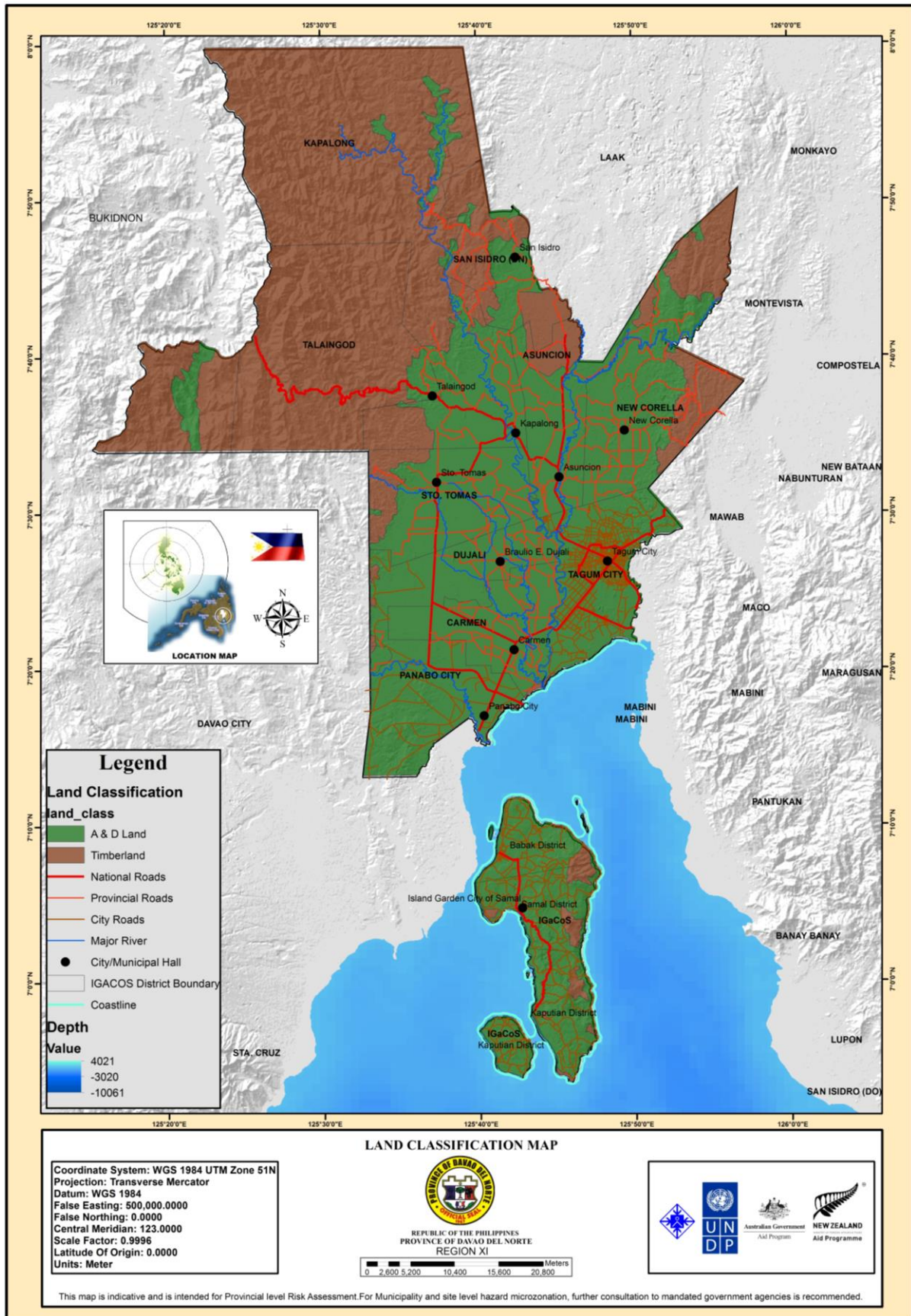
Alienable and disposable lands (A&D) are those lands of the public domain which are classified and determined not to be needed for forest purposes and are available for disposition under Commonwealth Act No. 141 as amended by the Public Land Act. It also specifies that no land of the public domain, 18% in slope or over which have already been declared as A&D shall be reverted to the classification of forestlands. A&D lands are used for agriculture, settlements, infrastructure and utilities, industries, tourism and others.

<sup>1</sup>Land area is not authoritative. GIS computation is based on the Land Classification Map of DENR-XI. Land area used in this plan is for planning purposes only.

Forestlands are those lands of the public domain which have been classified as such and declared as needed for forestry purposes. Forestlands are also watershed which inherently produce more benefits and give better service than when converted to agricultural lands or other uses, such that, those lands are not to be titled. Forestlands in the province include production and protection areas. Not all forestlands are covered with forest trees. Areas categorized as production forest in the province is about 74,944.70 hectares, while the areas categorized under protection forest is approximately 60,773.52 hectares.

There are two major watersheds in Davao del Norte. These are the Saug-Libuganon watershed covering 247,500 hectares and the Tuganay watershed with 69,375 hectares covers the municipalities of Sto. Tomas, B. E Dujali, Carmen and part of Talaingod. These watersheds should be able to sustain life and provide economic benefits. Rehabilitation and protection of the province watershed through reforestation program is of prime consideration of the provincial government. Saug-Libuganon watershed covers the municipalities of Asuncion, New Corella, San Isidro, Kapalong, Talaingod and the City of Tagum.

Map 15. Land Classification Map, Davao del Norte



### 3.2.2 Land suitability

According to the land capability analysis in the Davao Integrated Development Program (DIDP) Master Plan Study, Davao del Norte is suitable for lowland paddy, upland crops, upland crops/orchard, orchard and pasture. Some areas in the lowland (Carmen, B.E Duajli, Tagum) is found unsuitable for agriculture since these areas are frequently affected by flooding which is causing damage to crops and properties. These areas can still be developed and its usefulness and productivity optimized, if mitigating measures like flood control and drainage projects are provided. Some areas in the western part of Kapalong and Talaingod are also identified as unsuitable for agriculture because of the presence of steep slopes characterized by severe erosion.

In the Provincial Physical Framework Plan (PPFP) of Davao del Norte, land suitability is classified based on the degree to which the characteristics of the land can satisfy the environmental requirements of specific crops without deterioration of the land resource.

In identifying land suitability, the Land Management Unit (LMU) is assessed to determine whether the characteristics of the land can satisfy the environmental requirements of the crop using the following criteria:

#### Production Forest

- Presence of loggable forest
- No serious erosion hazard
- Slopes <50% and land < 1000 m. elevation
- No serious limitation of terrain or rock

#### Plantations

- As for production forest loggable forest need to be present. Also because of greater need for access and management, slopes should be <30% and the limitation of terrain or rock should be less severe.

#### Irrigated Rice

- Slopes <3%, up to 8% if terraced
- Low soil permeability
- Availability of irrigation water
- No significant limitation of rock, erosion, soil depth, etc.
- Presence of problem soils downgrade the suitability but is not necessarily limiting

#### Cultivated Annual Crops

- No significant existing erosion (or a low soil permeability)
- Slopes <8% (benchmark of erosion hazard)
- Adequate soil depth (>50cm)
- No flooding or poor drainage
- No problem soils
- No serious limitations of terrain or rock

Perennial Tree and Vine Crops

- For cultivated annual crops that can be placed on more erodible slopes. A slope limit of 18% may be allowable.

Pastures

- No serious existing erosion
- Slopes <18% if land is erodible
- Slopes <50% if land is stable
- No serious limitation of terrain, flooding, etc.

The land suitability analysis indicates that irrigated rice is suitable in the municipalities of Carmen, New Corella, Asuncion and B. E Dujali. Trees and vine crops is suitable in more areas of Island Garden City of Samal, San Isidro and Panabo City. Forestry plantation is suitable in the municipalities of Kapalong, New Corella, Sto. Tomas and Asuncion, while production forest is suitable in Talaingod and Kapalong. Data on Land Suitability is presented in Table No. 3-24.

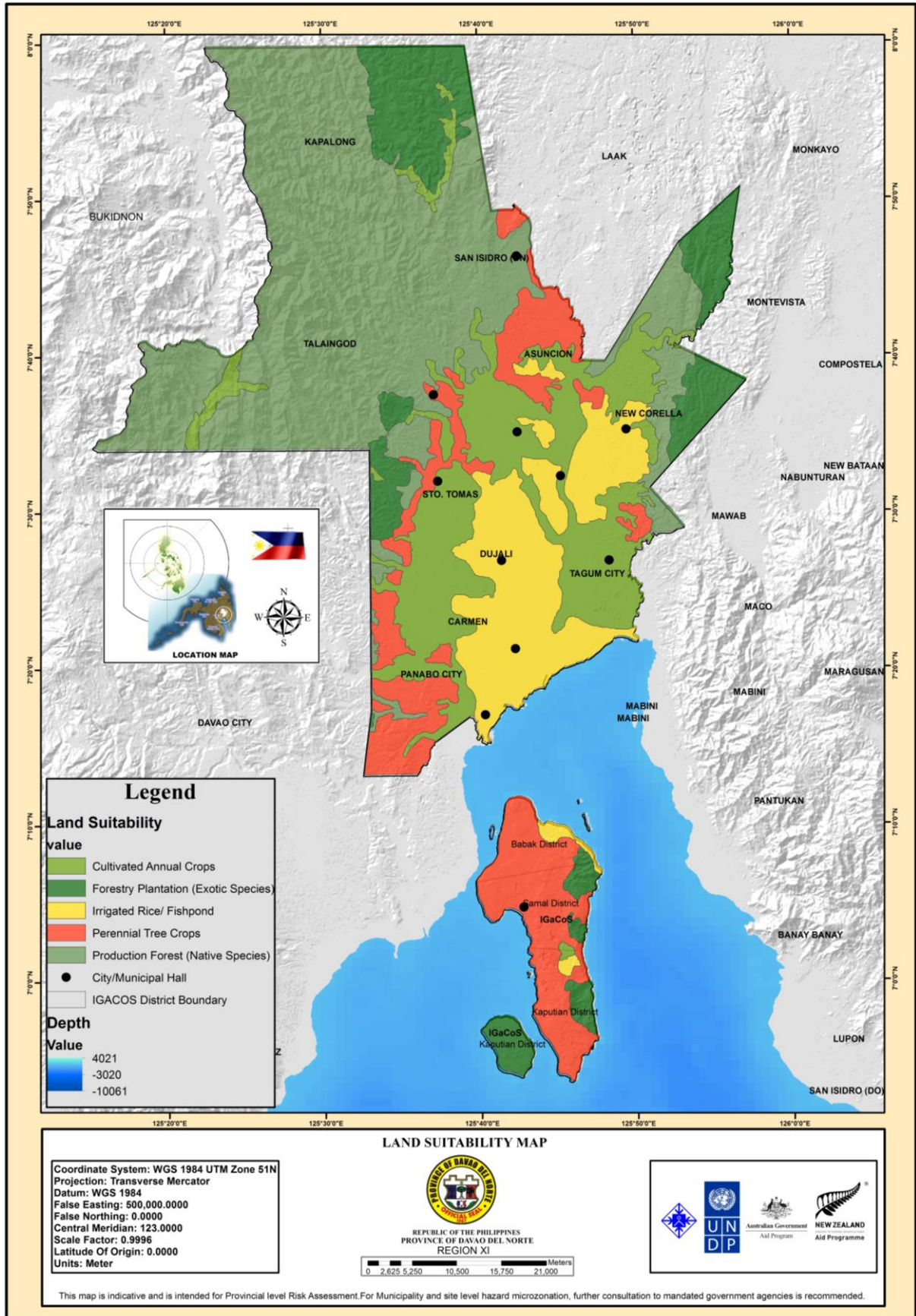
*Table No. 3-24 : Land Suitability Classification (in hectares)  
Province of Davao del Norte, 2013*

Suitability Class	Area	% Distribution
Suitable for Rice Paddy	48,348.90	14 %
Suitable for Cultivated Annual Crops	55,939.90	16 %
Suitable for Perennial Tree Crops	64,057.50	18 %
Suitable for Forestry Plantation	44,733.90	13 %
Suitable for Production Forest	133,201.50	39 %
Total	346,280.00	100 %

*Source: PFP, Davao del Norte, 1996, BSWM-XI*



Map 16. Land Suitability Map, Davao del Norte



### 3.2.3 Land sustainability

As applied to land use, sustainability of land use means a form of use that are able to be continued on and into the future with the same level of productivity and with no deterioration of the land resource. The principles inherent in the land use sustainability approach to land resource management are the following:

- a. All land should be used in a way that production from it is sustainable in perpetuity. It should not be used in such a way or at such intensity that it deteriorates and loses productive capacity for any form of use that it initially possessed.
- b. Sustainable land use can only be achieved by using the land within the limits of its sustainability for use.
- c. Good quality agricultural land is finite, scarce and non-renewable resource and should be protected for agricultural use.

Three categories are adapted in assessing the degree of land use in the sustainability approach and defined correspondingly as follows:

1. Sustainable land use – land which is being used in accordance with its suitability
2. Under-used or development opportunity land – land being used at a level of intensity that is below the intensity it is suitable
3. Not sustainable or over-used land – land being used at a level of intensity that is in excess of its suitability for use.

The existing land use is compared with the suitability of the land for those uses to determine whether the land is being used in a sustainable way. More than one-half of the total A&D lands within the province are used at a level of intensity that is below the intensity it is suited for. Approximately, 111, 261.17 hectares are under-used or classified as development opportunity lands.

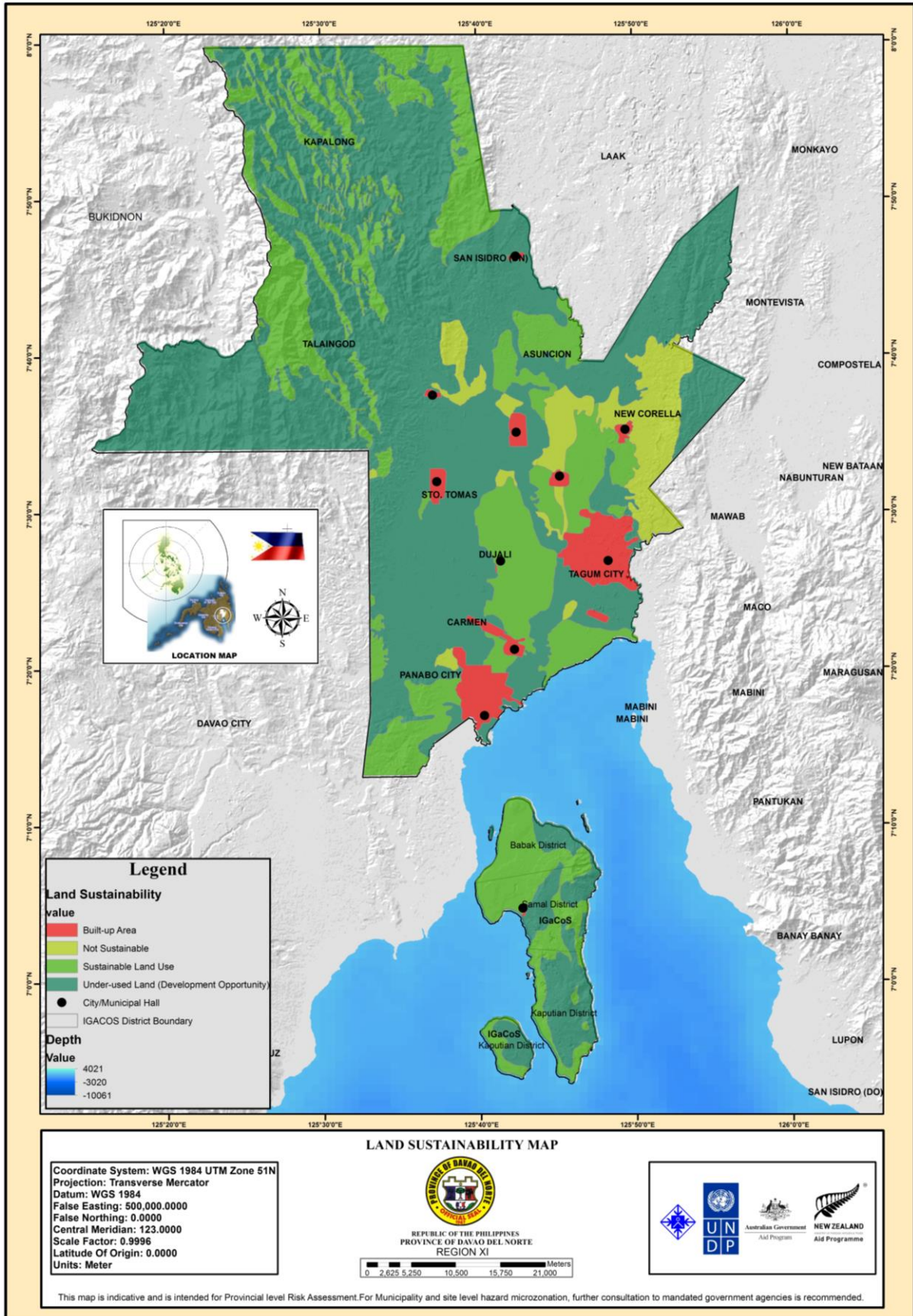
Lands being used in accordance with its suitability are 72,736.70 hectares. The municipality of B.E Dujali and the Island Garden City of Samal are the two LGUs with the highest number of lands used in a sustainable way.

On the other hand, over-used lands or lands being utilized at a level that is in excess of its suitability for use is evident in the municipalities of New Corella, Asuncion and Kapitalong.

In areas classified as forestland, about 23 percent of the total area is used in a sustainable manner, while 77 percent are under-used or can be considered as development opportunity.



Map 17. Land Sustainability Map, Davao del Norte



### 3.2.4 Protection areas

Protection land is a portion of land and water set aside for its unique physical and biological diversity and protected against destructive human influences or impacts.

Davao del Norte's protection lands include the Mangrove Swamp Forest Reserve in Babak, Non-NIPAS, Network of Protected Areas for Agricultural Development/Strategic Agriculture and Fisheries Development Zone (NPAAD/SAFDZ) and severely eroded areas.

NIPAS areas in Davao del Norte are the 7,656 hectares Samal Island Protected Landscape/Seascape which was proclaimed under Proclamation No. 2152.

The Non-NIPAS areas cover second growth forest above 1000 m. elevation or more than 50% slope, mangrove forest and buffer strips along rivers and escarpments. Approximately, 47,758.83 hectares are under this category of protection lands.

SAFDZ area in the province is accounted at 132,382 hectares. The identification and setting aside of the NPAAD and SAFDZ ensure that the future expansion of successful agriculture and fishery production promoted under the Agriculture and Fishery Modernization Act (AFMA) shall be done on economically and environmentally suitable lands.

Of the total SAFDZ area, 125,847 has. or 96.1 % are identified as Strategic Crop Sub-Development Zone, 3,861 has or 2.9 % as Strategic Fishery Sub-Development Zone, 2,120 has. or 1.6 % as Integrated Strategic Crop/Livestock Sub-Development Zone, while Integrated Strategic Crop/Fishery Sub-Development Zone is approximately 554 has. or 0.4 %. Total SAFDZ area of the province is 21.6 percent of the region.

Another category of "protected" land includes certain types of agricultural lands. The concept of protection in this case varies from that other categories of protected areas. Under NPAAD/SAFDZ, some agricultural lands are "protected" against any irreversible conversion such as urban use. The main purpose of such protection is to keep and preserve the highly suitable agricultural lands for long-term food security of the nation.

The NPAAD/SAFDZ highly restricted agricultural land covers the most efficient agricultural lands, which are the traditional sources of food and cash crops. These are the most stable crop lands with moderate levels of farm management requirement. In addition, these lands are usually supported by large investment in infrastructure. Remaining NPAAD in Davao del Norte covers agricultural lands that are ecologically fragile and those lands that are covered with grasses.

Table No. 3-25. Area of Major Categories of Protection Lands and SAFDZ  
By City and Municipality, Province of Davao del Norte

City/Municipality	NIPAS (has.)	Non-NIPAS (has.)	Areas with severe erosion (has.)	SAFDZ (has.)	Total
Asuncion			10,175.8	8,337	18,512.8
B.E Dujali				8,712	8,712.0
Carmen				16,910	16,910.0
Kapalong		27,808.83*	78,200.3	11,661	89,861.3
New Corella		26.40*	6,542.0	16,377	22,919.0
San Isidro	-	-	-	-	-
Sto. Tomas		134.80*	5,724.8	18,750	24,474.8
Talaingod		19,434.50*	37,461.5	1,475	38,936.5
IGC of Samal	7,656.00	-	6,141.6	23,371	29,557.1
Panabo City			3,231.5	13,400	16,736.5
Tagum City				13,389	13,389.0
Davao del Norte	7,656.00	47,758.83*	147,477.5	132,382	279,759.5

\* within areas affected by severe erosion

Data for San Isidro is still included in Asuncion and Kapalong

Source: SAFDZ, DA-BSWM, 1997

PPFP, Davao del Norte

### 3.2.5 Environmentally critical areas

Environmentally critical areas include flood prone areas, areas susceptible to soil erosion, salt water intruded areas and areas traversed by geologic fault lines. Map 18 shows the fault lines traversing Davao del Norte.

Areas subject to natural hazards include those weather-related hazards to earthquake-induced hazards and those subject to volcanic hazard. Fault line is one natural hazard where lateral or vertical displacement (movement) is likely to occur. Episodic movements along this “active” fault lines cause earthquakes with accompanying destruction of property and may be loss of life.

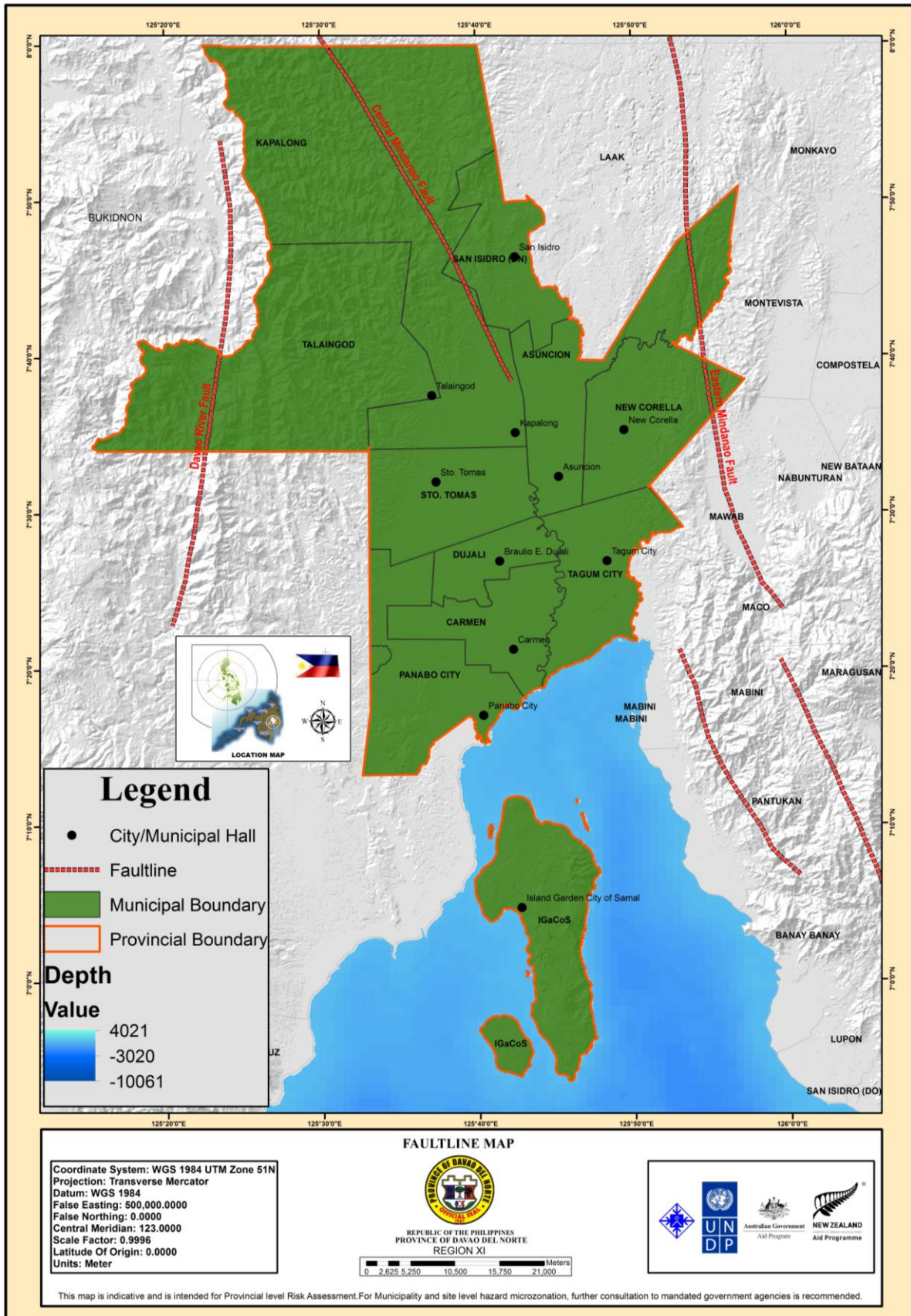
The vulnerability assessment relative to flooding, landslides and earthquake hazards was conducted by Mines and GeoSciences Bureau (MGB). The results were translated into GIS maps.

#### a. Flood prone areas

Davao del Norte’s physiographic characteristics made it naturally susceptible to floods and flashfloods. The province has generally a low land terrain comprising 35.1 percent of the total land area with slope of 0-3%. Fifteen (15) rivers and several creeks traverse the province. The bigger rivers such as the Lasang, Tagum/Libuganon, Saug and Tuganay drain the broad plain west and north into Davao Gulf. Tagum/Libuganon River with a



Map 18. Fault Lines Traversing Davao del Norte





total length of 95 kilometers is the longest among the major rivers in the province and has a total watershed area of 247,500 hectares. It originates from the eastern hillside of the Mindanao Central Cordillera and flows to the central alluvial plain, and then extends to Davao Gulf.

Alluvial plains of Davao del Norte are mostly affected by flooding due to its low physiography and the inability of the nearby rivers to cope

with high flood discharge due to heavy siltation of the rivers and other waterways , thereby limiting the physical and economic productivity of the land.

Flood hazard susceptibility zones were derived based on the geomorphological analysis of landforms and the fluvial system. Information on flood occurrences, flood depths, duration of inundation as well as topographic information supported the geomorphologically-based flood. Levels of susceptibility were classified as low, moderate, high and very high. About 9,605.48 hectares have very high susceptibility to flooding while, 30,227.65 hectares have high susceptibility to flooding. The municipalities of Asuncion, Kapalong, Stomas and B.E. Dujali have large areas that are very susceptible to flooding. On the category of high susceptibility, the municipality of Carmen has the largest area, followed by Asuncion, B.E. Dujali and Kapalong. (Table 3-26).

Table 3-26. Areas Susceptible to Flooding, Davao del Norte (in hectares)

City/Municipality	Very High Susceptibility Area (VHSA)	High Susceptibility Area (HSA)	Moderate Susceptibility Area (MSA)	Low Susceptibility Area (LSA)
Asuncion	3,222.64	5,671.44	1,438.09	514.20
B.E. Dujali	1,162.25	4,907.80	2,373.55	417.46
Carmen	475.12	6,218.12	4,825.53	4,236.41
Island Graden City of Samal (IGACOS)	0	0	0	0
Kapalong	1,836.32	3,608.66	2,446.53	1,357.52
New Corella	737.87	3,056.07	2,049.01	1,277.84
Panabo City		1,276.02	1,836.77	7,334.31
San Isidro	157.02	183.32	291.71	0.71
Sto. Tomas	1,358.35	2,947.34	3,974.09	6,341.92
Tagum City	655.92	2,357.27	87.64	51.08
Talaingod		1.60	2.03	
<b>Davao del Norte</b>	<b>9,605.48</b>	<b>30,227.65</b>	<b>19,324.95</b>	<b>21,531.45</b>

Note: Area generated thru GIS from the MGB Map

### Flood Occurrence



The recurrence of floods almost every year in the province reveals its vulnerability to the hazard with a total of seven (7) flooding events recorded from year 2006 to 2011, affecting 252 barangays. The municipalities of Carmen, B.E. Dujali, Asuncion, New Corella and the City of Tagum are the most affected by flood occurrences. The lowland areas of these municipalities form the greater plain area and the central part of the province. Flood events usually occur in the 1<sup>st</sup> and the last quarter of the year. Per record of the PDRRMC, there were 85,610 families affected by floods/flashfloods from 2006-2011. Agricultural lands, crops, livestock and infrastructure were also destroyed or damaged every time flooding occurs. The most number of affected municipalities and barangays were recorded in 2009, while the most number of families affected was in 2006.



In December 4, 2012, typhoon Pablo hit Davao del Norte and caused massive destruction in the province and its neighboring provinces of Compostela Valley and Davao Oriental. A 25 mm per hour rainfall was recorded in the Automatic Weather Systems installed at the PDRRMC Operations Center in the Provincial Capitol at the height of the typhoon. The recorded rainfall intensity was more than enough to submerge most areas of Davao del Norte, particularly the flood prone areas and those areas lying along the major river courses of Libuganon, Saug, Tuganay and Hijo rivers.



There was widespread destruction in the province due to strong winds brought by the typhoon and the flooding in low lying areas due to high intensity rainfall spawned by the



typhoon. Roads were damaged due to scouring caused by floods and run-offs. Some bridges were also damaged due to scouring of embankments and abutments caused by debris carried by strong water currents in swelling river courses. Major river courses swelled; Libuganon, Saug, Tuganay, Hijo rivers exceeded their carrying capacities due to intense rainfall spawned by the storm. In effect, many areas were inundated affecting farmlands and built-up areas. Many houses, schools and other infrastructures were damaged due to strong winds. Scores of families have to be evacuated because of houses being damaged and/or severely flooded.

Typhoon Pablo brought massive damage and destruction in agriculture industry in Davao del Norte, particularly the Cavendish banana industry. The industry propelled the economy of the province, contributing more than 60% of provincial income and provides livelihood to a lot of families. Damages to the industry valued at Php 2.62 Billion will impact to reduce the income of the province in the next 10 months. Cavendish banana workers affected to number around 13,600 will be losing at least Php 300.00 per day for the next four to nine months. In an unabated condition, many will be clamoring for government assistance and subsidies, and a number of them will add up to the recipients to the 4Ps program of the government.

The damages to roads and bridges will slow down the delivery of goods and services to areas served by the networks. It stagnate development and may cause artificial shortages of basic goods in the area affected.

Based on the destruction of properties and its effects on the victims and their families, flooding proved to be the number one on the list of disasters in the Province. A rundown of flood and flashflood occurrences that have affected the province in the past is presented in Table 3-27. Flooding in these periods was caused either by, LPA, ITCZ and typhoons such as Pablo in 2012 and Typhoons Crising and Zoraida in 2013.

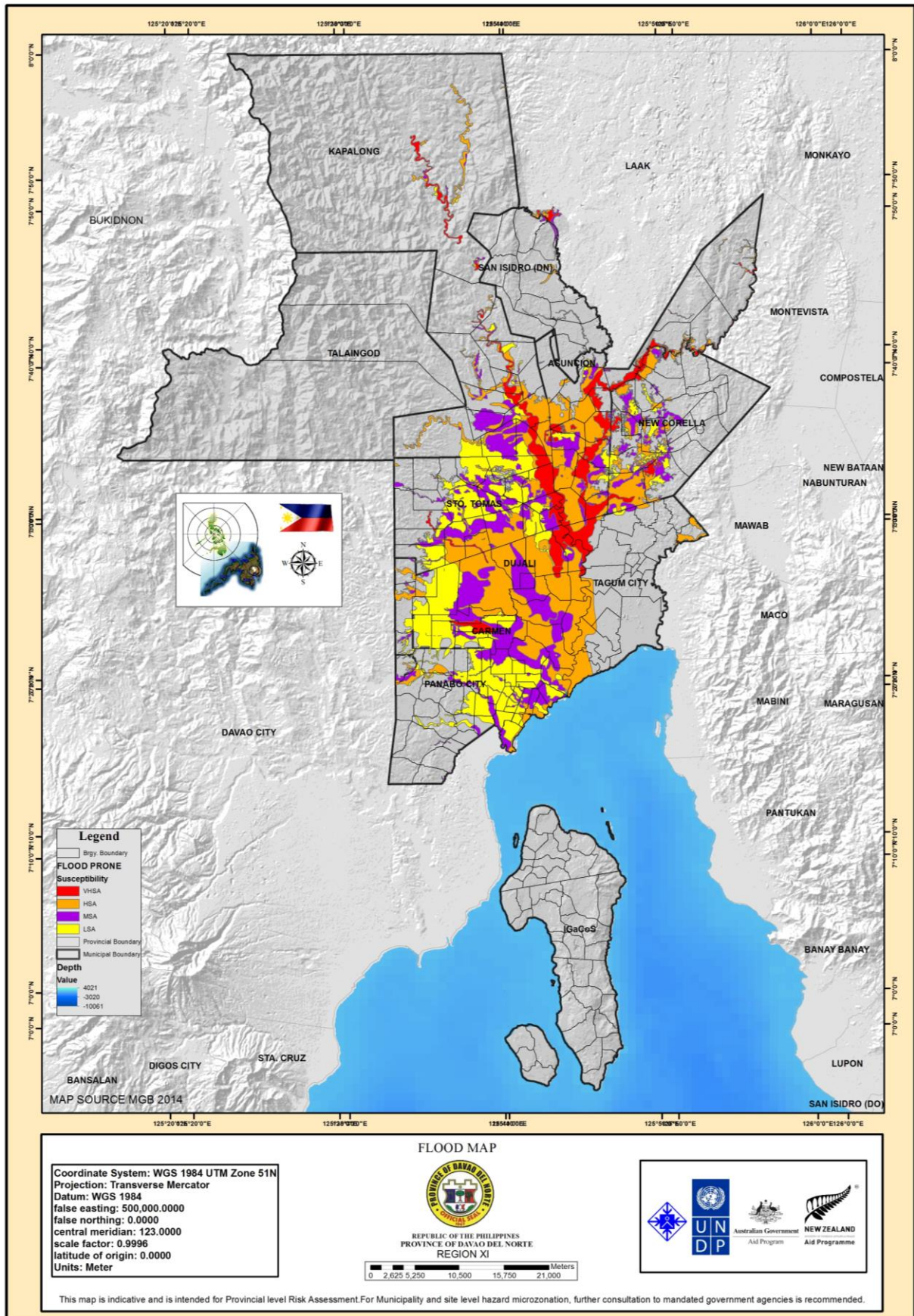
**Table 3-27. Past Flood Events in Davao del Norte**

Year	No. of Affected Municipalities/Cities	No. of Affected Barangays	No. Of Families Affected	Agri. Area affected (has.)	Damage crops (est. Cost)	Damage Livestock (est. Cost)	Damage Fishery (est. Cost)	Damage Infra (est. Cost)
2006	3	19	8,159		6,655,428.00			17,430,000.00
2007	7	63	24,562		82,210,572.00	185,000.00	63,505,000.00	52,316,000.00
2008	4	32	6,777		19,891,842.00	150,000.00	650,000.00	24,008,000.00
2009	7	74	19,343		66,241,814.00	188,450.00	6,819,300.00	60,050,000.00
2010	3	5	82		35,300.00			

2011								
July 1-5	8	42	15,384	4,022.86	36,896,964.00	164,875.00	1,100,000.00	24,865,000.00
Nov. 9-14	2	17	8,610	558.9	1,300,000.00			4,950,000.00
Dec. 2012	11	106	42,413	23,160.03	2,808,610,232.00	547,900.00	900,000.00	768,269,282.00
Feb. 2013	6	55	32,492	5,635.07	128,065,014.30	276,485.00		
June 2013	8		7,575		4,022,591.00			22,145,325.00

Source: Provincial Disaster Risk Reduction and Management Division, Davao del Norte

Map 19. Flood Map, Davao del Norte



**b. Landslide Prone Areas**

Landslides (or mass movements) are downward and outward movement of materials, including rock and soil due to various causes such as excessive rain, earthquake, volcanic eruption, rapid undercutting by rivers, waves or man’s activities.

Areas prone to landslides typically include old landslide deposits along, near or beneath steep slopes and down slope of streams and creeks; thick soil or fractured rocks; those along or on top of cut slopes; and developed steep slopes with no appropriate drainage. Human activities sometimes contribute to the susceptibility of the area to landslides. Building structures around or on top of slopes, pipe leakages, septic system and irrigation discharges, and vibrations from machinery and from blasting can increase pressure and weaken the soil.

Landslide hazard susceptibility zones were derived through qualitative map combination using lithogy, geomorphology, slope gradient and fault distance. DENR-MGB has set four possible levels of susceptibility to landslides (Table 3-28). Each level was defined based on characteristics of slope, cracks, and recent landslide activities. Even without the benefit of a map, one can still identify active landslide areas by looking for cracks or scars, surface depressions, disturbance of the drainage patterns; hummocky topography; and ear-lobe like bulges near base of slopes.

Table 3-28. Landslide Susceptibility Levels

Susceptibility Levels	Description
High Susceptibility	Presence or active/recent landslides Large tension cracks that would affect the community Areas with drainages that are prone to landslide damming Steep slopes (21%-55%gradient)
Moderate Susceptibility	Areas with inactive and old landslides Small tension cracks are located away from community Moderately steep slopes (15%-30%) Small, shallow landslides (<1.0 vertical displacement)
Low Susceptibility	Gently sloping to sloping Absence of tension cracks Flat terrain (5%-15%)
Possible Landslide Debris Accumulation Zone	Areas to be likely affected by transported landslide materials

Rugged, mountainous and moderately to steeply sloping areas on the western part and a wide alluvial plain on the central lowland generally characterize the topography of the province. Majority of the area of the province (27.70%) are with a slope ranging from 30-

50%. This topographic characteristics of the province, made it highly vulnerable to hazard such as landslides. This is aggravated by the deteriorating condition of the upland areas due to forest degradation brought about by illegal logging activities in the past and unsustainable farming practices.

***Rain-Induced Landslide***

Basing on the map from the Mines and Geosciences Bureau (MGB) 33 barangays in 6 municipalities and 1 city have areas with high susceptibility to rain-induced landslides. These barangays are located in areas with high elevation and steep slopes. These 33 barangays represents 14.7 percent of the total barangay of the province. Among the municipalities, Kapalong have the widest area which are high susceptible to landslide at 56,434.90 has., followed by Talaingod with 34,914.90 has. Majority of the area of these two municipalities are classified as forestland, with 95 percent for Talaingod and 75.2 for Kapalong.

Municipalities with high Potentially Affected Population in high susceptibility area are Kapalong and Talaingod with 29,346 and 18,854, respectively. Under the Moderate susceptibility area, the municipality of Kapalong and Sto. Tomas are the top two LGUs with high potentially affected population (Table 3-29).

Data from the PDRRMC indicate that the province has experienced landslide though in a relatively small magnitude in 2008, 2009 and 2010. Eight (8) barangays in four (4) municipalities were affected by this event. In February 2013 during typhoon Crising, landslide occurred in one (1) barangay in New Corella affecting 156 families. Fortunately, no damages on person and properties were reported in these occurrences.

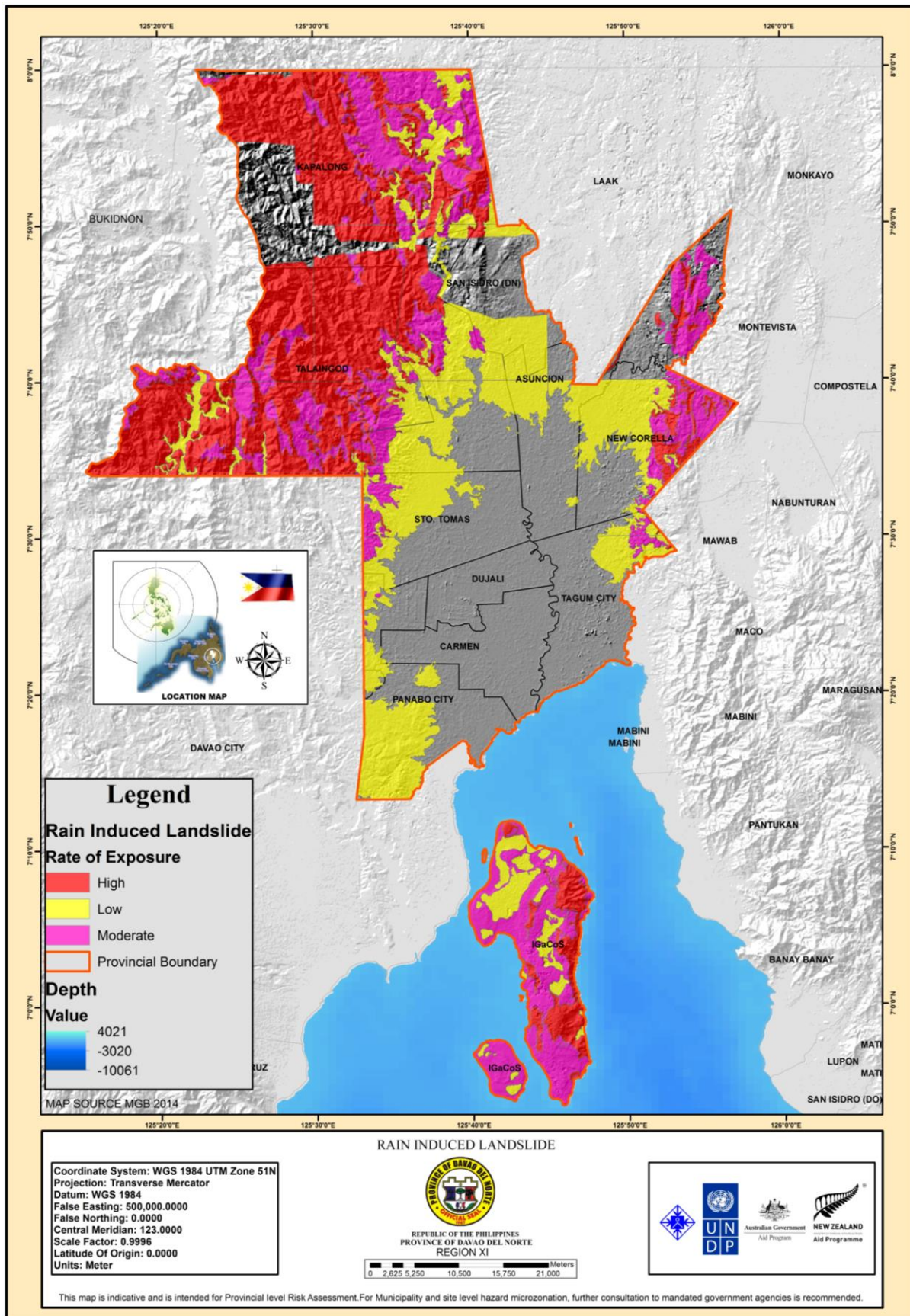
Table 3-29. Rain Induced Landslide Susceptibility Level, Davao del Norte

City/Municipality	Susceptibility in has.		
	High	Moderate	Low
Tagum City	56.00	843.90	3,309.10
Asuncion	1,296.80	3,946.70	12,433.00
New Corella	2,908.00	4,298.40	9,256.80
Kapalong	56,434.90	24,905.60	23,671.10
San Isidro	10,176.90	9,123.00	6,038.30
Talaingod	34,914.90	6,736.60	2,780.60
Island Garden City of Samal	6,314.45	15,562.29	5,742.96
Sto. Tomas	112.60	2,186.70	7,085.90
Panabo City		102.70	11,605.00
Carmen			558.90
<b>Davao del Norte</b>	<b>112,214.55</b>	<b>67,705.89</b>	<b>82,481.66</b>

Note: GIS generated data based on the MGB map



Map 20. Rain-Induced Landslide Map



## Earthquake and Earthquake-Induced Hazards

The Philippines being in the Pacific ring of fire is vulnerable to earthquake and earthquake-induced hazards. Ground shaking, earthquake-induced landslide and liquefaction are among the earthquake-induced hazard that has high probability of occurrence in Davao del Norte. Aside from these natural hazards, there are also man-made hazards such as water pollution, rock bursts, waste disposal, carbon emission, and global warming that complements the natural hazards and pose a threat to the province.

An earthquake is caused by the constant motion of the earth's surface. This motion creates buildup and releases energy stored in rocks at and near the earth surface. Earthquakes are the sudden, rapid shaking of the earth as this energy is released. Faults are fractures in the earth's surface where rock movement has taken place and earthquakes produced. Episodic movements along this "active" fault lines cause earthquakes with accompanying destruction of property and may be loss of life. Active faults that traverse the province of Davao del Norte are Mati Fault, Eastern Mindanao Fault and the Central Mindanao Fault. Very destructive earthquakes occur from fault movements occurring at less than 30 kms. Tsunamis are oftentimes generated if strong shallow earthquake occur under the sea and displace parts of the seabed.

Earthquake strength is measured in terms of either the magnitude or intensity. Magnitude measures the total energy released at the earthquake's point of origin (below the earth's surface) based on the information derived from a seismograph.

**Table 30. Earthquake Magnitude and Description**

Magnitude	Description
1	Not felt. Detected only by seismographs under favorable condition
2	Hardly perceptible. Detected by seismographs
3	"Very feeble". Felt only near the epicenter
4	"Feeble". Generally felt. But doesn't usually cause any damage
5	"Moderate" earthquakes. May cause local damages
6	"Strong" earthquakes. Usually cause local damages
7	"Major" earthquakes. Causes considerable, widespread damages. Maybe accompanied by surface fault rupture and tsunami
8	"Great" earthquakes. Potentially devastating
9	Rare earthquakes. Only five recorded since 1900

## Earthquake Occurrences

History of earthquake occurrences dates back as early as the 18th century. Data generated from PHILVOCS indicates that in the 20th century, Davao del Norte had experience earthquakes of different magnitude ranging from 4.6 to 7.3. The strongest earthquake that the province had experience was in 1893 when a 7.3 magnitude occurred in 21 June 1893 at 7:30 in the morning. The latest record was in January 2008 with a 4.5 magnitude. However, no data on the possible damage to lives and properties are obtained. The potential sources of these earthquakes are the three major fault lines

that traverse the province namely: Mati Fault, Eastern Mindano Fault and the Central Mindano Fault.

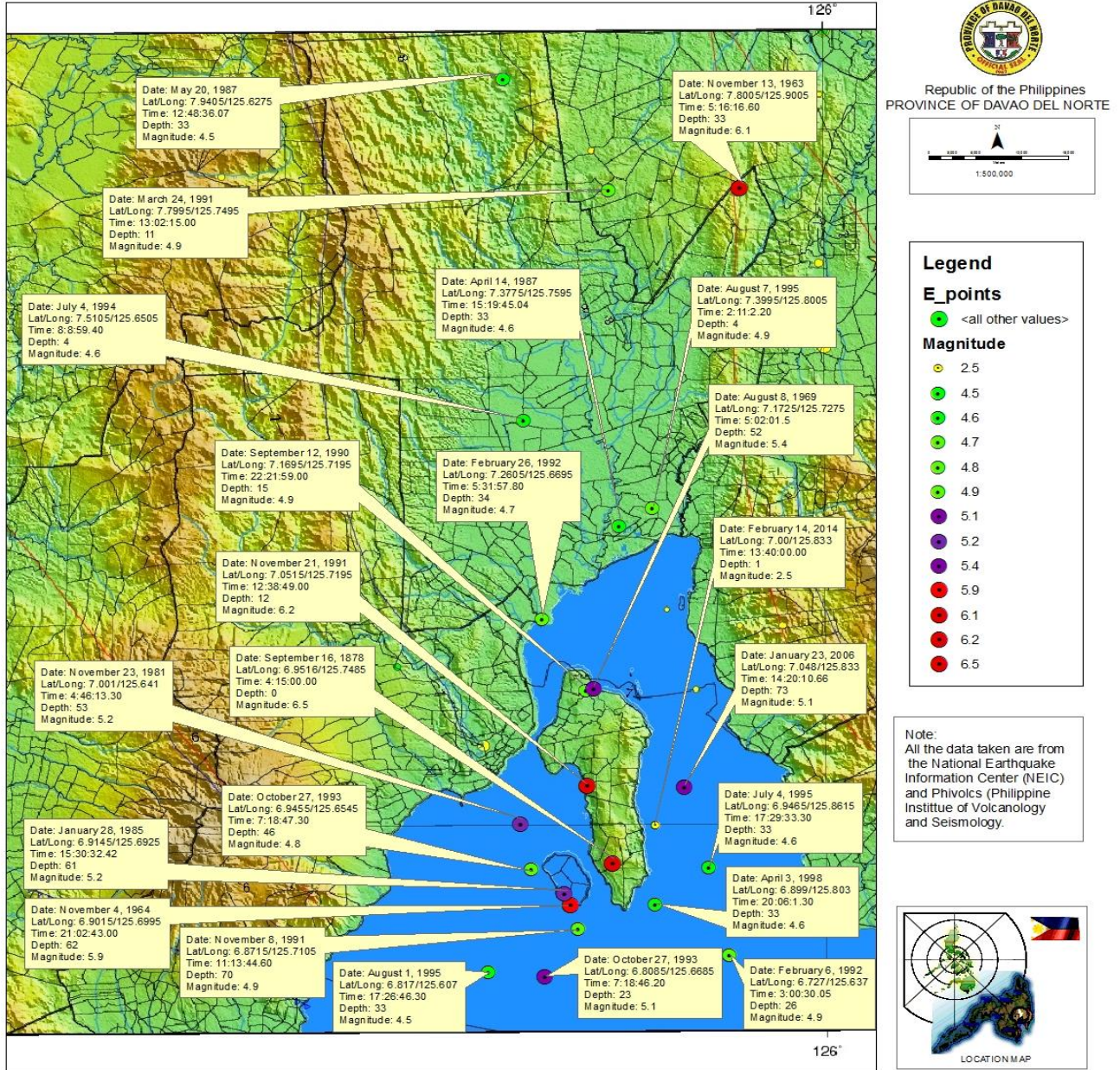
Mati Fault Line which emanates from the province of Davao Oriental passes through Compostela Valley and the Province of Davao del Norte. It crosses through the municipalities of New Corella and Asuncion. The Central Mindanao Fault Line on the other hand, negotiates from the Davao Gulf and passes through the City of Tagum all the way to the municipalities of New Corella and the eastern part of Asuncion. Historical data on earthquake occurrence is presented in Table 10.

**Table 31. Historical Data on Earthquake Occurrence  
Province of Davao del Norte**

Date of Occurrence	Time	Number of Occurrence	Frequency of Occurrence	Magnitude	Depthness (kms.)	Longitude	Latitude
1863 11 19	18 00 00.0	1	1	4.900000	4.900000	125.900000	7.250000
1867 02 23	21 15 00.0	2	1	4.700000	4.700000	125.950000	7.350000
1871 05 28	03 00 00.0	3	1	5.500000	5.500000	125.950000	7.250000
1891 06 24	19 42 00.0	4	1	7.200000	7.200000	126.000000	7.600000
1893 06 21	07 30 00.0	5	1	7.300000	7.300000	126.100000	7.650000
1956 12 27	21 31 28.00	6	1	5.500000	33.000000	126.100000	7.500000
1969 10 19	12 25 44.90	7	1	5.600000	58.000000	126.000000	7.700000
1969 10 19	12 25 45.10	8	1	5.700000	5.700000	125.994000	7.706000
1976 11 10	17 45 06.20	9	1	5.900000	5.900000	126.115000	7.848000
1977 11 17	19 16 05.50	10	1	4.700000	4.700000	126.095000	7.822000
1985 04 29	06 04 03.26	11	1	5.000000	5.000000	126.109000	7.300000
1987 08 09	06 44 31.83	12	1	5.000000	5.000000	125.729000	7.849000
1991 3 24	13 2 15.00	13	1	4.900000	11.000000	125.750000	7.800000
1991 4 26	17 37 4.20	14	1	6.000000	17.000000	126.150000	7.840000
1992 04 25	12 37 09.70	15	1	4.600000	4.600000	126.097000	7.191000
1992 5 24	20 37 54.90	16	1	4.500000	12.000000	126.100000	7.230000
1993 05 9	7 51 59.60	17	1	4.700000	4.700000	125.996000	7.918000
1993 10 8	5 16 29.90	18	1	5.000000	8.000000	126.290000	7.360000
1993 12 11	8 47 43.00	19	1	5.100000	18.000000	126.160000	7.540000
1994 1 22	11 18 1.30	20	1	4.800000	4.000000	126.030000	7.950000
1994 5 17	21 48 9.30	21	1	4.600000	7.000000	126.080000	7.920000
1994 11 6	11 53 11.60	22	1	5.700000	23.000000	125.930000	7.550000
1996 11 23	17 24 8.90	23	1	4.500000	9.000000	126.110000	7.680000
1997 04 14	6 17.80	24	1	4.600000	4.600000	126.120000	7.218000
2003 10 10	03 32 46.00	25	1	4.900000	135.000000	126.031000	7.339000
2004 05 16	11 01 16.69	26	1	5.700000	2.000000	126.055000	7.727000
2004 05 17	08 11 47.57	27	1	5.000000	1.000000	126.067000	7.708000
2008 01 07	18 25 04.51	28	1	4.500000	7.000000	126.250000	7.638000

Source: PHIVOLCS





Map 21  
EARTHQUAKE INCIDENCE SINCE 1878 TO 2014

## Ground Shaking

The main hazard event created by seismic earth movements is ground shaking. This term is used to describe the vibration of the ground during an earthquake. During an earthquake, seismic waves travel rapidly away from the source and through the earth's crust. Upon reaching the ground, they produce shaking that may last from seconds to minutes. The severity of the impact of ground shaking depends on a number of factors, including magnitude of the earthquake, distance from the rupture and the local geological conditions, which may either amplify or reduce the earthquake waves. One general observation is that damage is more severe for buildings founded on unconsolidated material than in rock.

Typically, the nearer one is from the epicenter, the greater is the magnitude of the intensity. As one moves farther from the origin, the intensity decreases.

The PHILVOCS Earthquake Intensity Scale (PEIS) provides descriptions of the consequences of earthquake. It also helps to explain the intensity assigned to a particular location based on the observations made on the consequences from the earthquake event. PEIS I indicates that the earthquake is scarcely perceptible, PEIS II is slightly felt, PEIS III is weak, PEIS IV is moderately strong, PEIS V is strong, PEIS VI is very strong, PEIS VII is destructive, PEIS VIII is very destructive, PEIS IX is devastating and PEIS X is very devastating.

Using the simulation parameters located at the Central Mindanao Fault with a magnitude of 7.2 with a depth of 2 km., with epicenter located at 125.75 longitude and 7.53<sup>0</sup> latitude using the site amplification assumption and wet season, ground shaking data/map is generated. The process generated information on areas that are prone to ground shaking as presented in Table 3-32.

Table 3-32. Areas Prone to Ground Shaking by Municipality, Davao del Norte

City/Municipality	Less Prone (in has.)	Prone (in has.)
Asuncion	0	15,854.400
B.E. Dujali	3,651.400	5,211.400
Carmen	10,278.400	6,409.700
Kapalong	61,426.300	29,365.100
New Corella	0	9,075.200
San Isidro	5,854.200	10,947.800
Sto. Tomas	11,233.300	10,330.800
Talaingod	35,631.200	26,010.300
IGaCoS	15,490.200	12,496.500
Panabo City	24,378.700	0
Tagum City	187.300	18,346.600



### Earthquake –Induced Landslides

Most moderate and large earthquakes trigger landslides, and these landslides commonly account for a significant portion of total earthquake damage and injuries. Among the many causes of landslides, those triggered by earthquake and heavy rainfall are the most common throughout the country. Thus, formulating scenarios where earthquake-induced landslides are likely to occur can help local authorities plan emergency response and mitigate landslide risk.

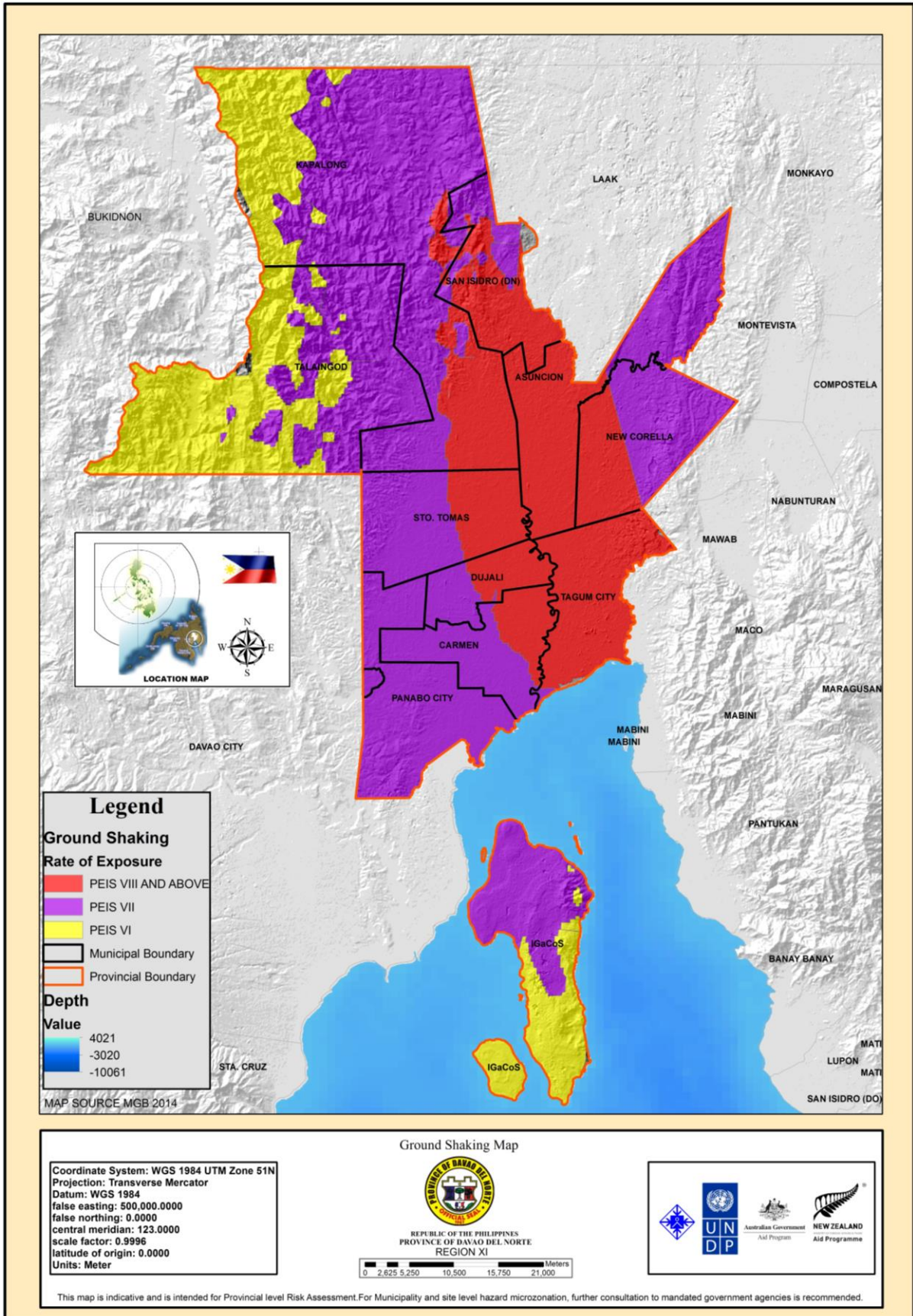
Although there are no recorded incidents of earthquake-induced landslide in Davao del Norte, however due to the presence of fault lines traversing the province, the event will become evident due to the topographic characteristics of the province. Using GIS and the available data from PHILVOCS, the simulation conducted indicates that the municipality of Kapalong has the widest area of 320.1038 square kilometers with high exceedance to earthquake-induced landslide. Other localities that are prone to earthquake-induced landslide are Talaingod, San Isidro and New Corella. Table 12 below shows the areas in Davao del Norte that are susceptible to earthquake-induced landslides.

Table 3-33. Earthquake-Induced Landslide Susceptibility  
Province of Davao del Norte

City/Municipality	Exceedance (in has.)				Total
	No	Low	Moderate	High	
Asuncion				249.130	249.130
Kapalong			19,434.610	32,010.380	51,444.990
New Corella				2,267.21	2,267.21
San Isidro				5,291.880	5,291.880
Talaingod			20,602.180	19,297.900	39,900.080
Island Garden City of Samal		1,451.990			1,451.990
Davao del Norte		1,451.990	40,036.790	59,116.500	100,605.280

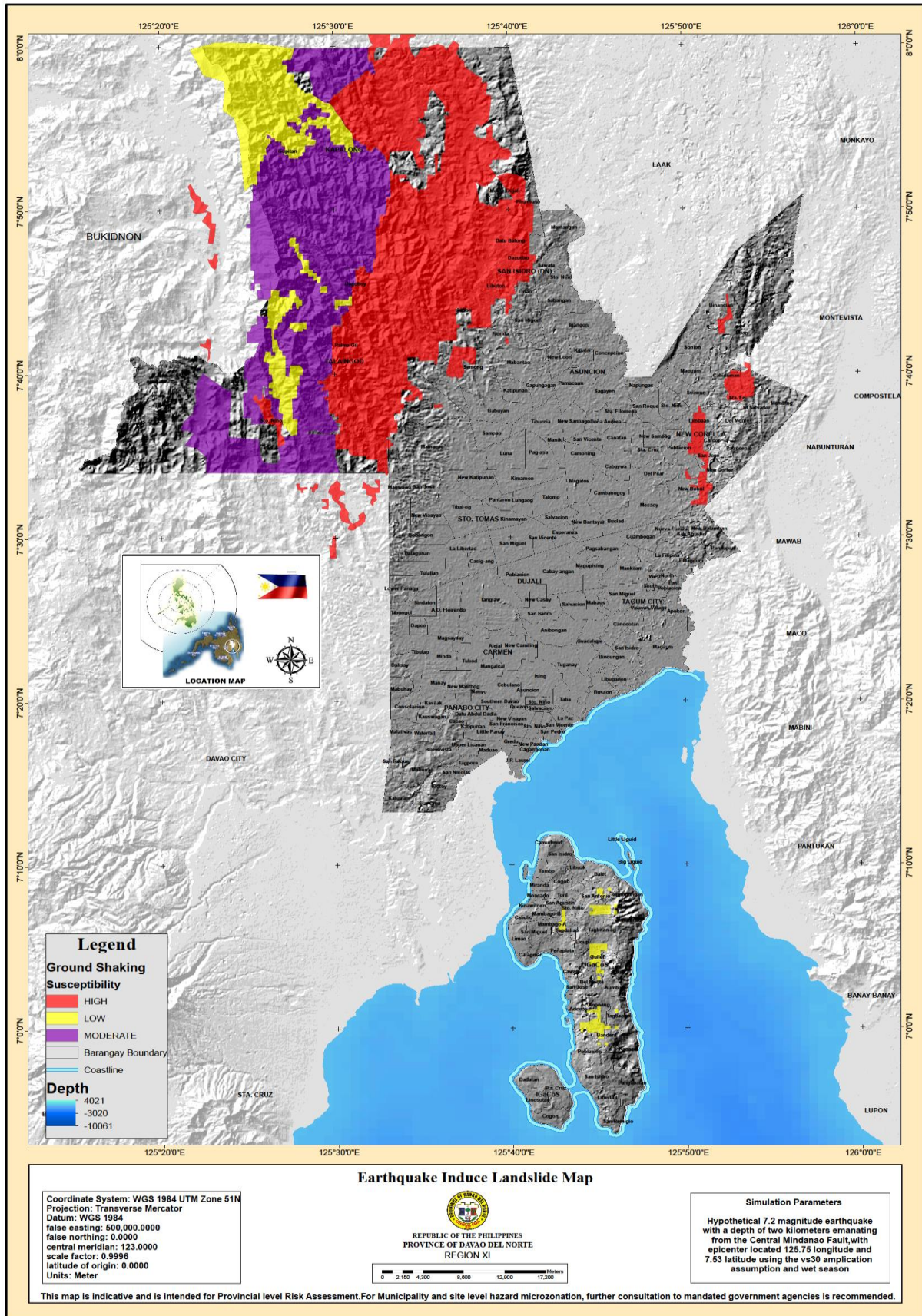
Source: GIS generated data from MGB map

Map 22. Ground Shaking Map, Davao del Norte





Map 23. Earthquake-Induced Landslide Map, Davao del Norte



## Liquefaction

Soil liquefaction describes a phenomenon whereby a saturated or partially saturated soil substantially loses strength and stiffness in response to an applied stress, usually earthquake shaking or other sudden change in stress condition, causing it to behave like a liquid.

Liquefaction is a process where particles of loosely-consolidated and water-saturated deposits of sand are rearranged into a more compact state. This results in the squeezing of water and sediments towards the surface in the form of “sand fountain” and creating a condition resembling to a “quicksand”. In this phenomenon, the strength of the soil is reduced to a point where it is unable to support structures.

Liquefaction commonly occurs in areas that are water saturated (shallow water table), low-lying and situated in typically loose (unconsolidated) foundation or in sandy or silty deposits. Typical examples of these areas are river banks, abandoned rivers, flood plains, coastlines and swamps.

There are no reported liquefaction occurrences in the Province. However, zones of different liquefaction potential were derived based on the geomorphological analysis. Tagum City and the municipality Sto. Tomas and Asuncion are the top three LGUs with areas highly susceptible to liquefaction. But in terms of the area susceptibility against the total land area, 97.39 percent of the municipality of B.E Dujali is highly susceptible to liquefaction. The other municipalities have either low or moderate susceptibility. The Island Garden City of Samal has no areas susceptible to liquefaction. Detail of liquefaction hazard susceptibility is presented in Table 3-24.

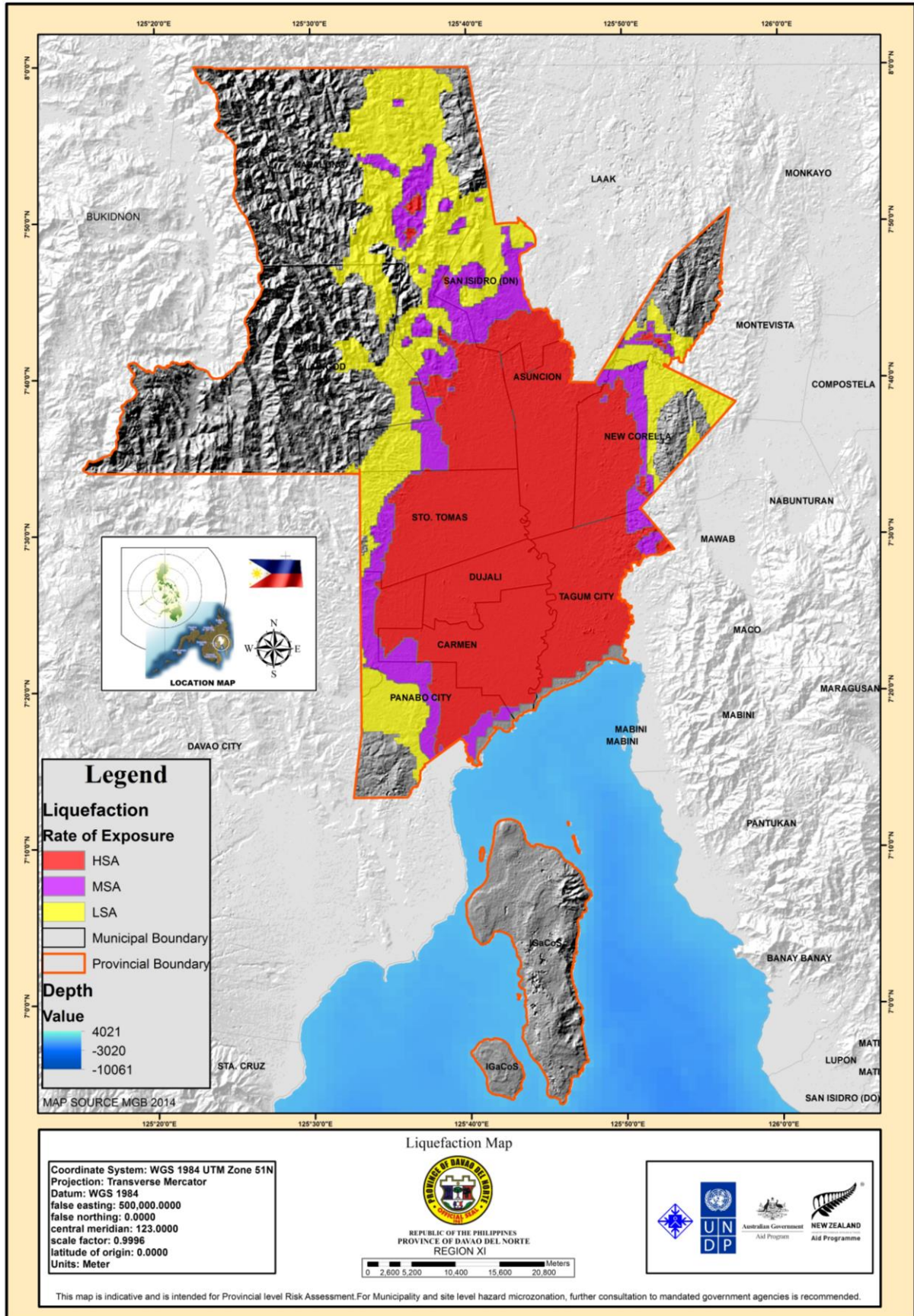
Table 3-24. Liquefaction Hazard Susceptibility, By Municipality

Municipality	SUSCEPTIBILITY LEVEL			
	High Susceptibility Area (in has.)	Moderate Susceptibility Area (in has.)	Low Susceptibility Area (in has.)	Total (has.)
Asuncion	16,055.525	1,346.893	0	17,402.418
B.E. Dujali	8,862.888	0	0	8,862.888
Carmen	14,831.023	1,028.509	587.335	16,446.866
Kapalong	12,351.134	9,534.142	27,461.984	49,347.260
New Corella	10,585.822	3,263.589	5,018.269	18,867.680
San Isidro	4,073.579	5,655.990	6,566.275	16,295.844
Sto. Tomas	16,890.678	1,698.538	2,817.279	21,406.494
Talaingod	66.029	658.630	6,334.013	7,058.671
IGACOS	0	0	0	0
Panabo City	7,788.459	5,891.859	5,297.770	18,978.087
Tagum City	17,086.668	1,187.556	0	18,274.224
Total	108,591.804	30,265.704	54,082.924	192,940.432

Source: GIS Generated data from MGB map



Map 24. Liquefaction Map, Davao del Norte





## Storm Surge

Storm surge is a rise in sea level that occurs during tropical cyclones, intense storms also known as typhoons or hurricanes. The storm produces strong winds that push the water into shore, which can lead to flooding. This makes the storm surge very dangerous for coastal areas.

In general storm surge occurs where winds are blowing onshore. The highest surge tends to occur “near the radius of maximum winds,” or where the strongest winds of the typhoon occur.

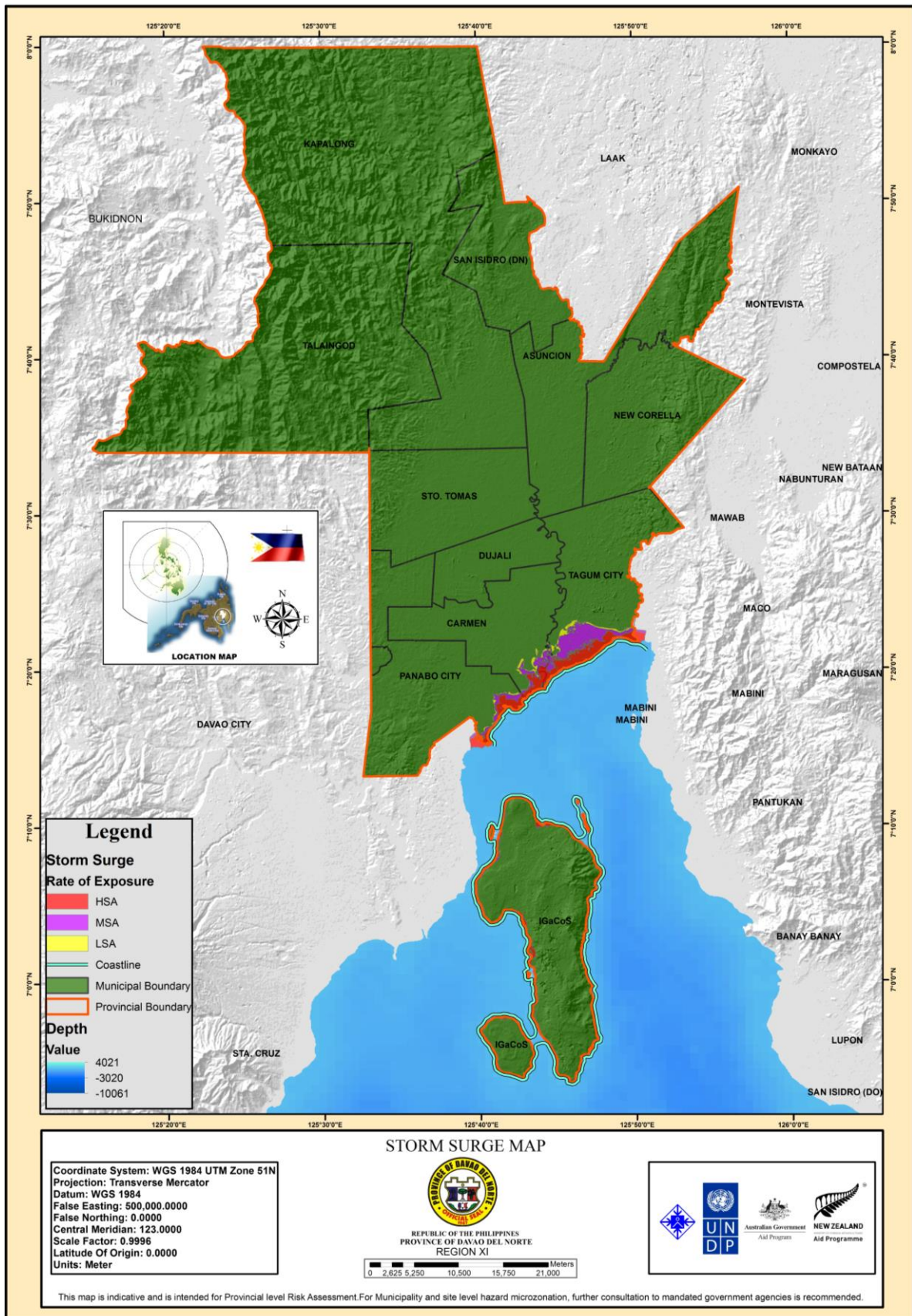
There are no reported storm surge occurrences in Davao del Norte. However, to determine the effect of the storm surge and the extent of flooding if so ever it occurs in the province, a simulation using the worst case scenario (5 meter surge) is done through GIS. The result of the simulation is presented in Table 3-35 and on Map No. 25.

Table 3-35: Storm Surge Susceptibility Area  
Province of Davao del Norte

City/Municipality	Barangay	Susceptibility Level		
		HIGH (in has.)	MODERATE (in has.)	LOW (in has.)
Carmen	Lapaz	234.662	76.126	68.387
	Taba	452.188	344.722	71.327
	Tuganay	57.341	256.947	97.699
	Guadalupe		14.579	40.189
	Ising		30.55	37.502
	Sto. Nino		6.843	21.436
<i>Total</i>		<i>744.191</i>	<i>729.767</i>	<i>336.54</i>
IGACOS	Adecor	106.814	8.066	2.64
	Audanao	0.215	0.127	0.08
	Balet	37.901	3.731	1.255
	Caliclic	30.531	6.879	1.717
	Camudmud	28.691	4.611	1.869
	Catagman	6.895	2.158	1.349
	Cawag	9.351	0.32	0.04
	Cogon	20.926	2.087	0.92
	Dadatan	9.903	1.401	0.492
	Kinawitnon	12.246	3.441	1.629
	Libertad	13.393	1.994	0.84
	Libuak	60.905	6.413	3.065
	Limao	29.776	5.955	1.762
	Linusutan	12.148	1.685	0.6
Miranda	24.611	9.024	2.928	

	Moncado	36.212	6.075	1.09
	Penaplata	61.701	5.607	1.52
	Poblacion	31.655	4.555	1.273
	San Isidro	14.052	1.685	0.686
	San Jose	28.47	2.28	0.623
	San remegio	12.77	1.866	0.44
	Sta. Cruz	9.197	0.906	0.28
	Tambo	27.92	3.605	1.339
<i>Total</i>		<i>626.283</i>	<i>84.471</i>	<i>28.437</i>
Tagum City	Bincungan	467.714	339.885	73.928
	Busaon	739.261	156.332	26.747
	Libuganon	383.137	88.273	0.091
	Madaum	1,005.257	202.527	74.279
	San Isidro	254.682	194.774	81.398
	Canocotan		0.955	6.593
<i>Total</i>		<i>2,850.05</i>	<i>981.791</i>	<i>256.443</i>
Panabo City	Cagangohan	111.66		
	Gredu		1.249	1.304
	J.P. Laurel	316.965	73.103	27.753
	New Pandan	55.884	42.724	9.162
	San Francisco	7.171	36.127	21.459
	San Pedro	308.06	25.664	6.482
	San Vicente	140.667	18.635	9.741
	Sto. Nino	180.556	38.582	15.168
<i>Total</i>		<i>1120.963</i>	<i>236.084</i>	<i>91.069</i>

Map 25. Storm Surge Map, Davao del Norte



### Impacts/Implications of Hazards

- Reduction in rainfall during the summer season will result in water shortage. Irrigation water for farms will be less affecting food production. Water level in dams will be low affecting energy production.
- Heavy rains during the wet season creates flooding affecting economic activities, damages to physical assets and the worst, fatalities, injuries and illnesses.
- Moreover, increase in temperature and variability in rainfall will affect the growth and development of plants and animals in the forest. Some forest plants and wildlife species may not survive.
- Changes in temperature and rainfall intensity, frequency and distribution affect the growth and yield of climate sensitive crops and fruit trees. It will trigger also the spread of pests and diseases of both plants and animals.
- Floods brought by typhoons or heavy rains due to LPA also damage critical infrastructures and lifelines affecting access and mobility and provision of social services.
- Drought will seriously affect crop production while heat stress will increase mortality of poultry and livestock. Sea surface temperature will affect fishery. Fish will move out to cooler and deeper water making it difficult to reach and catch them by marginal fishermen.
- Increased frequency and intensity of rainfall in some areas will produce more pollution and erosion and sedimentation due to runoff
- Flooding can affect water quality, as large volumes of water can transport contaminants into water bodies and also overload storm and wastewater systems

## 4.0 Economy

### 4.1 Economic Structure

#### 4.1.1 Internal Context

The economy of the province is based in agriculture. Vast tracks of land are devoted to agricultural production of staple and industrial crops. Consolidating the production incomes would indicate that it is so. Table No. 3-36 shows the incomes generated by LGU from the major sectors, such as agriculture, industries, services, wood, quarrying and tourism.

*Table No.3-36 : Provincial Income from Major Sources in Php (Million),  
By City/Municipality: CY 2013 Province of Davao del Norte*

LGU	Agriculture	Industries *	Services *	Wood	Quarrying	Tourism	Total
Tagum	2,085.00	4,109.00	1,368.59	257.60	121.64	625.94	8,567.77
New Corella	1,675.00	240.618	6.19	7.75	0.13	201.59	2,131.28
Asuncion	1,636.00	958.409	2.86	5.70	0.44	1.79	2,605.20
Kapalong	2,141.00	534.209	552.54	23.12	24.59	34.32	3,309.78
Talaingod	635.00	0.37	0.53	23.75	120.00	3.59	783.24
San Isidro	1,319.00	42.69	0.89	7.05	-	0.15	1,369.78
Panabo City	5,072.00	3,476.00	84.95	215.66	5.22	54.82	8,908.65
Sto. Tomas	5,520.00	-	-	4.46	6.45	75.96	5,606.87
Carmen	2,601.00	237.77	326.73	61.06	22.65	38.33	3,287.53
BE Dujali	1,761.00	122.45	122.25	-	-	0.55	2,006.26
IGCSamal	2,434.00	18.87	18.97	25.30	-	1,314.00	3,811.14
Davao del Norte	26,879.00	9,740.39	2,484.50	631.45	301.11	2,351.04	42,387.49
% Share	63.41	22.98	5.86	1.49	0.71	5.55	100.00

Source : Agriculture – Provincial Agriculturist's Office & Bureau of Agricultural Statistics

Industry and Services - Department of Trade and Industry

Wood and Quarrying - Dept. of Environment and Natural Resources & PENRO-LGU

Tourism – Provincial Information Office – Tourism Office

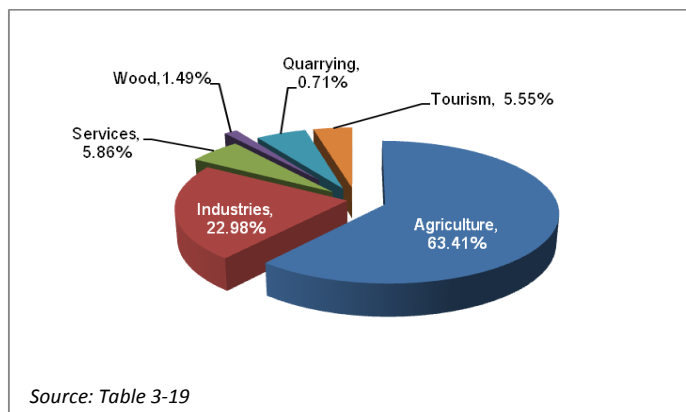
#### Notes:

1. Data considered for Industries and Services Sectors are record on investments in Php Millions. Information on income from the said sectors are not being disclosed by concerned entities.
2. Data presented in Table No. 1 is derived from computing actual production and prices as of 2013.
3. Dash in the cell indicates that data is not available.



It can be gleaned that agriculture is contributing most of the provincial income accounting for a total of P 26,879.00 billion in 2013. This is followed by industries sector with P9,740.39 billion; then the services sector with P 2,484.50 million and tourism sector with P 2,351.04 million. The investments reflected for the industries sector include all industries' capitalization which

Figure No. 8. Provincial Income from Major Sources in Php Millions



was monitored by the Board of Investments, the Department of Trade and Industry, Securities Exchange Commission and other authorized entities.

Joint probability refers to the shares in provincial income of major sectors. Table No. 3-37 below shows the percent contribution of each LGU for every sector performance to the over-all production and income performance of the province.

Table No. 3-37. **Joint Probability: Provincial Income from Major Sectors of Cities and Municipalities for CY 2013 Province of Davao del Norte**

LGU	Agriculture	Industries	Services	Wood	Quarrying	Tourism	Total
Tagum	4.92	9.69	3.23	0.61	0.29	1.48	20.21
New Corella	3.95	0.57	0.01	0.02	0.00	0.48	5.03
Asuncion	3.86	2.26	0.01	0.01	0.00	0.00	6.15
Kapalong	5.05	1.26	1.30	0.05	0.06	0.08	7.81
Talaingod	1.50	0.00	0.00	0.06	0.28	0.01	1.85
San Isidro	3.11	0.10	0.00	0.02	-	0.00	3.23
Panabo City	11.97	8.20	0.20	0.51	0.01	0.13	21.02
Sto. Tomas	13.02	-	-	0.01	0.02	0.18	13.23
Carmen	6.14	0.56	0.77	0.14	0.05	0.09	7.76
BE Dujali	4.15	0.29	0.29	-	-	0.00	4.73
IGCSamal	5.74	0.04	0.04	0.06	-	3.10	8.99
Totals	63.41	22.98	5.86	1.49	0.71	5.55	100.000

Note : Computed data are based on Table No. 3-19

From the said table, the top four LGU income generators across sectors are Panabo City (21.02%), Tagum City (20.21%), Sto. Tomas (13.23%) and the Island Garden of Samal (8.99%).

About 63.41% of the total income generated by the province comes from agricultural production, while 22.98% is contributed by the industries sector followed by the 5.86% from the services sector. Tagum City consistently holds its position as the trading and

service capital of Davao del Norte contributing 9.69% for the industry sector and 3.23% for the service sector.

The top four income generators across sectors based on over-all income performance are Panabo City, Tagum City, Sto. Tomas and the Island Garden City of Samal. While the municipalities of Talaingod and San Isidro have the least contributions to the over-all income.

As to major sources of income Tagum City ranks first in industry, services, wood and quarrying sectors. On the other hand, Sto. Tomas and Panabo City are top contributors to agriculture sector. While the Island Garden City of Samal leads the tourism sector.

#### **4.1.2 Patterns of industry concentration and specialization**

Industry concentration occurs when the presence of an industry in an LGU, which is measured in this terms of production value and income is greater than if the industry was distributed evenly across the entire province.

Looking into the industry concentration by sector, the municipality of Sto. Tomas ranks first with 20.54% share to agriculture. It is followed closely by Panabo City with 18.87% share. On the other hand, Tagum City takes the lead contribution to industry, services, wood and quarrying sectors. Meanwhile, tourism industry remains the domain of the Island Garden City of Samal where foreign and local tourists flock for those natural attractions, pristine beaches and rustic sites. Table No.3-38 below provides detailed information on the concentration of provincial income from major sectors.

*Table No.3-38. Concentration of Provincial Income from Major Sources  
By City and Municipality as of CY 2013  
Province of Davao del Norte*

<b>LGU</b>	<b>Agriculture</b>	<b>Industries</b>	<b>Services</b>	<b>Wood</b>	<b>Quarrying</b>	<b>Tourism</b>
Tagum	7.76	42.19	55.09	40.79	40.40	26.62
New Corella	6.23	2.47	0.25	1.23	0.04	8.57
Asuncion	6.09	9.84	0.12	0.90	0.15	0.08
Kapalong	7.97	5.48	22.24	3.66	8.17	1.46
Talaingod	2.36	0.00	0.02	3.76	39.85	0.15
San Isidro	4.91	0.44	0.04	1.12	-	0.01
Panabo City	18.87	35.69	3.42	34.15	1.73	2.33
Sto. Tomas	20.54	-	-	0.71	2.14	3.23
Carmen	9.68	2.44	13.15	9.67	7.52	1.63
BEDujali	6.55	1.26	4.92	-	-	0.02
IGCSamal	9.06	0.19	0.76	4.01	-	55.89
Totals	100.00	100.00	100.00	100.00	100.00	100.00

*Note : Computed data are based on Table No.3-19*

Industry specialization is a method of production where an area focuses on the production of a limited scale of products and services in order to gain a greater degree

of productive efficiency within the entire area. Most countries specialize in producing goods and services that are native to them. Few countries produce enough goods to be completely self-sufficient so that specialization becomes the basis of trade.

In the case of the province of Davao del Norte, agriculture predominates all other sectors in all cities and municipalities with the exception of Tagum City. As the capital of Davao del Norte, it is shifting its economic activity from agriculture to industries and services. The following table presents the information on the contribution of every sector in income generation for cities and municipalities of Davao del Norte.

*Table No.3-39. Specialization of Provincial Income by Major Sources in Percent Share  
By City and Municipality, as of CY 2013  
Province of Davao del Norte*

Municipality/ City	Agriculture	Industries	Services	Wood	Quarrying	Tourism	Total
Tagum	24.34	47.96	15.97	3.01	1.42	7.31	100.00
New Corella	78.59	11.29	0.29	0.36	0.01	9.46	100.00
Asuncion	62.8	36.79	0.11	0.22	0.02	0.07	100.00
Kapalong	64.69	16.14	16.69	0.70	0.74	1.04	100.00
Talaingod	81.07	0.05	0.07	3.03	15.32	0.46	100.00
San Isidro	96.29	3.12	0.06	0.51	-	0.01	100.00
Panabo City	56.93	39.02	0.95	2.42	0.06	0.62	100.00
Sto. Tomas	98.45	-	-	0.08	0.12	1.35	100.00
Carmen	79.12	7.23	9.94	1.86	0.69	1.17	100.00
BE Dujali	87.78	6.10	6.09	-	-	0.03	100.00
IGCSamal	63.87	0.50	0.50	0.66	-	34.48	100.00

*Note : Computed data are based on Table No. 3-19*

It can be noted from this table that the contribution of income from agriculture sector is at varying levels in every LGU. The Island Garden City of Samal only derives its income from the said sector by 63.87% because part of the income that it generated comes from the tourism sector. Other sectors such as trading and services are considered developing and thriving in every LGUs however, these sectors are contributing to the local economy. Although their contributions are much smaller in scale, they are supportive to the existence and growth of major sectors in the economy.

#### **4.1.3 Description of basic sectors in Agriculture**

##### **a. Crops Production**

Of the 346,280 hectares total land area of the province 195,511.55 hectares or 56.46% are devoted to agricultural production. Table 3-40 indicates the major crops in the province and their production output. These include paddy rice, corn, coconut, banana for export and local consumption, fruit trees, and some high valued commercial and industrial crops. Vegetables, root crops and other temporary and perennial crops are also grown, although only in patches and not in contiguous areas.

In terms of production value, Cavendish banana is the largest contributor in agriculture accounting for 66% or P14,177 Billion in an area of 31,485 hectares. The crop is mostly grown in plantation scale with major companies undertaking export operations. The industry also generates income from its rejects converting it into banana chips (food and/or feed grade) and organic fertilizer (from peelings).

As to land area planted, coconut is the dominant crop grown in the province. Some 42,294.97 hectares are devoted to coconut production. The Island Garden City of Samal devotes the largest area for coconut production at 16,105.25 hectares, contributing 38% of the total area planted to coconut in the Province while contributing P4,487 Billion or 21% to the agriculture's production value of the province.

Paddy rice cultivation is undertaken in 18,566.11 hectares of which 79.12 % or 14,690 hectares are potentially irrigable. Rice is grown in all municipalities and cities however, 93% of the total rice area equivalent to 17,344.75 hectares is concentrated only in 6 municipalities. These are Sto. Tomas, Carmen, Asuncion, New Corella, BE Dujali and Kapalong with Sto. Tomas having the largest rice production area.

Mono-crop cultivation of corn is around 8,475.30 hectares which are usually planted with the white variety. Corn is produced in sizeable areas in 4 municipalities namely, Kapalong, New Corella, Talaingod and Asuncion accounting for 87% (7,386.75 hectares) of the total area. There are also areas grown with corn and being intercropped with other commodities like local banana and under coconut trees.

Fruit tree growing is also feasible in the province. Two banner fruit tree crops with export potentials are being promoted for commercial and orchard production because of strong tendencies for income generation. These are the durian and mango. Durian is highly suitable for production in the province because of its terrain and climatic condition. Mango is highly suitable in some areas with soil type of corraline limestone origin (Bolinao clay) as typically found in the Island Garden City of Samal, some parts of Panabo City and some upland areas in the mainland. Mango and durian are grown in 4,886 and 935 hectares, respectively.

In addition to coconut and mango, other crops identified as priority commodities of the region such as cardava banana, cassava, coffee, rubber, oil palm and abaca are also being grown in the province.

*Table No. 3-40: Agriculture Profile  
Province of Davao del Norte  
As of CY 2013*

Commo- dities (has.)	Municipalities/ Cities											Totals
	District I						District II					
	Tagum	New Corella	Asuncion	Kapalong	San Isidro	Tala- ingod	Sto. Tomas	Panabo	Carmen	BE Dujali	IGaCoS	
Paddy rice												
Irrigated												
Rain fed	412	1,255	2,032	1,090	35	85	4,227	138	3,123	2,218	76	14,691
Subtotal	67	1,470	850	703	227	115	233		143	67		3,875
	479	2,725	2,882	1,793	262	200	4,460	138	3,123	2,361	143	18,566
Corn	90	1,905	969	2,763	330	1,750	113	213	43	0	300	8,476
Coconut	6,348	2,830	2,300	655	3,894	1,139	276	4,922	3,710	116	16,105	42,295
Banana:												
Cavendish	2,291	1,500	1,058	3,204		131	10,180	8,766	2,124	2,230		31,484
Cardava	304	1,354	1,255	748	2,881	701	253	1,200	138	64	1,319	10,217
Other cul.	290	2,000	1,547	3,172	1,978	328	369	1,270	476	55	2,776	14,261
Subtotal	2,885	4,854	3,860	7,124	4,859	1,160	10,802	11,236	2,738	2,349	4,095	55,962
Mango	52	40	70	398	308	10	350	850	61	29	2,718	4,886
Durian	255	232	20	70	207	20	9	70	31	16	5	935
Coffee	32	187	15	33	8	531	60	98	1		39	1,004
Cacao	34	351	305	1,200	4,061	37	201	74	7	3	34	6,037
Vegetable & Spices	27	60	142	7	23	9	73	50	10	0	90	491
Cassava	30	4	145	33	2	27	20	50			38	349
Other rootcrops	10	0	8	15	0	20	13	30	5	5	11	85
Rubber	13	331	50	669	191	949	434	111	3	3		2,754
Oil Palm		30	20	325	6	26	19	42	16	10		494
Abaca				7		1,065	15					1,087
Other crops	3,498	12,007	11,723	12,924			10,429	4,522	5,674	3,688	282	64,747
<b>TOTAL</b>	<b>13,753</b>	<b>25,556</b>	<b>22,509</b>	<b>28,017</b>	<b>14,152</b>	<b>6,942</b>	<b>27,763</b>	<b>22,389</b>	<b>15,421</b>	<b>8,575</b>	<b>23,860</b>	<b>195,512</b>

Source: Municipal/City LGUs  
Provincial Agriculturist's Office

With regards to production as presented in Table 3-41, rice production averages 122,789 metric tons (dry basis) in 2013, in an average harvested area of 32,781 hectares (two cropping seasons at the average). Irrigated rice comprises 91% of the production areas, and where most of the production of paddy rice (palay) came from. Average yield was around 3.57 metric tons (dry basis), or at an average of 75 bags of 50 kilograms in a hectare. Paddy rice production is estimated to value at P1,927.79 Million at farm gate price.

Among the local banana varieties, cardava also contributed much to the economy. Cardava bananas are processed into chips and sold in local markets and for export. Many banana chips processing plants are being put up, particularly in Tagum and Panabo Cities. Chips undergo two- stage frying, before products are sold for human consumption. There are other forms of raw banana being processed into products as sold; dried banana chips from Cavendish banana that fail the quality standards, processed into animal feeds and pastes extenders (for plywood, etc.) and banana



peelings (from cardaba banana chips) are processed into animal feeds and organic fertilizers. Their values however, were not immediately available for quantification.

Production of vegetables and root crops, although generally not grown in plantation scale, contributes around P 183 million annually to the Province's economy at their farm gate values.

**Table No.3-41: Crop Area, Production, Average Yield, and Value of Production, By Crop, Davao del Norte, CY 2013**

Crops/ Commodity	Area Harvested (Has.)	Annual Production (MT)	Average Yield (MT/Has.)	Farm Gate Price (2013, PhP)	Estimated Value (2007 farm gate price), PhP, Million
Rice	32,781	122,789	3,75	15.70	1,927.79
Irrigated	29,775	112,049	3.76	15.70	1,759.17
Rain fed	3,006	10,740	3.57	15.70	168.62
Corn	15,172	20,697	1.36	12.60	260.78
White	10,532	10,308	0.98	12.60	129.88
Yellow	4,640	10,389	2.24	12.60	130.90
Coconuts	38,084	228,096	5.84	19.67	4,486.65
Banana					
Cavendish	28,564	1,484,529	51.97	9.55	14,177.26
Saba/Cardaba	4,356	47,720	10.96	8.38	399.90
Other cultivars	1,358	12,213	8.99	15.55	202.12
Mango	1,542	2,717	1.76	20.00	54.34
Durian	2,327	12,511	5.38	24.36	304.78
Coffee	1,098	1,134	1.03	56.77	64.36
Cacao	1,045	372	0.36	58.98	21.93
Vegetables & spices	1,810	6,693			85.39
Cassava	453	3,116	6.88	3.33	10.38
Other rootcrops	788	4,095			50.34
Rubber	581	1,112	1.91	39.17	43.55
Abaca	130	233	1.80	35.32	8.24

Source: Bureau of Agricultural Statistics, Davao del Norte

Notes: \* - retail prices

\*\* - estimated value of copra (coconut) meat

In cereals production, the statistics for the last four years (2010- 2013) is illustrated in Table No. 3-42. Rice production, in general, increased by 3.42% annually. This resulted from the 2.43% increase of production from irrigated areas where most of the production came from and 16.91% increase in rain fed areas. Records show that irrigated areas used for rice production increased at the rate of 3.93% and rain fed areas increased by 9.3%.

Corn production however, as shown in the same table, showed a decrease both in production and production areas. Total production decreases by 4.19% annually but yellow corn demonstrates a positive increase at a rate of 4.07%. Negative growth of 4.14% is also manifested in the production areas but yellow corn areas posted positive growth rate of 2.76%.

*Table No. 3-42 Production Data for Rice and Corn  
Davao del Norte, 2010- 2013*

Commodities	2010	2011	2012	2013	AAGr, %
<b>RICE:</b>					
A. Production, MT palay					
Irrigated	104,274	108,480	125,155	112,049	2.43
Rain fed	6,721	7,313	8,316	10,740	16.91
Total	110,995	115,888	133,471	122,789	3.42
B. Area Harvested, Has.					
Irrigated	26,524	29,099	30,329	29,775	3.93
Rain fed	2,302	2,347	2,724	3,006	9.30
Total	28,826	3,155	33,053	32,781	4.38
<b>CORN:</b>					
A. Productions, MT grains					
White	14,313	11,514	12,820	10,308	(10.36)
Yellow	9,218	11,081	8,878	10,389	4.07
Total	23,531	22,595	34,468	20,697	(4.19)
B. Area Harvested, Has.					
White	12,947	11,398	11,672	10,532	(6.65)
Yellow	4,276	4,535	3,865	4,640	2.76
Total	17,223	15,933	15,537	15,172	(4.14)

*Source: Bureau of Agricultural Statistics, Davao del Norte  
AAGr- Average Annual Growth Rates*

## **b. Livestock and Poultry Production**

Livestock production is being undertaken in all cities and municipalities mostly in backyard scale. The municipality of Carmen is the highest contributor in terms of production particularly in cattle and hog production, while the municipality of San Isidro is the highest producer of carabao. In the overall, the livestock and poultry industry contributes Php 4,443 Billion to the province's economy.

*Table 3-43: Livestock and Poultry Production  
Province of Davao del Norte: CY 2013*

Municipality/ City	Livestock production, in metric tons				
	Carabao	Cattle	Hogs	Goat	Poultry
<b>District I:</b>					
Tagum City	73.97	144.56	1,343.46	89.90	359.04
New Corella	115.06	82.05	762.50	51.03	359.04
Asuncion	230.11	238.32	2,214.89	148.22	359.04
Kapalong	205.46	117.21	1,089.29	72.89	334.88
Talaingod	24.66	156.28	1,452.39	97.19	334.88
San Isidro	567.07	312.55	2,904.77	194.38	359.04
<b>District II</b>					
Panabo City	41.09	140.65	1,307.15	87.47	357.03

Sto. Tomas	180.80	183.63	1,706.55	114.20	357.03
Carmen	361.61	464.93	4,320.85	289.14	359.04
B.E Dujali	271.21	175.81	1,633.93	109.34	357.03
IGACOS	73.97	293.02	2,723.22	182.23	334.88
<b>TOTALS</b>	<b>2,145</b>	<b>2,309</b>	<b>21,459</b>	<b>1,436</b>	<b>3,870.9</b>

Source: Bureau of Agricultural Statistics, Davao del Norte

- Poultry production includes meat & eggs for chicken & duck

### c. Fish Production

There are two types of fishing in Davao del Norte namely, municipal fishing and aquaculture. Fishing in municipal waters includes marine and inland fishing, while aquaculture includes brackish water and fresh water fishponds.

Aquaculture utilizes about 2,022.21 hectares land area. Brackish water fishpond has nearly salty water that is ideal for raising bangus (*Chanos chanos*), shrimps, crabs and other species. Fishponds of this type are found along the coasts of Tagum City, Panabo City and the Island Garden City of Samal. It dominates the aquaculture industry at 1,571.65 hectares (Table No. 3-44). On the other hand, fresh water or inland fishponds produce tilapia (*Oreochromis niloticus*) and catfish (*Clarias garofinus*). These fishponds are thriving in all LGUs except Tagum City. The Island Garden City of Samal and the municipalities of Carmen, Braulio E. Dujali and Asuncion have large fresh water fishponds. Inland water bodies like water impoundments and water logged areas are presently developed for the aquaculture industry using net cages.

Table No. 3-44 : Aquaculture Profile of Davao del Norte, CY 2013

Municipality/ City	Fishpond Category					
	Brackish		Freshwater		Total	
	Area, Ha.	No. of Farmers	Area, Ha.	No. of Farmers	Area, Ha.	No. of Farmers
District I						
Asuncion			25.10	38	25.10	38
Kapalong			5.00	50	5.00	50
New Corella			3.86	24	3.86	24
San Isidro			5.41	99	5.41	99
Tagum City	1,236.65	355	1.81	33	1,238.46	388
Talaingod			10.70	126	10.70	126
District II						
BE Dujali			175.00	36	175.00	36
Carmen	109.50	51	174.85	198	284.35	249
IGaCoSamal	28.00	5	2.00	9	30.00	14
Panabo City	197.50	29	14.50	41	212.00	70
Sto. Tomas			32.33	327	32.33	327
<b>Totals</b>	<b>1,571.65</b>	<b>440</b>	<b>450.56</b>	<b>981</b>	<b>2,022.21</b>	<b>1,421</b>

Source: PAGRO- Fisheries Division, Davao del Norte

With regard to production, Table No.3-45 shows that fishery production in these areas had increased at an average rate of 14.45% annually in the last four years. BAS records

show that, fish production from municipal waters contributes an average growth rate of 9.88%, and production from aquaculture also increased at 20.86% annually. Noted increases were recorded in production from marine waters (21.26%) and brackish water (31.74%). An average of 5,438.77 metric tons of fishes are produced yearly from these sources, excluding those caught from open seas and landed in ports outside of the Province. With a limited volume of fish caught, fish requirement of the province is augmented by those coming from Davao City and General Santos City as well as Davao Oriental, Surigao del Norte and Zamboanga provinces.

*Table No. 3-45: Production Data for Fisheries,  
Province of Davao del Norte,  
CYs 2010-2013*

<b>Commodities</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>AAGR %</b>
A. Production, MT	7,041.44	5,600.14	5,083.11	10,557.54	14.45
1. Municipal Waters	3,075.50	2,527.70	1,972.82	5,478.29	9.88
Marine	3,070.83	2,525.10	1,970.16	5,475.04	21.26
Inland	4.67	2.60	2.66	3.25	(11.38)
2. Aquaculture	3,965.94	3,072.44	3,110.29	5,079.25	20.86
Freshwater	356.93	245.75	284.13	321.46	(3.43)
Brackish	1,269.79	1,170.39	1,119.71	2,903.29	31.74
Marine fish cages	2,339.22	1,656.30	1,706.45	1,854.50	(7.54)
B. Area Harvested,	2,771.49	2,749.11	2,269.11	1,888.95	(12.00)
Freshwater, has.	569	534.0	339.0	431.25	(8.83)
Brackish, has.	2,198.0	2,212.0	1,927.0	1453.5	(12.88)
Marine fish cages, no.	4.49	3.43	3.11	4.2	(2.20)

*Source : Bureau of Agricultural Statistics, Davao del Norte*

#### **4.1.4 Specific industry characteristics**

##### **a. Agriculture**

In terms of contributions to the income of the province from the agriculture sector, Cavendish banana contributed the most among the major crops produced at an estimated value of P14.177 Billion in 2013. This is followed by the estimated income from coconut production with P 4.486 Billion. Rice comes third at an estimated value of P 1.93 Billion. Coconut, like rice, is commonly grown in all municipalities and cities.

*Table No. 3-46 : Estimated Value of Production of Major Crops, by Municipality/City, Province of Davao del Norte, 2013*

Municipality/ City	Value, in Php Millions						Total
	Rice	Corn	Banana			Coconut	
			Cavendish	Local	Cardava		
District I:							
Tagum	49.74	2.75	1,031.76	4.11	11.89	673.40	1,773.65
New Corella	282.95	58.62	675.44	28.35	53.00	300.21	1,398.57
Asuncion	299.24	29.82	476.41	21.93	49.12	243.98	1,120.50
Kapalong	186.19	85.02	1,442.91	44.96	29.29	69.48	1,857.85
Talaingod	20.77	53.83	58.99	4.65	27.44	120.82	286.50
San Isidro	27.24	10.15		28.03	112.77	413.08	591.27
Sub totals	866.13	240.19	3,685.51	132.03	283.51	1820.97	7,028.34
District II:							
Panabo	14.28	6.56	3,947.2	18.00	46.97	522.16	4,555.17
Sto. Tomas	463.07	3.46	4,583.98	5.23	9.90	29.26	5,094.90
Carmen	324.3	1.32	956.42	6.75	5.41	393.55	1,687.75
BEDujali	245.22		1,004.15	0.78	2.50	12.26	1,264.91
IGCSamal	14.80	9.24		39.34	51.62	1,708.44	1,823.44
Sub totals	1,061.67	20.58	10,491.75	70.10	116.4	2,665.67	14,426.17
<b>TOTALS</b>	<b>1,927.80</b>	<b>260.77</b>	<b>14,177.26</b>	<b>202.13</b>	<b>399.91</b>	<b>4,486.64</b>	<b>21,454.51</b>

Source: Primary data as computed from PSA-BAS and AMAD -DA XI data

Notes :

A. The data presented in Table No. 3-34 are derived from the following computations:

1. For rice, corn, coconut and local banana:
  - a. Production data and farm gate price from BAS. For production data, use the provincial total.
  - b. Disaggregate by municipality and city using PAGRO data on production area or area planted.
  - c. This will generate the municipal/city breakdown for production by proportion
  - d. Multiply municipal/city production on 2013 by farm gate price in 2013 (PSA-BAS).
2. For Cavendish banana : data is derived approximation
  - a. Area by municipality/city derived from the CLUP (Agriculture Profile)
  - b. Production – average production from plantations (DA-AMAS)
    - o @ 40 tons average per year
    - o the municipal/city production (breakdown) is calculated
  - c. Value = production X \$ 0.1733/kg. X P 42.00/\$

B. Dash indicates that data is not available.

The major crops such as rice, corn, banana, and coconut have contributed the bulk of production and income for agriculture sector. However, the production of other crops also contributed to income in the sector. Individually, crops such as mango, durian, coffee, cacao, vegetables and spices, and root crops only have minimal production and income however, when pooled together they have significantly contributed to the overall output. These crops together with bangus production, livestock and poultry are the recommended priority industries by the LGU and the National Government Agencies



as outlined in the Davao Region Industry Cluster Plan 2014-2030. The contribution brought by these industries can be viewed in the succeeding tables.

**Table No. 3-47: Estimated Value of Production of Other Crops Identified in the Davao Region Industry Cluster Plan, by City and Municipality; Province of Davao del Norte: CY 2013**

Municipality/ City	Value, in Php Millions						Total
	Mango	Durian	Coffee	Cacao	Vegetables and Spices	Root crops	
District I:							
Tagum	0.58	83.12	2.05	2.05	4.70	2.60	93.20
New Corella	0.44	75.62	12.01	0.52	10.43	0.26	99.28
Asuncion	0.78	6.52	0.96	1.31	24.70	9.95	44.22
Kapalong	4.43	22.82	2.12	1.75	1.22	3.12	35.46
Talaingod	0.11	6.52	34.08	0.16	1.57	3.07	45.51
San Isidro	3.43	67.48	0.49	17.45	4.00	0.13	92.98
Sub totals	9.77	262.08	51.71	21.34	46.62	10.13	410.65
District II:							
Panabo	9.45	22.82	6.27	0.32	8.70	4.10	51.66
Sto. Tomas	3.89	2.93	3.85	0.09	12.70	34.00	57.46
Carmen	0.67	10.11	0.03	0.03	1.74	0.33	12.91
BE Dujali	0.32	5.22	-	0.01	-	-	5.55
IGCSamal	30.23	1.63	2.48	0.15	15.65	3.17	53.31
Sub totals	44.56	42.71	12.63	0.60	38.79	41.60	180.89
<b>TOTALS</b>	<b>54.33</b>	<b>304.79</b>	<b>64.34</b>	<b>21.94</b>	<b>85.41</b>	<b>60.73</b>	<b>591.54</b>

SA-BAS, PAGRO and PCIP

- The data presented in Table No. are derived from the following computations:
  - Production data and farm gate price from BAS. For production data, use the provincial total.
  - Disaggregate by municipality and city using PAGRO data on production area or area planted.
  - This will generate the municipal/city breakdown for production by proportion
  - Multiply municipal/city production on 2013 by farm gate price in 2013 (PSA-BAS).
- Dash indicates that data is not available.

For 2013, the combined income of minor crops reached P 591.54 Million. Among all minor crops, Durian was able to realize an income of P 304.79 Million. The municipalities of New Corella and San Isidro gained more income from durian production. Although all LGUs produce mangoes, the Island Garden City of Samal is its lead producer gaining P44.56 Million. Moreover, the Municipality of Talaingod stands out in the production of coffee owing to its topography. San Isidro also produces high grade cacao and is at present focusing on its mass production. Vegetables and spices are known to be produced in backyard scale but the Municipality of Asuncion and the Island Garden City of Samal are benefitting more from its production than the rest of the LGUs. The bulk of root crops come from the municipality of Sto. Tomas. On the other hand, Braulio E. Dujali has no data on income from vegetables and spices as well as root crops.

Meanwhile, fish production has realized a total income of P388.89 Million. The table below shows that fresh water fishponds have very negligible income in all LGUs except for BE Dujali. These fishponds thrive for family or community subsistence only. Coastal areas such as Tagum City, Panabo City, Carmen and the Island Garden City of Samal have

brackishwater fishponds that generated a combined income of P88.66 Million while marine fishing had an income of P147.81 Million for the whole province.

**Table No. 3-48: Estimated Value of Fisheries Production,  
by City and Municipality;  
Province of Davao del Norte: CY 2013**

Municipality/ City	Value, in Php Millions					
	Aquaculture			Total	Municipal Waters (Marine)	Total
	Brackishwater	Freshwater	Marine Cages			
District I:						
Tagum	63.46	0.001		63.461		63.461
New Corella		0.003		0.003		0.003
Asuncion		0.019		0.019		0.019
Kapalong		0.004		0.004		0.004
Talaingod		0.008		0.008		0.008
San Isidro		0.004		0.004		0.004
Sub totals	63.46	0.039		63.499		63.499
District II:						
Panabo City	10.14	0.001	177.78	187.931		187.931
Sto. Tomas		0.024		0.024		0.024
Carmen	5.62	0.130		5.75		5.75
BEDujali		130.24		130.24		130.24
IGCSamal	1.44	0.001		1.441		1.441
Sub totals	17.2	130.406	177.78	325.386		325.386
<b>TOTALS</b>	<b>80.66</b>	<b>130.445</b>	<b>177.78</b>	<b>388.885</b>	<b>147.81</b>	<b>388.885</b>

Source: PSA-BAS, PAGRO and PCIP

- 1.. The data presented in Table No. are derived from the following computations:
  - a. Production data and farm gate price from BAS. For production data, use the provincial total.
  - b. Disaggregate by municipality and city using PAGRO data on production area or area planted.
  - c. This will generate the municipal/city breakdown for production by proportion
  - d. Multiply municipal/city production on 2013 by farm gate price in 2013 (PSA-BAS).
2. Dash indicates that data is not available.

Livestock and poultry production in Davao del Norte is mostly backyard in scale. The availability of local materials for feeds made possible for all LGUs to raise livestock and poultry for household consumption or as a piggy bank, which can readily be disposed in times they need cash. The table below presents the 2013 livestock and poultry production of the province.

**Table No. 3-49. Estimated Value of Production of Livestock and Poultry,  
by City and Municipality, Province of Davao del Norte, CY 2013**

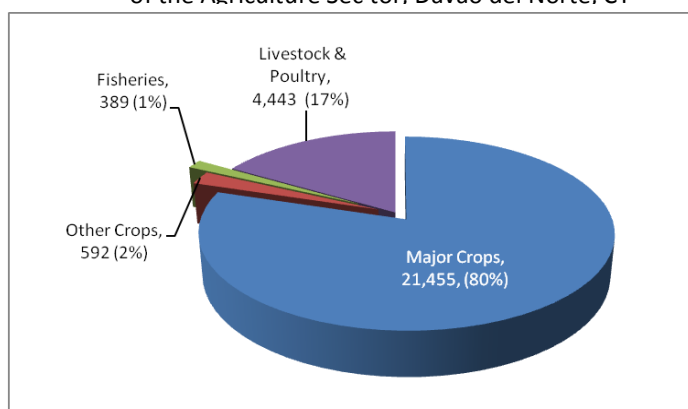
unicipality/ City	Value, in Php Millions					
	Carabao	Cattle	Hogs	Goat	Poultry	TOTAL
District I:						
Tagum City	6.29	12.29	107.48	10.79	18.11	<b>154.95</b>
New Corella	9.78	82.05	61.00	6.12	18.11	<b>177.06</b>
Asuncion	19.56	238.32	177.19	17.79	18.11	<b>470.97</b>
Kapalong	17.46	117.21	87.14	8.75	16.90	<b>247.46</b>
Talaingod	2.10	156.28	116.19	11.66	16.90	<b>303.13</b>
San Isidro	48.20	312.55	232.38	23.33	18.11	<b>634.58</b>
District II						
Panabo City	3.49	140.65	104.57	10.50	18.01	<b>277.22</b>

Sto. Tomas	15.37	183.63	136.52	13.70	18.01	<b>367.24</b>
Carmen	30.74	464.93	345.67	34.70	18.11	<b>894.14</b>
B.E Dujali	23.05	175.81	130.71	13.12	18.01	<b>360.71</b>
IGACOS	6.29	293.02	217.86	21.87	16.90	<b>555.93</b>
<b>TOTALS</b>	<b>182.33</b>	<b>2,176.73</b>	<b>1,716.72</b>	<b>172.32</b>	<b>195.32</b>	<b>4,443.41</b>

Source: PSA-BAS, PAGRO and PCIP

- 1.. The data presented in Table No. are derived from the following computations:
  - a. Production data and farm gate price from BAS. For production data, use the provincial total.
  - b. Disaggregate by municipality and city using PAGRO data on production area or area planted.
  - c. This will generate the municipal/city breakdown for production by proportion
  - d. Multiply municipal/city production on 2013 by farm gate price in 2013 (PSA-BAS).
2. Dash indicates that data is not available.

Figure 9. Distribution of the Total Production and Income of the Agriculture Sector, Davao del Norte, CY



The top income generator for carabao is San Isidro with P 48.20 Million, followed by Carmen and BE Dujali with P 30.74 Million and P 23.05 Million, respectively. For cattle, Carmen had generated a total estimated income of P 464.93 Million, followed by the Island Garden City of Samal (P 293.02 Million) and San Isidro (P312.55 Million). Meanwhile for hog production, Carmen ranked as

its top producer with income realized at P 345.67 Million. Although goat and poultry production is minimal however, they are present in all LGUS.

The distribution of the total production and income of the agriculture sector can best be viewed in the figure shown below:

**b. Industry**

The province of Davao del Norte is a major contributor of the Banana Industry in Region XI. The current production output of the province both in local and export banana provides gainful economic opportunities in the entire Banana Value Chain. About 90% (1,384,047 metric tons) of the total volume produced are sold out to the market, while the remaining 10% or 153,783 metric tons belong to the estimated annual rejects attributed to over-calibration, under-calibration, over-age, under-age and bruising which are unavoidable during harvest and processing stages. The volume of rejects undergoes alternative processing to produce various product lines and strongly support the banana value chain to include the following:

- Banana Chips Processing

Banana chips are made from unripe bananas preferably the Cardava variety. They are flavored sweet, salty or spicy, and have high nutritive value. In fact, they are a healthy

alternative to potato chips. Good quality and reasonable pricing enable the product to capture a considerable market share. Since they are a handy and filling snack, they are available in places that most people gather such as theaters, picnic spots, bus stands or railway stations, traffic junctions, etc. Retailing of banana chips is done through groceries, markets places and department stores.

- **Banana Fiber Production**

The production of banana fiber can possibly be adopted by local producers in Davao del Norte given the proper skills training. The banana plant has been extensively used as fibre for high quality textiles by other countries like Japan and Nepal dating back to the 13<sup>th</sup> century.

The Japanese uses leaves and shoots to derive the fibres to make the yarn, a material for making tablecloths, kimono and kamishimo. On the other hand, the Nepalese uses the trunk of the banana plant, of which fibres are used for making high end rugs.

- **Banana Paper**

Banana fibre is also used in the production of banana paper. The bark and stem of the banana plant as well as the non-utilizable fruits are used for artistic paper such as stationeries, greeting cards, gift wrappers and bags.

- **Banana Flour Processing (Food and Feed Grade)**

Banana flour is a by-product of Class "C" off-grade fresh bananas. Instead of dumping them they are utilized as banana flour, which is a good substitute for wheat flour. They also have high demand for catsup production. Aside from food grade flour, feed grade flour is prepared for livestock production.

Present production cannot cope with market demand due to inadequate drying facilities hence, this industry has a high potential for further development. Improvement of the production of banana flour will save the cost of importing wheat flour.

- **Farm Inputs Processing**

Diversification is essential in agriculture to be able to realize optimum output and income of agricultural products. Modernization of farm machineries and farm inputs improves yields and product pricing. The contributions of these agriculturally-linked sectors can motivate further value-adding processes in agriculture, which may create more economic impacts to the province.

- **Metal Working**

Metalworking is the craft and practice of working with metals to create individual parts, assemblies, or large scale structures. Metalworking is a very useful support industry to agricultural production. Various kinds of farm tools and equipment enable all farm work

faster and more efficient. Furthermore, production equipment gives precise processing of quality accepted products by both local and foreign markets.

- Plastic Twine Manufacturing

Plastic twine is the thin, stretchy, Saran wrap like stuff on the cardboard handle. It binds together loose items to be packed away or moved. This stuff simplifies product organization and packaging of banana and its by-products.

- Bamboo/Ipil-ipil Pole Production

Bamboo and ipil-ipil poles are used to prop up the banana trees. The expanding banana industry has also increased the demand for bamboo and ipil-ipil poles. Propping the banana plants enables growers to produce quality and unblemished fruits.

- Utilities- Water, Power and Telecommunication

Water, power and telecommunications utilities are very necessary in the production line. Their availability can help assure that products reach the clients in standard quality. Business is brisk when these utilities are efficient and cost effective.

- Animal Waste Processing

Sound livestock-raising is a challenge especially when dealing with its waste by-products such as manure, litter mortalities, hatchery, processing plant offal and wastewater. It will be worthwhile to invest on environmentally friendly, socially acceptable and economically feasible projects along this line.

- Recycling Plant

Recycling involves processing used materials into new products in order to prevent wasting potentially useful materials, reduce the consumption of fresh raw materials, reduce energy usage, reduce air pollution (from incineration) and water pollution (from land filling) by reducing the need for "conventional" waste disposal, and lower greenhouse gas emissions as compared to virgin production. Recycling is a key component of modern waste management and is the third component of the "Reduce, Reuse, Recycle" waste hierarchy.

Recyclable materials include many kinds of glass, paper, metal, plastics, textiles, and electronics (e.g., cell phones and computers). Materials to be recycled are either brought to a collection center or picked up from the curbside, then sorted, cleaned, and reprocessed into new materials bound for manufacturing.



- Pallet and Crate Production

Pallets and crates are vital items in handling, storage and distribution system particularly in the shipment of fresh bananas and other products. It is the most cost effective means of protecting and carrying a company's products to end customers or consumers. The wood industry of the province supports the banana industry in this manner.

- Warehouse and Cold Storage Facilities

The public refrigerated warehousing industry, in particular, offers a myriad of benefits to companies with storage and distribution needs for their low temperature products. Manufacturers, wholesalers, and retailers alike can cut down—or entirely cut out—a significant capital investment, directly freeing up capital for research and development, marketing, or other revenue opportunities.

- Banana-based gifts, toys and housewares

Banana-based gifts, toys and housewares processing supports the tourism industry in the province. Many products can be made from the by-product of banana production. While developing the technology to enhance available by-products, livelihood opportunities are being offered to the rural folks particularly the housewives.

### c. Trading and Services

The strategic location of Davao del Norte in the map has made the province a trading hub for its neighboring provinces of Agusan del Sur, Compostela Valley and Davao Oriental. It serves as a center that offers much-needed services not only for Davao del Norte itself but for the three provinces.

Commerce in Davao del Norte is either on trading and services, further categorized as wholesale or retail, manufacturing, production, processing or just plain services. Activities related to trading and services are grouped and presented as follows:

1. Food Trade
  - Eatery, refreshment parlor, restaurants, ihaw-ihaw/grills, fast foods, cafes
  - Lechon manok take out counters
  - Fruits, vegetables, spice
  - Beverages, soft drinks, energy drinks, fruit juices
  - Bakery, candies and pastries, pizza, cake house
  - Fish, meat, dressed and live chicken, salted and dried fish frozen meats, processed tuna, seafoods, poultry
  - Rice and corn (buy and sell/milling)
  - Livestock
2. Dry goods, general merchandise, sari-sari stores, groceries, convenience stores
3. Machine shop, scrap iron and metal, junk shop/bottles/plastics, welding, steel fabrication, vulcanizing shop, machining
4. Barber shop, beauty parlor, reflex and massage parlor

5. Lending, consumer financing, credit financing, pawnshop, money changer, money transfer, lessor
6. Carwash, motor parts, auto repair shop, motorcycle repair, surplus car and spare parts, brand new and recapped tires, engine change oil, hi-plast fiber glass repair, bicycle parts, second hand units repair and sale
7. Selling of cars, motorcycles, bicycles, trucks and multi-cabs
8. Cosmetics, medicines, perfumes, food supplements and herbal product lines, health care products, Chinese herbal products, pharmacy, soaps and toiletries
9. Manpower services and consultancy on :  
Planning and building design, well drilling, engineering, surveying, accounting and auditing, financing, management, computer, collection
10. Cellphones, cellphone accessories and load, calling station, communication supply, telecommunication services, computer units, parts, accessories and repair, computer games, internet cafes
11. Lodging houses, boarding houses, apartment, hotels, cottage rental, dormitory, bed spacer
12. Videoke, videoke machine rental, KTV bar, CD tapes rental, music lounge, restobar, sound system rental, video machine, VCD and DVD rental
13. Transportation services: trucking, cargo forwarding, van transport, hauling, car rental, motorcycles
14. Construction, construction supplies, lumber, concrete products, hardware, solar water heating system, solar heating, bamboo poles, paints, mini-sawmills
15. Driving school, institutions, schools, colleges
16. Furniture and fixtures, appliances, upholstery supplies, glass installation and repair, china porcelain jars and vases, guitar maker
17. Clothing: RTW, dress shop, tailoring, shoe repair, gowns and garments rental, laundry, boutiques, used clothing, footwear, bags, accessories, jewelries, underwear
18. Agricultural supplies : farm tools, veterinary supplies, chicken dung, feeds and antibiotics, agrichemicals and fertilizers rice hulls
19. Beach and inland resorts, beach shelters
20. Water refilling stations, water purifiers, processors, distributors
21. Digital photography, videography, photo studio
22. Printing press, art and sign, photo copier, publication, ads and promotion, printing, news publication and newspaper
23. Minerals, ores, gold, firewood and charcoal
24. ENT clinic, dental services and laboratory, maternity and lying-in clinics, medical clinics, health care centers, drug testing, therapy, pet clinic
25. Native products
26. Insurance
27. Flowers, balloons, table and chairs rental, plaques, trophies
28. Books, teaching/tutorial/school/office supplies and equipment, art materials
29. Passport and visa processing, ticketing office
30. Wedding coordinator/planner
31. Security agency
32. Gasoline station, petroleum products, emission testing centers
33. Gun store

34. Rubber products
35. Bio tech, pomology, crop protection and research
36. Radio station
37. Badminton courts, tennis supplies, billiard halls

In most LGUs, trading and services are simple, while the more complex type of services that are varied and advanced in terms of technology application are located in more urbanized areas such as Panabo City and most particularly Tagum City. People from other LGUs in the province, and even from other provinces flock to Tagum City for such services, making Tagum City the alternative service center to Davao City. Business in the cities of Tagum and Panabo is brisk and fast moving. Because of this, major commercial banks and financial institutions continue to open branches particularly in these cities to cater the financial needs and transactions of businesses. Franchises for major fast food industry and gasoline have also located in the province. Trading and services sector strongly supports the booming banana industry and other agricultural endeavors as well as the tourism development.

The table below shows the distribution of industries in the municipalities and cities of the province for CY 2013. It can be gleaned that trading and services is present in all the municipalities and cities and plays a big role with P 7,418.065 Billion in investments. This is followed by manufacturing and processing with P 1,391.019 Billion, then Banks and Financial Intermediaries with P 672.065 in investment.

*Table No. 3-50: Income Generated from Industries (in Million Pesos)  
Province of Davao del Norte, CY 2013*

LGU	Trading and Services	Manufacturing and Processing	Banks and Financial Intermediaries	Tourism	ICT	Fashion and Fashion Jewelry	Property Rental and Dev't.	Processed Banana	Total
Tagum	2,876	807.8	287.63	8.218	24.654	8.209	82.648	***13.841	4,109
New Corella	213.018	0.035	21.138	4.627	.200	1.600	0.00	0.00	240.618
Asuncion	955.729	0.150	1.569	0.00	0.881	0.00	0.079	0.020	958.428
Kapalong	433.906	0.560	86.045	0.590	1.938	2.446	8.724	10.615	544.824
**Talaingod	0.366	0.00	0.00	0.00	0.002	0.00	0.00	0.00	0.368
San Isidro	34.067	0.00	8.627	0.00	0.00	0.00	0.00	0.00	42.694
Panabo City	2,642	497.479	250.841	5.463	20.252	9.643	49.526	0.00	3,475.204
Sto. Tomas	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
*Carmen	137.649	83.570	10.953	0.00	0.585	2.553	2.457	0.00	237.767
BE Dujali	116.835	0.025	5.112	0.123	0.059	0.00	0.00	0.00	122.154
*IGCSamal	8.495	1.400	0.150	5.980	0.819	0.500	1.530	0.00	18.874
Davao del Norte	<b>7,418.065</b>	<b>1,391.019</b>	<b>672.065</b>	<b>25.001</b>	<b>49.39</b>	<b>24.951</b>	<b>144.964</b>	<b>24.476</b>	<b>9,749.931</b>

Source : Department of Trade and Industry

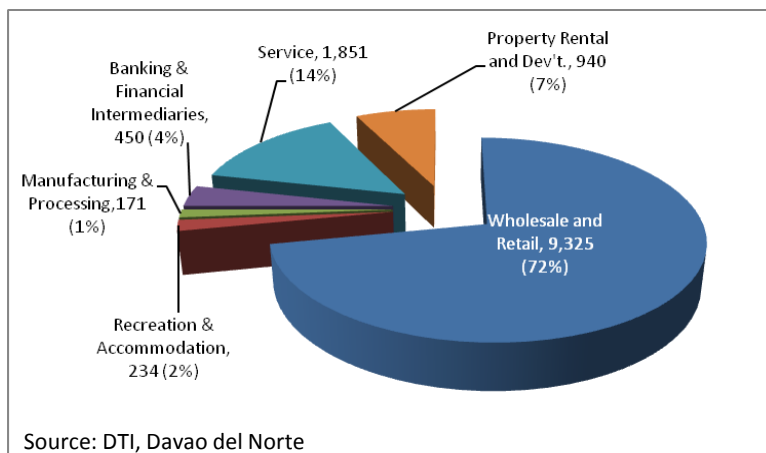
\*Declared capital of business based on the 2013 Business Permit Master List of respective LGUs;

\*\*Business Tax collected by the LGU in a given year;

\*\*\*Figure is exclusive of income generated through export, and is limited only to the monitored sales of Enterprises enrolled in the Export Pathways Program of DTI-DN.

As of 2013, a total of 12,971 business establishments were registered at the Business Permits and Licensing Offices of the ten Local Government Units of Davao del Norte, excluding the municipality of Sto. Tomas. Tagum City has the highest number of business establishment accumulating 41%. The flourishing city of Panabo and the municipality of Kapalong came next, as economic activities continue to

**Figure No. 10. Sectoral Disaggregation of 2013 Registered Business Establishments, Province of Davao del Norte**



grow in these areas due to the presence of large banana plantations and support industry (ie. packaging industry, transport services, etc).

**d. Wood**

The wood industry was once a major economic contributor in the Region. But when the moratorium on the cutting of natural grown trees in natural and residual forests was enforced, the wood industry’s performance suffered which resulted to scarcity in the supply of domestic raw materials. To supplement the needed requirement for raw materials, the industry resorted to the importation of wood products for local and domestic consumption.

To address this, the government devised a holistic approach towards reforestation efforts which encourages the participation of sectors in addressing the need for raw materials on wood in the domestic and commercial fronts. Community-based people’s organizations are given precedence in terms of developing, utilizing and getting access to forest resources through sustainable forest management. This thrust of the government has fueled the stakeholders to develop large agroforestry areas.

The wood industry is not making much headway in the export market, at least for the farmers engaged on the community-based reforestation activities. Production forest continued to be utilized as raw materials in the production of wood chips, particleboard and chopstick, furniture making, finished lumber, handicraft and pallet boards.

Areas planted by type of tenure starting CY 2011 up to CY 2014 totaled 15,323.08 hectares. The bulk of plantation development is accomplished through the National Greening Program (NGP).

*Table No. 3-51 : Areas Planted by Type of Tenure  
Province of Davao del Norte  
As of CY 2014*

CBFMA	FLMA	IFMA	CSC	Untenured	Others (Public Land, CADC)	Private	TOTAL
3,693.03	562.93	2,787.00	1,939.50	2,398.10	1,074.68	2,867.64	15,323.08

*Source : DENR, Davao del Norte*

The economic activity in the province had always been dominated by the banana industry in terms of area coverage, production and dollar receipts from export. Two distinct industry developments from banana can be discerned, namely: the production and export of Cavendish banana, which is the major player; and the banana chips industry with the use of local banana (cardava). It appears that the relationship between the wood industry and banana industry is seen in the support provided by the wood industry on the Cavendish banana export in the form of pallet board production.

Production forest continued to be utilized as raw materials in the production of wood chips, particleboard and chopstick, furniture making, finished lumber, handicraft and mostly on pallet boards.

*Production vs. utilization:*

In 2013, the province of Davao del Norte has an existing 120 wood processors and 3 (three) plywood/veneer plants. Wood processing plants operated to address the demand of wood by the banana industry. It was noted that the demand of the banana industry alone could not be supplied by the existing forest production in the province, hence nearby provinces also participated in the market.

*Table No. 3-52 : Wood Industries By Type of Permit  
Province of Davao del Norte, 2013*

<b>Type of Permits</b>	<b>Number</b>
<b>Regular Sawmill</b>	2
<b>Mini-Sawmill</b>	26
<b>Veneer</b>	3
<b>Mini Veneer</b>	2
<b>Resaw</b>	2
<b>Log Dealer</b>	1
<b>Lumber Dealer</b>	84
<b>Total</b>	<b>120</b>

*Source: DENR Davao del Norte*

There is also the strong domestic demand from the construction industry from both the private and government sectors. The government's demand for wood is particularly attributed to the boom in construction business especially in Tagum City, schools and other public buildings. Even with the presence of plywood processors in Tagum City, the province need to import wood products from sources outside the province just to augment the existing supply requirements.

If the supply and demand rule is applied, the condition should have made wood production very attractive to the farmers and existing farmers should have already benefited in terms of increase in income. On the contrary, the huge gap between supply and demand does not mean an advantage to the producers (farmers). Instead, at a price ranging from P1,800.00 – P 3,200.00 per cu.m. for falcata logs and P 1,700.00 to P 3,000.00 per cu.m. for Gmelina in the market only warrants a sustenance livelihood.



*Table No. 3-53: Price of Forest Products  
Province of Davao del Norte  
CY 2013*

Specie	Dia. Class (cm)	Log Bolt per cu.m. (php)	Lumber Size range per bd. ft.
Gmelina	60-up	P3,000.00	Green Lumber – PhP 16-18
	50-58	2,900.00	
	40-48	2,800.00	Kiln Dried – PhP 22 -24
	30-38	2,500.00	
	26-28	1,700.00	
Falcata	60-up	P3,200.00	Lumber By Class: Class A – PhP 11-13 Class B - PhP 9-10 Class C - PhP 6-8
	50-58	2,900.00	
	40-48	2,600.00	
	30-38	2,200.00	
	26-28	1,800.00	

*Source: DENR XI*

#### **e. Quarrying**

Davao del Norte is endowed with rich deposits of non-metallic minerals like guano, marble, limestone and others. As shown in the table below, the province has a total reserve of 35,000,000 metric tons of non-metallic minerals.

*Table No. 3-54 : Non-Metallic Mineral Reserves  
Province of Davao del Norte*

Non-Metallic Minerals	Location	Total Reserve (MT)
Guano Phospate	Samal & Talakud Is.	112,400
Rock Phospate	Samal & Talikud Is.	43,800
Sand & Gravel	Provincewide	1,800,000
Marble Deposit	Kapalong	35,000
Limestone/Lime Raw	Kapalong	7,854,083
Magnesite	Kapalong	35,000,000

*Source: DENR & PENRO*

The province has an abundant source of high quality grade of sand & gravel, a major component material construction. As of 2013 a total production of 1,967,235.50 cubic meters was realized and was valued at PhP 786,894,200 with taxes collected in the amount of PhP 236,068,260.00

For 2013 there were 82 permits issued for sand & gravel and earth fill extraction.

*Table No. 3-55 : Annual Production of Sand & Gravel  
Province of Davao del Norte  
CYs 2009-2013*

Location	Annual Production (Cu.M)					Total
	2009	2010	2011	2012	2013	
Carmen	45,594.5	27,145.0	51,265.0	62,180.0	56,612.5	242,797.0
Kapalong	53,523.0	31,192.0	21,435.0	46,085.0	61,475.0	213,710.0
Panabo City	84,549.5	44,348.5	34,072.5	20,366.5	13,057.5	196,394.5
Sto. Tomas	38,224.0	14,005.0	7,520.0	12,671.5	16,121.5	88,542
Tagum City	172,864.0	168,137.5	150,409.5	394,647.0	304,093.5	1,190,151.5
Talaingod	1,000.0			1,210.0	300.0	2,510
New Corella	-	-	222.5	330.0	323.0	875.5
Asuncion	-	-	3,900.0	22,690.0	1,105.0	27,695
IGaCoS	-	-		4,560.0	0.0	4,560
Total	395,755.0	284,828.0	268,824.5	564,740.0	453,088	1,967,235.50

Source: DENR & PENRO

The extraction of sand & gravel is one of the major income generating industries in the province where it was able to contribute a total of Php 236,068,268.00 to local revenues for the past 5 years, 2009 to 2013.

*Table No. 3-56: Revenues from Sand & Gravel Extraction  
Province of Davao del Norte  
CY 2009-2013*

Location	Total Production	Gross Income from Extraction (PhP)	Share on taxes		
			City/Mun	Province	Barangay
Carmen	242,797.00	97,118,800.00	29,135,640.00	29,135,640.00	38,847,520.00
Kapalong	213,710.00	85,484,000.00	25,645,200.00	25,645,200.00	34,193,600.00
Panabo City	196,394.50	78,557,800.00	23,567,340.00	23,567,340.00	31,423,120.00
Sto. Tomas	88,542.00	35,416,800.00	10,625,040.00	10,625,040.00	14,166,720.00
Tagum City	1,190,151.50	476,060,600	142,818,180.00	142,818,180.00	190,424,240.00
Talaingod	2,510.00	1,004,000.00	301,200.00	301,200.00	401,600.00
New Corella	875.50	350,200.00	105,060.00	105,060.00	140,080.00
Asuncion	27,695.00	11,078,000.00	3,323,400.00	3,323,400.00	4,431,200.00
IGaCoS	4,560.00	1,824,000.00	547,200.00	547,200.00	729,600.00
TOTAL	1,967,235.50	786,894,200.00	236,068,260	236,068,260	314,757,680.00

Source: PENRO-LGU

## f. Tourism

The tourism industry in the province is classified as sun and beach tourism, diving and marine sports tourism, education tourism, agri-tourism, sports tourism, MICE and events tourism, cultural tourism and eco-tourism. There are three identified major areas of destination in the province, namely: a) the Island Garden City of Samal with its white sand beaches, diving sites and water sports b) the vast banana plantations in the mainland, and c) a highland journey in nature and culture to include waterfalls, rivers, springs, lakes at the municipalities of Kapalong, New Corella, Asuncion, San Isidro, and the Ata-Manobo Cultural Village in the highland municipality of Talaingod. A table in the

Annexes of this plan provides a list of tourist attractions that can be found in the cities and municipalities of the province of Davao del Norte.

The following table shows the trend of tourist/visitor occupants in various hotels, inns and lodging houses for Davao Region from CYs 2008 to 2012. Davao City, being the regional center gets the biggest number of visitors who availed of hotel accommodations. Second on the list is Davao del Norte contributed by the Island Garden City of Samal.

*Table No. 3-57: Regional Occupancy Report  
Region XI: CYs 2008-2012*

Province/City	2008	2009	2010	2011	2012
Compostela Valley	44, 834	44, 939	43, 537	63, 543	50, 717
Davao City	655, 651	672, 863	682, 821	744, 275	1, 075, 000
Davao del Norte*	39, 982	42, 338	41, 614	30, 753	200, 400
Island Garden City of Samal	60, 954	65, 211	63, 000	77, 648	350, 262
Davao del Sur	37, 457	40, 347	40, 002	23, 565	34, 295
Davao Oriental	37, 338	37, 729	37, 584	17, 080	35, 034
Region XI	876, 216	903, 427	908, 558	956, 864	1, 745, 708

*Source : Department of Tourism, Region XI*

\*excluding Island Garden City of Samal

Most of the travelers in Region XI are Filipinos who live in some parts of the country other than Davao Region, balikbayans, and Filipinos residing outside the Philippines. In 2012, the domestic travelers in Davao Region comprised 92.9 percent of the region's total visitor arrivals. Foreign visitors on the other hand, represent 7.1 percent. Majority of these foreign visitors came from East Asia which includes the countries of China, Hongkong, Japan, Korea and Taiwan.

Of the 1,745,708 total visitor arrivals in Davao Region during 2012, 1,621,678 are domestic travelers while 124,030 are foreign visitors. Aside from East Asia, North America also comprised the huge bulk of foreign travelers in the region.

During the year 2011, out of 59,859 foreign travelers in Davao Region, 15,815 or 26.4 percent came from North America which comprises Canada and the United States of America.

*Table No. 3-58: Distribution of Visitor Arrivals in Region XI  
By Country of Residence: 2010 - 2012*

Country of Residence	2010	2011	2012
<b>Foreign Market</b>	<b>58,602</b>	<b>59,859</b>	<b>124,030</b>
ASEAN	2,802	2,549	
East Asia	22,777	21,863	
South Asia	553	725	
Middle Asia	353	829	
North America	15,765	15,815	
Oceania	2,793	2,814	
Europe	4,527	4,041	
Others &			

Unspecified Residences	9,032	11,223	
<b>Domestic Market</b>			
Filipino Residents	842,526	889,645	<b>1,621,678</b>
<b>Country of Residence</b>			
Balikbayans	7,430	7,360	<b>8,101</b>
TOTAL	908,558	956,864	<b>1,745,708</b>

Source: Department of Tourism XI

## 4.2 Potentials for contributing to local growth

### 4.2.1 Economic base industries

A location quotient (LQ) is a simple ratio used to determine the concentration or dominance of a particular industry in a Local Government area in comparison to a larger reference or benchmark region (i.e. province or Nation). It provides information about the capability and potentials of an industry using the following interpretation:

LQ = 1 - Perfect independence (no association between the industry and the LGU)

LQ > 1 - Positive association; over-representation of the industry in the LGU. This suggests that the industry is providing more than local requirements and is engaged in exports. The higher the value of the location quotient- the more it exceeds the value of 1- then the greater the likelihood that it is an export-oriented industry. Industries that have a likelihood of being economic base industries are those that have LQs substantially higher than 1.

LQ < 1 – Negative association; under-representation. This suggests that the industry is not engaged in export production.

LQ = 0 – Mutually exclusive; the industry does not exist in the province.

Davao del Norte has six major sectors that contribute to its economy namely, agriculture, industries, services, wood, quarrying and tourism. Among these sectors, agriculture contributes the biggest share by 63.41%, followed by industries with 22% and services with 5.86%. It can be understood that the economy of Davao del Norte is gradually veering from agriculture towards the advancing the manufacturing and further on to trading and services. The table below shows the location quotient of cities and municipalities by sector for 2013.

*Table 3-59: Location Quotient: Provincial Income from Major Sectors of Cities and Municipalities for CY 2013*  
Province of Davao del Norte

Municipality/City	Agriculture	Industries	Services	Wood	Quarrying	Tourism
Tagum	0.38	2.09	2.73	2.02	2.00	1.32
New Corella	1.24	0.49	0.05	0.24	0.01	1.71
Asuncion	0.99	1.60	0.02	0.15	0.02	0.01
Kapalong	1.02	0.70	2.85	0.47	1.05	0.19
Talaingod	1.28	0.00	0.01	2.04	21.57	0.08

San Isidro	1.52	0.14	0.01	0.35	-	0.00
Panabo City	0.90	1.70	0.16	1.63	0.08	0.11
Sto. Tomas	1.55	-	-	0.05	0.16	0.24
Carmen	1.25	0.31	1.70	1.25	0.97	0.21
BE Dujali	1.38	0.27	1.04	-	-	0.00
IGCSamal	1.01	0.02	0.08	0.45	-	6.22

*Source: Computed based on Table No. 3-18*

Table 3-42 suggests that agricultural products, which are dominated by Cavendish banana production, are inclined to be export oriented with most municipalities having location quotients greater than 1.0. This suggests that the sector is providing more of the LGU's requirements. The low location quotient in agriculture for Tagum City (0.38%), however, suggests under representation. This may indicate that the city is not largely dependent on the income from agriculture (or from Cavendish banana production). It may also suggest that other agricultural commodities produced by the city are not enough for local consumption, as it really is. The Island Garden City of Samal is having low location quotients in most sectors except in tourism. This suggests that these sectors are not providing enough of the requirements of the city and are generally non-export oriented.

In Tagum City the location quotients of industry, services, wood, quarrying and tourism sectors as the city's income generators are greater than 1. This suggests that these sectors propel the city's economic activity. On the other hand, Panabo City's industry and wood processing sectors have location quotients that are greater than 1.0. The agriculture sector of the city however, shows the potential for growth with the quotient of 0.90 and is expected to grow in the near future with the recent developments in mariculture industry particularly the bangus production.

Talaingod, which is dominantly forestland, showed a high location quotient not only in the wood sector but in quarrying as well. For the wood sector, Tagum and Panabo cities are making good in exporting wood products. Although these cities have limited forest production areas, wood processing provides more than their respective requirements. For the quarrying sector, the location quotients of Talaingod, Tagum City, Panabo City and Carmen show that these areas provided more than their respective sand and gravel requirements for construction purposes. Sand and gravel requirements of other LGUs are sourced from these quarrying areas.

All LGUs benefit from tourism in the province however, the Island Garden City of Samal enjoys a notable patronage from both local and international tourists. The city registers a very high location quotient of 6.22. Likewise the municipality of New Corella and Tagum City have gained increasing location quotients on tourism with 1.71 and 1.32, respectively. Talaingod boasts of a rich cultural heritage, being home to an indigenous people of the province. However, the absence or lack of facilities to accommodate tourists and visitors is a factor that deters the generation of desired income from tourism which explains the low location quotient of at present.

#### **4.2.2 Local employment growth**



**a. Agriculture**

It is seen that agriculture dominates the income source of the province, where the production and export of Cavendish banana is largely contributing. Cavendish banana is produced in plantation scale or commercial farms undertaking activities from land preparation, planting, plant care, harvesting, processing to marketing. Various ancillary services are likewise engaged at; to mention some are on research and development, trucking services, medical, and many more. Meaning, the industry is a job and employment generator. In production alone, an established Cavendish banana plantation requires around 1.5 to 1.75 employment in a hectare to do plant care and maintenance.

Knowledge and skills required for employment in Cavendish banana production and marketing is very varied and broad; from janitorial services to managerial in nature. This means that the demand for skills to be employed in the industry is simply “limitless.” Potential for local employment is simply available, hence to the benefit of the job-seeking local populace.

Aside from generating local employment, some communities surrounding Cavendish banana plantations make use of rejected fruits as a means of livelihood. Green bananas are peeled, dried and sold for the manufacture of paste extenders and animal feeds. Other uses of banana that could not pass the export qualities are sold for local consumption, fillers and additives in the manufacture of catsup; processed into food grade flour, chips and many other uses.

**b. Industry**

The banana chips processing industry is leading all other industries in the Banana Value Chain. It has in recent years become a very important player in our economy, not only in the processing aspect but also in the production of cardava banana, the raw material of banana chips.

Banana chips comes from fresh harvests of mature green fruit of saba variety which are deep fried in oil and comes in different processing stages and forms depending on buyer or consumer preferences.

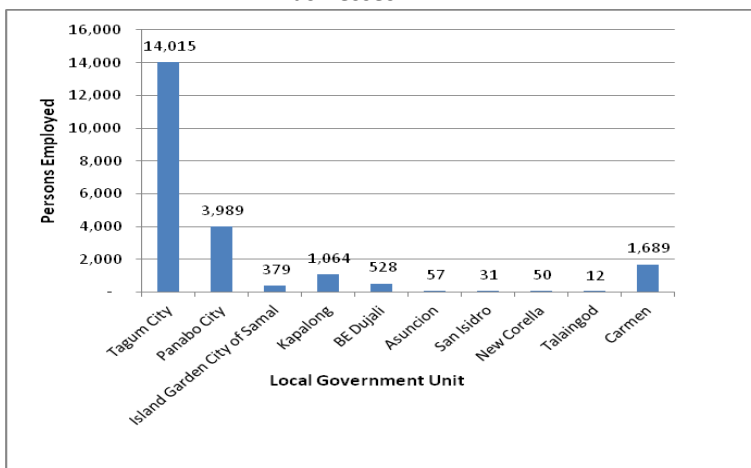
This industry is considered one of the major employment generators of Davao del Norte starting from the planting and production of Cardava to the processing and marketing of banana chips. Cardava production is backyard in scale, where most farmers devote 1-2 hectares average farmland for its production, but nevertheless it becomes a means of employment and a steady source of income for farm families. Although the technology applied is not as intensive compared to the production of Cavendish banana, but it still requires labor in its backward and forward linkages. A hectare devoted to Cardava production requires at least 1 man-day labor. Likewise the processing of banana chips employs an estimated 5,672 manpower every year.

Other industries are emerging and gaining importance due to the development of the banana industry. They either serve as backward and forward linkages that provide employment and means of livelihood to local communities in the province.

**c. Trading and Services**

Trading and services sector places third as income generator in the province since this sector is considered a supporting arm to the banana industry. Without the existence of this sector, the agriculture and industry sectors will also slacken.

*Figure No. 11: Employment of Newly Registered Businesses*



The establishment of new businesses engaged in trade and services provided an additional 21,823 jobs in the province in the year 2013. Tagum City, which is the center of trade of Davao del Norte contributed 64% in the total jobs generation. The table below shows the employment data generated from newly registered establishments.

**d. Wood**

As forest resources became depleted and harvesting of forest products became an issue, the supply of raw logs decreased to approximately 30% (2012-2013). However, the government exerted efforts to increase wood production as the local market badly demands wood products for the banana industry. The concerned agency, Department of Environment and Natural Resources in coordination with the Local Government Units (LGUs) have implemented programs and projects such as the Community-Based Forest Management (CBFM) and National Greening Program (NGP) to address the problem and to assure a more sustainable supply in the next five to ten years. Employment growth in the wood industry only involves the plantation establishment good for 14 man-days per hectare developed.

**e. Quarrying**

For CY 2013, a total annual production of 453,088 cu.m. or a 19.77% decrease from CY 2012 annual production were produced by the 82 permittees. The daily average volume of cubic meters produced per permittees is 279 cu.m., with an employment rate of 2 man-days. Under the Local Government Code of 1991, the host LGUs, namely: city/municipal and barangay are entitled to 30% and 40% share, respectively of gross collection from the utilization of mineral resources.

**f. Tourism**

The tourism industry contribution to the provincial economy is shown in Table No. 3-46 below. Visiting tourists spent a total of P 2,351.1 Billion in Davao del Norte for CY 2013, of which P 1,314.14 Billion or 55.9% was done in the Island Garden City of Samal.

Table 60. Tourism Income for the Year 2013 Based on Arrivals and Occupancy By City and Municipality, Davao del Norte

<b>LGU</b>	<b>No. of Arrivals</b>	<b>% Arrival</b>	<b>Total Tourist Spending (Php in Millions)</b>
City of Samal	375,468	55.9	1,314.14
Panabo City	15,664	2.3	54.82
Tagum City	178,840	26.6	625.94
Kapalong	9,805	1.46	34.32
New Corella	57,596	8.6	201.59
Asuncion	510	0.1	1.79
Sto. Tomas	21,702	3.2	75.96
BE Dujali	158	0.02	.55
San Isidro	42	0.006	.15
Carmen	10,950	1.63	38.33
Talaingod	1,024	0.15	3.58
<b>Total</b>	<b>671,759</b>	<b>100.00</b>	<b>2,351.16</b>

Source: Provincial Tourism Office

The business names registered for CY 2013 totalled 2,355 with total investments of P783.54 Billion and 3,801 employed. From these, there were 82 new beach and inland resorts, hotels and restaurants that were registered with capital investments totalling P24, 578, 608.06. Since tourists either foreign or local jump off from the mainland to the island, transportation to and from the island and even within the island itself is very essential hence, investments in this sector include a sea coastal transport liner (15 buses), four (4) fast craft – RORO, four (4) jeepneys, 638 tricycles and 46 passenger bancas. Aside from these, various industries most of which are related to trading and services are operating to cater the needs of the local residents and tourists alike. It is expected that tourism industry will continue to grow in the near future because of the on-going extensive tourism development and promotion not only for the island but also for the mainland. In addition, transportation services have become more accessible with the opening of more international and local flights to Davao City and lower fares rates offered by airline companies. The presence of tourists enlivens the business sector and creates a desired ripple effect in the entire economy.

#### **4.2.3 Competitiveness and market shares**

##### **a. Agriculture**

Among the major crops of Davao del Norte, Cavendish banana has the competitive edge in terms of production area and volume. It contributes 35.09% share to Davao Region and 56.55% to the national output. Likewise, Cardava banana production also contributes 1.87% to Davao Region and 19.06% share to the national total. Although the province’s contribution to Davao Region for coconut is very small, however, its contribution to the national level is bigger at 14.82%. The table below provides information on competitiveness and market shares of our major crops.

Table No. 61. **Production Performance of Major Crops in Davao**

**del Norte (DDN) and Their Comparison with  
Regional and National Totals: CY 2013.**

Major Crops	Parameters	Figures			% Share of DDN with	
		DDN	Reg. XI	Phils.	Reg. XI	Phils.
Rice	Area, hectares	32,781.00	103,294.00	4,746,091.00	0.69	2.18
	Production, MT	122,789.00	421,692.00	18,439,419.73	0.67	2.29
Corn	Area, hectares	15,172.00	159,378.00	2,563,718.32	0.59	6.22
	Production, MT	20,697.00	227,013.00	7,377,293.00	0.28	3.08
Coconut	Area, hectares	39,084.00	348,483.00	3,551,298.83	1.10	9.81
	Production, MT	228,096.23	2,275,979.56	15,354,334.19	1.49	14.82
Banana - Cavendish	Area, hectares	28,564.00	46,681.00	82,903.17	34.45	56.31
	Production, MT	1,484,529.39	2,392,320.18	4,230,088.74	35.09	56.55
Banana - Cardava	Area, hectares	4,356.00	20,136.00	183,483.00	2.37	10.97
	Production, MT	47,720.46	487,433.13	2,557,108.89	1.87	19.06
Banana - Table	Area, hectares	1,358.00	10,971.00	55,908.45	2.43	19.62
	Production, MT	12,212.52	203,899.44	930,031.68	1.31	21.92

Source: Bureau of Agricultural Statistics, Provincial Office

Banana is the leading fruit grown in the Philippines and a consistent top dollar earner of the country. At the global market, the Philippines is one of the world's largest banana producers having been ranked fourth next to India, Uganda and China.

The 2011 data provides information as to the Philippine position in banana export market. The Philippines was able to produce more than 9.2 million tons of bananas, accounting for 6 percent of the global production. As to export volume, the country also ranked fourth after Ecuador, Costa Rica, Colombia contributing about 9% of the total export. In the Asian Region, it contributes 93.6 percent of all banana exports. The table below presents the information on the global banana industry:

Table No. 62. Production and Export of Bananas and Plantains  
By country in 2011

Country	Millions of Tons	% of World Total
<b>I. Production</b>		
1. India	29.7	20.0
2. Uganda	11.1	8.0
3. China	10.7	7.0
4. Philippines	9.2	6.0
5. Ecuador	8.0	6.0
6. Brazil	7.3	5.0
7. Indonesia	6.1	4.0
8. Colombia	5.1	4.0
9. Cameroon	4.8	3.0
10. Tanzania	3.9	3.0
All other countries	49.6	34.0
Total World	145.4	100.0
<b>II. Exports</b>		
1. Ecuador	5.2	29.0
2. Costa Rica	1.8	10.0
3. Colombia	1.8	10.0
4. Philippines	1.6	9.0

5. Guatemala	1.5	8.0
All other countries	6.0	34.0
Total World	17.9	100.0

Source: *Banana Industry in the Philippines/www.slideshare.net*

Majority of the Philippine’s banana production comes from Mindanao. Davao Region has devoted a vast track of land for the production of banana and contributed 41% to the national output for banana. The table below shows the land are and volume of production of the regions in Mindanao:

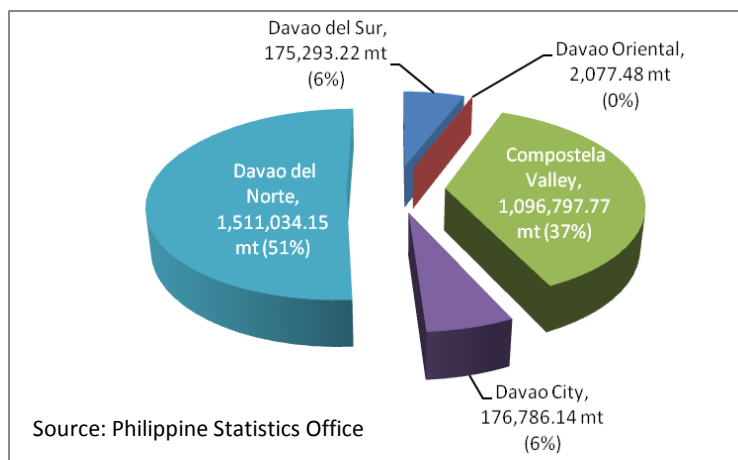
Table No. 63. Distribution of Banana Production from Mindanao by Region: CY 2011

Region	Land Area (Ha.)	Share of Production (%)
Region XI (Davao)	66,561	41.0
Region XII (SOCCKSARGEN)	24,200	11.2
Region X (Northern Mindanao)	36,294	10.1
ARMM	31,029	6.8
CARAGA	26,774	3.6
Region IX (Zamboanga Peninsula)	20,289	3.2

Source: *Banana Industry in the Philippines/www.slideshare.net*

The volume of banana production in Davao Region for that particular period was 2,961,988.76 metric tons. This is the total contribution of its province including Davao City. At the regional level, the province of Davao del Norte was able to realize the production volume of 1.5 million metric tons representing 51% of the regional output. Hence, the province is indeed an important player in the global banana industry. Breakdown of banana production in Davao Region is presented in the figure below.

Figure No 12. Breakdown of Banana Production in Davao Region in 2011.



In 2013, the Philippine banana production was severely affected by adverse weather conditions brought about by Typhoon Bopha in December 2012. About one quarter of the banana crop was destroyed. However, after the said typhoon, banana producers simultaneously exerted their effort to recover by projecting an increase of exports from 74.9 million boxes in 2012 to 180 to 200 million boxes in 2014.

**b. Industry**



In recent years, processed products of banana have entered both local and international markets and have proven to be a very lucrative business.

Presently, there are about 35 producers of banana chips in the Philippines of which 25 are located in Mindanao where Cardava banana is widely produced in bulk. From this number, 21 are in Davao Region out of which 7 are in Davao del Norte (See table below).

*Table No.3-64. Banana Chip Processors  
Province of Davao del Norte  
As of CY 2012*

<b>Business Name</b>	<b>Location</b>
1. Four Seasons Fruits Corporation	Purok Durian, Brgy. Apokon, Tagum City
2. Tagum Commodities Corporation/ El coco Manufacturing Trading Corporation	Tipaz, Magugpo East, Tagum City
3. Prime Fruits International	Brgy. Cuambogan, Tagum City
4. Royce Food Corporation	Brgy. Magdum, Tagum City
5. Lucille's Food Products	55 Sison Subd., Tagum City
6. Prime Xynergies Food Corporation	Pioneer Avenue, Mankilam, Tagum City
7. Philfruits Premium	Tipaz, Magugpo East, Tagum City

*Source : Department of Trade and Industry, Davao del Norte*

About 35% annual production of Cardava banana go into the processing of banana chips. It is considered a one big boost to the export potential of the Philippines, supplying 80% of its total production for export. Export earnings have reached approximately US\$42 million annually where export value continues to expand by 15% per year from 2009 to US\$50 Million in 2011. Major destinations of Philippine banana chips are Vietnam, USA, Germany, United Kingdom (Great Britain and New Ireland) and Singapore. The competitiveness of the Philippine banana chips is in its quality which is much more preferred compared to that of Thailand, which is the other major source of banana chips in Asia.

### **c. Trading and Services**

The comparative advantage of the province with its capital, Tagum City is its strategic location which positions itself as an alternative service center to Davao City. Tagum City lies at the crossroads of Davao City and the provinces of Davao Oriental, Compostela Valley and Agusan del Sur. The major consideration of consumers and businessmen alike in all the influence areas of Tagum City are the distance and travel time to get to Davao City, the Regional Center. If their needs are catered right in Tagum City, why travel the distance to Davao City. It is expected that by the time the Bukidnon-Tagum City route will be fully operational, it will also open up more opportunities for trading and services in the province.

### **d. Wood**

During the last four years, the capacity of the province to supply logs has exceeded. Due to the decrease in harvesting, the supply of finished wood products became scarce. The local market demand for wood pallet, furniture, plywood and lumber is addressed by importing from other areas while waiting for local tree farms to produce.

**e. Quarrying**

Due to the demand of quarry resources, the permittees have engaged in selling quarry materials to other buyers coming from other provinces. It is quite evident that the Municipality of Carmen has transported a bigger volume of sand and gravel to Davao City. As per record, only sand and gravel materials are transported outside the province, while filling materials like soil or mountain mix are consumed by local markets in the province. The volume transported outside the province is very minimal likewise it could not affect the local demand. Compostela Valley Province and Davao City have also existing permits in the same riverbeds that can be found along the rivers of Hijo and upper Lasang. The transported quarry materials to Davao City in 2005, 2006 and 2007 has reached to 17%, 8.4% and 12.96%, respectively. Also in 2007, quarry transported to Compostela Valley Province reached 0.12%. Please see table 3-65.

*Table No. 3-65. Volume of Sand and Gravel transported outside the Province*

Location	Volume Transported in Cu. M.					
	2011		2012		2013	
	Davao City	Comval	Davao City	Comval	Davao City	Comval
Tagum City	14,112	7,933	15,085	20,587.5	3,354.5	38,389.5
Panabo City	-	-	1,120	-	180	-
Carmen	9,330	-	15,440	-	21,167.5	-
Total	23,442	7,933	31,645	20,587.5	24,702	38,389.5
Annual Production	268,824.5	-	564,740	-	564,740	-
Percentage	8.72%	2.95%	5.60%	3.64%	4.37%	6.79%

*Source: PENRO-LGU, Davao del Norte*

**f. Tourism**

The Island Garden City of Samal had consistently been a favored tourist destination as shown in the table above, which suggests the number of tourist arrival based on hotel occupancy. Because of its proximity to and accessibility from Davao City, Samal Island enjoys a large share of tourists so that it plays second to Davao City in the recorded influx of tourists. The mainland, Davao del Norte also got a fair share of tourists who are seeking adventure particularly in nature and culture.

Davao del Norte took a share of tourist arrival in Davao Region by 31.54% while the Island Garden City of Samal had a share of this 31.54% tourist arrival at 11.48% in the whole region indicating the island as a favourite tourist destination because of its white

beaches, the world-class diving sites and rustic views. Table No. 3-66 below which shows the five-year data on traveler distribution in Region XI.

*Table No. 3-66. Yearly Distribution of Travelers in Region XI  
Per Province/City: CYs 2008 – 2012*

Province/City	2008	2009	2010	2011	2012
Compostela Valley	44,834	44,939	43,537	63,543	50,717
Davao City	655,651	672,863	682,821	744,275	1,075,000
Davao del Norte*	39,982	42,338	41,614	30,753	200,400
Island Garden City of Samal	60,954	65,211	63,000	77,648	350,262
Davao del Sur	37,457	40,347	40,002	23,565	34,295
Davao Oriental	37,338	37,729	37,584	17,080	35,034
Region XI	876,216	903,427	908,558	956,864	1,745,708

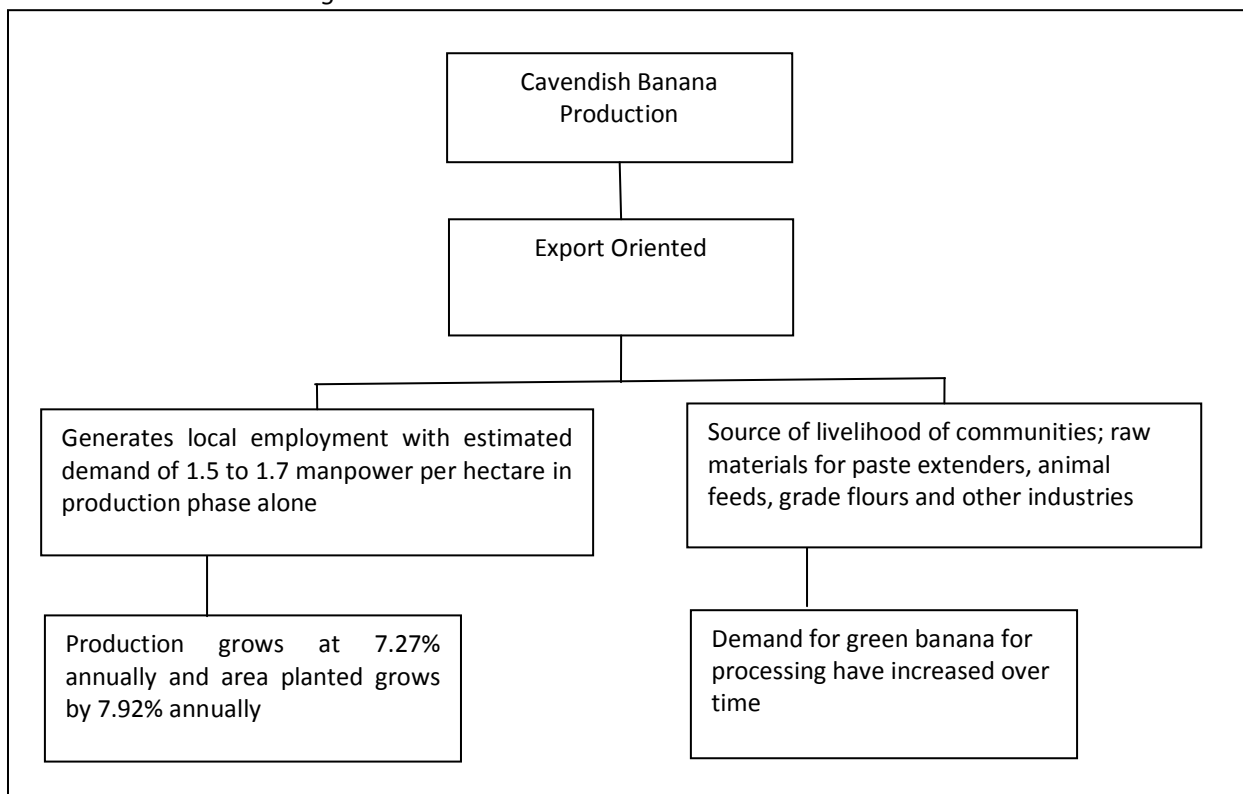
Source : Department of Tourism, Region XI

\*excluding Island Garden City of Samal

### 4.3 Potentials for local economic growth.

#### a. Agriculture

*Figure 13. Decision Tree on Cavendish Banana*



The growth of the banana industry is expected to continue in the near future as shown in the following projections:

- Cavendish banana export is expected to increase at 3-6 percent per year.
- Cardava banana chips export performance will have at least 10 percent growth rate per year.
- Domestic market of lakatan and latundan is expected to increase at around 3 percent per year with promising export potential.
- The bulk of banana supply will come from Mindanao.
- Local market demand for cardava in urban centers is increasing for snack foods such as banana cue, turon, etc. lakatan and latundan market demand is increasing particularly in the areas of Visayas and Luzon.

As to investment opportunities, the proposed expansion area for banana production in Davao Region is 18,389 hectares distributed in the provinces as follows:

*Table No.3-67: Expansion Area (Has.) for Banana Production  
Davao Region: 2007*

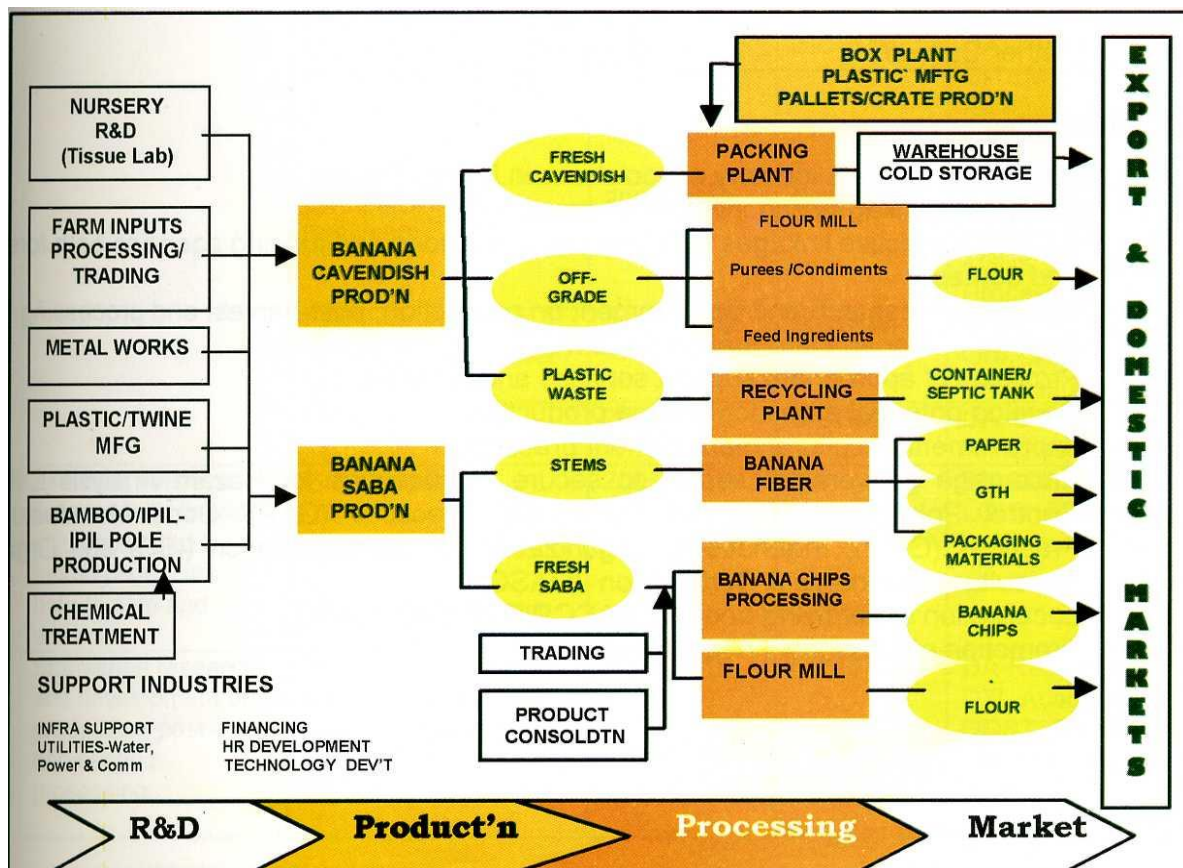
Cultivar	Expansion Area in Hectares					Total
	Davao del Norte	Davao Oriental	Compostela Valley	Davao del Sur	Davao City	
Cavendish	3,000	1,000	500	500		5,000
Cardava	2,500	2,000	3,540	100		8,140
Lakatan	1,500	500	200	100		2,300
Latundan	500	500	200	300		1,500
Unclassified					1,449	1,449
Total	7,500	4,000	4,440	1,000		18,389

*Source: Davao Region Industry Cluster Plan, 2005-2010*

Figure No. 14 shows the entire banana supply chain that illustrates the vast investment opportunities from the input stage up to the marketing stage. In the input stage, investment areas are in fertilizer, pesticides; tissue cultured planting materials, organic inputs such as organic fertilizers and bio pesticides, plastic bags, plastic mulch and packaging materials. In the production stage, investment opportunities are in credit and expansion. In the processing stage, banana chips and other products such as flour, animal feeds, food grade, among others are the prospective investment areas. In the marketing stage, banana has vast potentials in the logistics, post-harvest facilities, cold chain system and transport facilities for domestic and export markets.

*Figure No. 14 : Value Chain Analysis of the Banana Industry*

Province of Davao del Norte



Source : Davao Region Industry Cluster Plan, 2005-2010

The identified strengths of the banana industry are as follows:

- Large number of experienced and technically capacitated banana growers.
- Strong, dedicated and credible leadership in the industry
- Extensive membership
- Strong multi-sectoral linkages
- Presence of highly organized banana industry players in the province and in the region
- Large potential areas for expansion
- Existing R & D facilities with mature technologies
- Lesser vulnerability to calamities compared to other provinces in the region
- Presence of multi-national companies

Opportunities that can forge the growth of the banana industry in the province are identified as follows:

- Greater access to market
- Presence of ICT facilities
- Heightened global consciousness for health foods
- High employment and investment generation



Specific on the banana industry, the product and service providers comprise the nursery operators, banana growers/planters, banana consolidators and processors, and the micro enterprises.

The supporting industries consist of chemicals/fertilizer dealers or suppliers, manufacturers of farm implements/equipments, shipping and cargo forwarders; manufacturers of packaging materials and boxes to include wooden pallets and crates, producers/suppliers of sugar and oil for the processors' use.

The specialized infrastructure groups are institutions that provide utilities and services for the banana industry like water and power, public markets, packing houses, airport and seaports.

## **b. Industry**

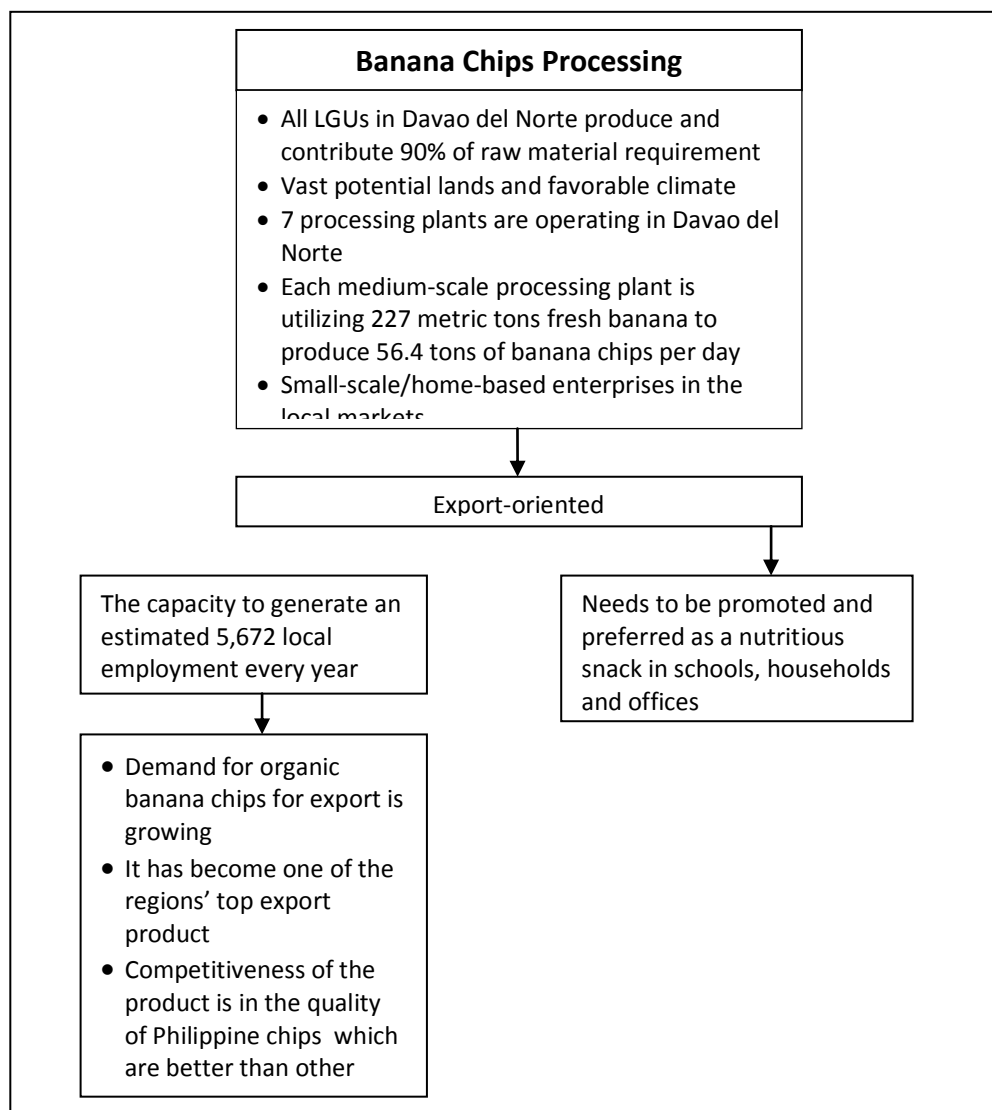
### **b.1 Banana Chips Processing Industry**

Hundreds of small Cardava farmers in Davao del Norte depend on banana chips processors and exporters as their main market. In Mindanao area, about 35% of fresh Cardava are processed into banana chips contributing for Mindanao to realize 80% share of the total production for export in the country.

The Philippines exports most of the banana chips to the United States contributing around 17% of the total world exports to that country. Some of the important markets of Philippine banana chips include Vietnam, UK (Great Britain and New Ireland) and Singapore. Vietnam was noted to be the leading buyer being a trans-shipment point to China.

A decision tree in Figure No. 15 below presents the dissection of the banana chips processing industry in the province of Davao del Norte.

Figure No. 15. **Decision Tree for Banana Chips Processing Industry**



**b.2 Other related industries**

Banana flour is a by-product from processing banana. It is a nutritious and easily digestible powder made from specially selected bananas that have been dried and ground. It is a main ingredient for making banana ketchup, as food additive, as food grade used in baking, past and high quality starch, for feed grade and an important adhesive component used in manufacturing plywood.

**c. Trading and Services**

The banana industry being the most important player of the economy of the province of Davao del Norte dictates the location and type of investments on services and support industries in the province as well as the strategic alliances and infrastructure facilities needed to sustain its growth. Aside from the data provided by the Department of Trade and Industry, participating cities and municipalities were

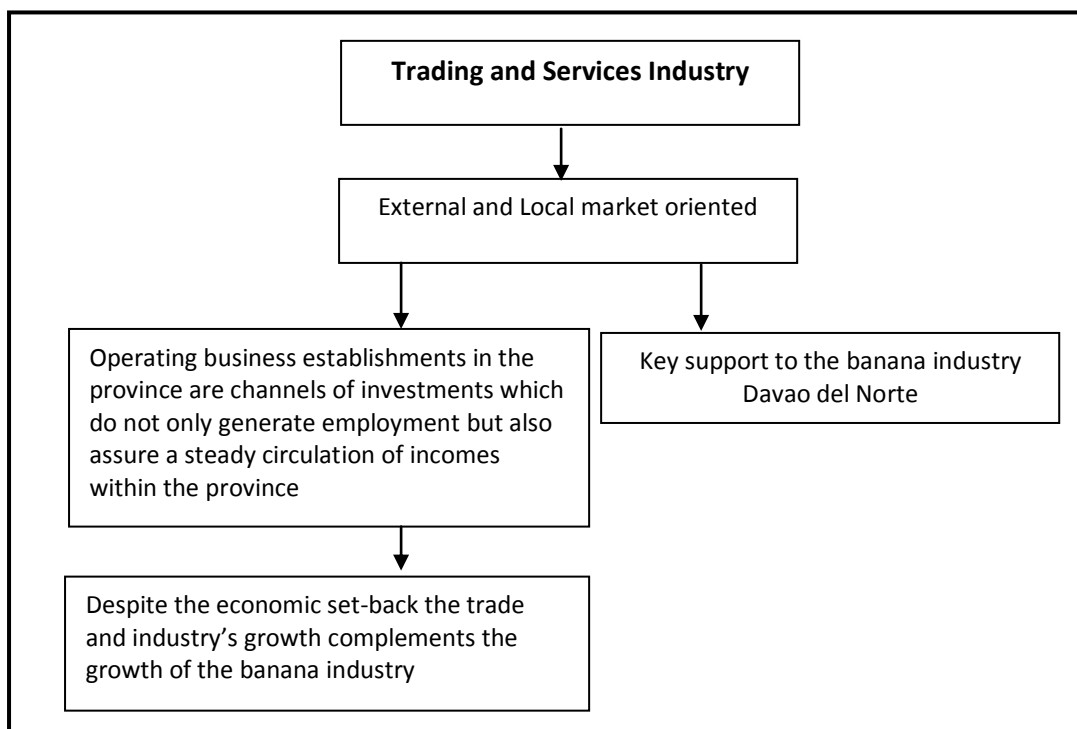
*Table No. 3-68: Total Trade and Services listed in SEPS Online Province of Davao del Norte: CY 2013*

<b>LGU</b>	<b>No. of Establishments</b>
Asuncion	259
Carmen	218
BE Dujali	2,867
Kapalong	1,164
New Corella	848
Panabo City	2,301
Sto. Tomas	1,273
Tagum City	5,827
Talaingod	17
San Isidro	204
Island Garden City of Samal	2,627
<b>Davao del Norte</b>	<b>17,605</b>

*Source : Socio-Economic Profiling System (SEPS) Online*

able to contribute to the Socio-Economic Profiling System (SEPS) Online the number of business establishments locating in their respective localities for CY 2013.

*Figure No 16: Decision Tree on Trade and Services*



Industries and services are very essential in the growth and development of the banana industry and the rest of the key players of our economy, namely: wood, tourism and mining industries.

**d. Wood**

In CY 2000, there was a drastic decline in the supply of wood due to stricter enforcement of selective logging policies imposed in 1987. As a consequence, importation of logs increased to augment the supply of many wood processors.

There was always a strong domestic market demand for wood. Its steady stream of revenues came from the construction industry, the government's requirement for desks, tables and chairs, pallets for the banana industry and wood products for export.

The construction industry needs lumber, woodworks, and other wood by-products for construction purposes. The Department of Education (DepEd) has yearly requirement for desks, tables and chairs and the banana industry's demand for pallets which is estimated at 60,000 pieces per month. These pallets while marketed domestically are also found in the export market as packaging materials for export banana and other goods.

Wood products like furniture and furniture parts, finger jointed lumber, builder wood works, door and window jambs, wood chips and knockdown pallets are also exported. The export of wood finished products had been increasing from 2002 to 2004 at an annual average of US \$ 2 million. The region's wood products found its way to the USA, Europe, Japan, Korea, Taiwan and other Asian countries.

Ironically, while the region's wood exports are on an uptrend, it remains to be a net importer of raw wood materials particularly logs for plywood and veneer. The sources of imported wood are New Zealand, Solomon Island and Papua New Guinea.

The total area planted to trees is estimated at 62,381.00 hectares. These include areas under the reforestation projects of DENR XI and plantations developed by private entities. Most of the planted areas are covered with CBFMA, the rest are covered under different plantation instruments such as Integrated Forestry Management Agreement (IFMA) and FLMA and Refo Loan 1&2.

*Table No. 3-69. Areas Planted, By Province, By Type, Davao Region, 2014 (In Hectares)*

Province	Private	CBFMA	IFMA	FLMA & Refo Loan 1&2	Total
Davao Oriental	9,335.00	8,211.00	5,167.00	4,310.00	27,023.00
Davao del Norte	1,813.00	5,097.00	2,053.00	2,571.00	11,534.00
Compostela Valley	1,804.00	7,819.00	60.00	2,736.00	12,419.00
Davao del Sur/ Davao City	512.00	6,828.00	258.00	3,807.00	11,405.00
Total	13,464.00	27,955.00	7,838.00	13,424.00	62,381.00

*Source: Davao Region Industry Cluster Roadmap*

The region's capacity to supply logs is estimated as 261,998.00 cubic meters. The region's industry requirement is 427,438.00 cubic meters. If the regions' capacity to

supply is compared with its requirements, a log deficit of 165,440.00 cubic meters may be noted.

The province industry requirement as shown in the table is 87,556.00 cu.m.. The figure unveiled a log deficit of 39,112.00. But it must be noted that aside from local sources. Some permittees are also contracting supply of logs from other provinces and foreign suppliers.

Moreover, in support to the wood industry's increasing demand for raw wood material supply in the province, reforestation efforts through the plantations have been carried out in full force. The inclusion of the component under the NGP program is adopted. Most of the trees planted are falcatta, fuel wood (ipil-ipil) kakawate and timber/indigenous species.

*Table No. 3-70: Raw Wood Industry Material Utilization, by Province, Davao Region, 2014*

Province	No. of Wood Processing Plants	Log Requirement (cu.m)	Log Supply (cu.m)	Surplus/ (Deficit) (cu.m)
Davao City/ Davao Sur	19	209,958.00	47,898.00	(-) 62,060.00
Davao del Norte	14	87,556.00	48,444.00	(-) 39,112.00
Davao Oriental	3	86,360.00	113,494.00	(+) 27,134.00
Compostela Valley	10	43,564.00	52,162.00	(+) 8,598.00
Total	46	427,438.00	261,998.00	(-) 65,440.00

*Source: Davao Region Industry Cluster Roadmap*

Davao Region has huge areas within production forest zone covering 349,941.00 hectares which are potential for development. These are located within the CBFM, Open Access, Industrial Forest Management Agreement (IFMA) and Certificate of Ancestral Domain Claims (CADC). Most of the areas for development are within the CADC representing 52% of the total area.

*Table No. 3-71: Areas Available for Development, By Province Davao Region, CY 2014 (In Hectares)*

	CBFM	IFMA	Open Access	CADT	Regional Total
Davao Oriental	9,929.00	19,132.00	31,393.00	9,829.00	70,283.00
Davao del Norte	4,294.00	6,220.00	12,613.00	42,419.00	65,546.00
Compostela Valley	10,988.00	66.00	7,861.00	43,819.00	62,734.00
Davao del Sur	18,433.00	1,783.00	45,290.00	85,872.00	151,378.00
Total	43,644.00	27,201.00	97,157.00	181,939.00	349,941.00

*Source: Davao Region Industry Cluster Roadmap*

The total area available for forestry development in Davao del Norte is 65,546.00 hectares or 18.73% of the total area in the region. With this, the province ranks third on the list for forestry development in Davao region.



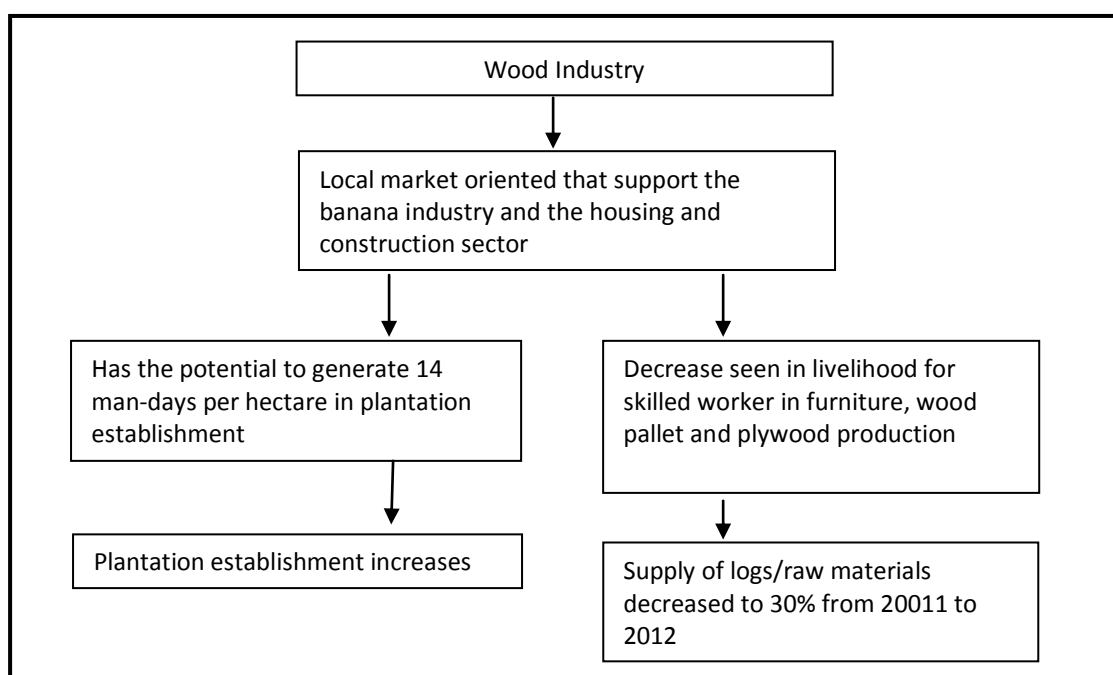
The following are the identified strengths of the wood industry in Davao del Norte:

- The establishment of plantations under the NGP which is strongly endorsed by the private sectors, CBFM Pos, the barangay LGUs and other NGAs.
- There is a high inventory of harvestable stocks of plantation species, which had been developed under the government's reforestation projects, private sector programs, special projects and foreign assisted projects.
- There is still a large area available for commercial tree plantation development to address the demand in later years.
- Strong government support to community based forestation projects. Under Executive Order No. 318-2004, the Community-based Forest Management shall be the primary strategy in all forest conservation and development. CBFMA is being issued to People's Organizations (POs) that comply with all the requirements that are designed for sustainable plantation development.
- Strong wood processing capacities and existing skilled manpower resources.
- Strong policy support. The development of the wood industry is given priority under the Davao Region Industry Cluster Roadmap
- The following are also the identified opportunities for the wood industry that our province can also take advantage:
  - Global strong advocacy for the use of renewable, biodegradable and organic products. This provides the opportunity to source out wood products from commercially grown species.
  - Shift to market acceptability of commercially-grown tree species.
  - Ever increasing world demand for wood products. Every year the world consumes approximately 1.6 billion cubic meters of industrial wood (timber and fiber). The demand for wood products worldwide is estimated to increase at 1 percent yearly.
  - Improved sea linkages. The strategic location of the Davao Region in the BIMP-EAGA Region and to the rest of the world makes it a good transshipment hub for regular international shipping lines. Tagum City, which is the center for wood processing industry in the province is only approximately 55 kilometers away from Davao City and thus, shares this competitive advantage.
  - Strong domestic market base. There is good demand for wood-based product within the region itself supportive of the existing banana and other important industries in the province.

To ensure the sustainability of the raw materials supply, primary focus must be on the establishment of clonal nurseries to support the development of tree plantations. The focus of the investment promotion initiatives should be on the following:

- Tree plantation development
- Research and development and other technical support to improve cultural practices
- Promotion of upstream industries which will create more value adding activities
- Maximum utilization of milling wastes and other wood by-products.

Figure No. 17: **Decision Tree on Wood Industry**

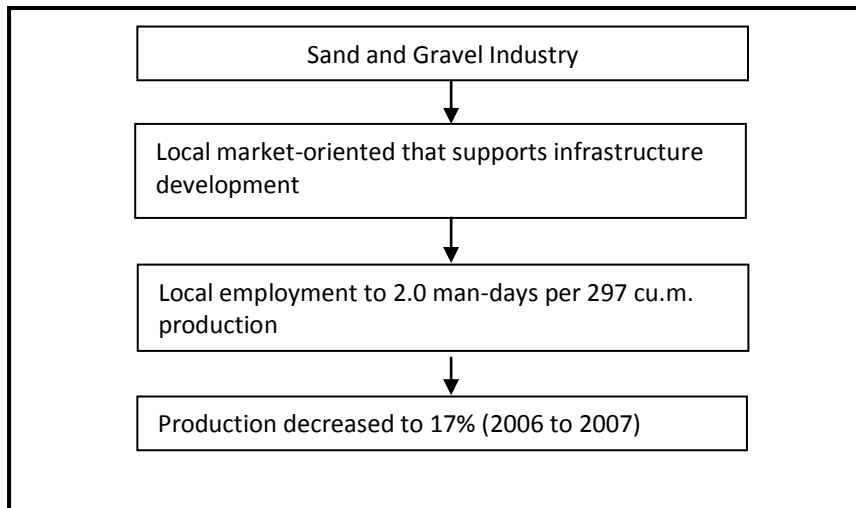


#### e. Quarrying

Mineral exploration and development has been considered by the national government as one of the top priority areas of development because of its potential to bring economy into a more robust state and alleviate poverty in the rural areas. The issuance of Executive Order (EO) 270 series of 2004 gives mandate to the promotion of responsible exploration, development and utilization of mineral resources.

The province only has an abundant supply of non-metallic resources. Non-metallic resources production chain starts from exploration to development to mining or quarrying. The raw materials such as rock aggregates and sand and gravel from the quarrying stage serve as input materials to the processing of cement which is a vital component to the construction industry. Much of the sand and gravel are important inputs to the expanding construction activities of the province.

Figure No. 18. **Decision Tree on Sand and Gravel Industry**



#### f. Tourism

The comparative advantage of the province of Davao del Norte can be attributed to the natural beauty that abounds such as beaches, dive sites, historical sites, cultural villages, forest ecosystems, mountains, caves, falls, rivers and springs, plantations and many others.

The province gets a fair share of tourist arrivals in the region so that it was also able to generate considerable income. It was estimated by the Department of Tourism Region XI that every tourist spends an average of P 3,500 per day during the 3 average days of stay anywhere in the province.

The known strengths for tourism industry in the province are the following:

- Natural attractions (islands to highlands) and unique collage of ethnic groups.
- Good climate all year round
- Institutional government policy on eco-tourism development is in place
- Established organizations from various sectors to assist the development of eco-tourism sites.
- Availability of infrastructure support facilities (airport, seaport, roads, etc.)
- Trainable manpower with high literacy rate.

Davao del Norte also shares in the tourism opportunities of the region, namely:

- Increasing awareness and appreciation for eco-tourism experience
- Accessibility to the BIMP-EAGA and ASEAN markets
- Increasing sea/air traffic brought about by demand of tourists
- Davao City being the primary gateway in Mindanao, and Davao del Norte is only 55 kilometers away from Davao City
- Mindanao as exotic wilderness destination
- Networking among South East Asian Countries on tourism destinations

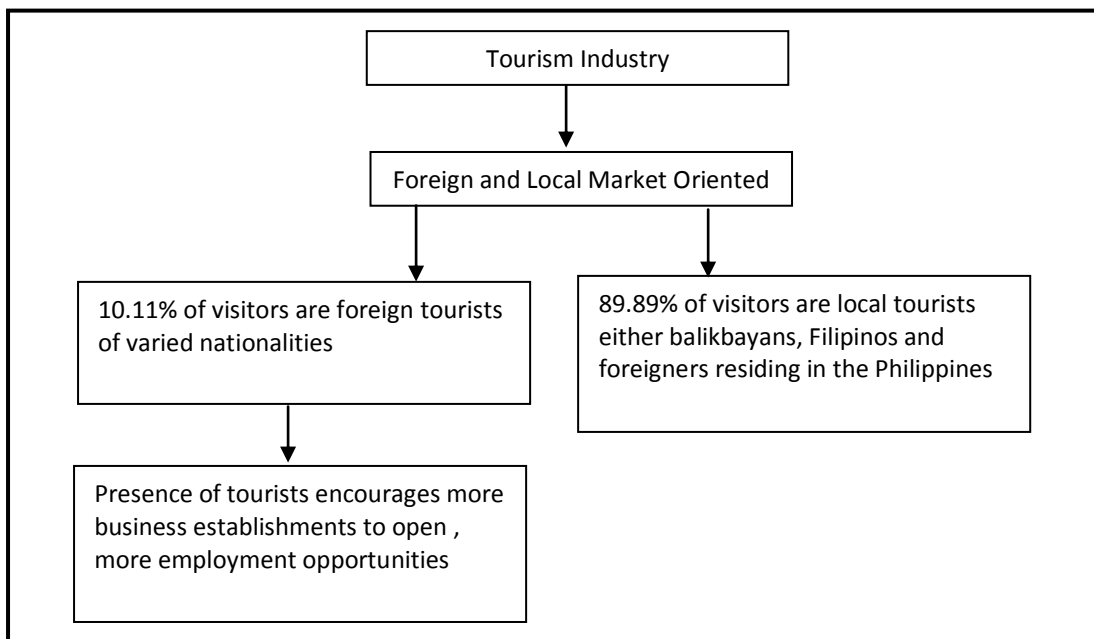
With nature-based tourism gaining wide recognition among tourists, special interests and opportunities can be offered for sites development, theme parks and even in-home/country experience packages. Events depicting the culture of local communities coupled with visits to cultural and natural destinations are great attractions to tourists/visitors seeking quality experiences.

The tourism supply chain includes tourism operators doing business to provide complementary services ranging from travel arrangements and bookings, transportation facilities, hotels/resorts accommodation, and food and entertainment, among others.

In recent developments on the tourism program of Davao del Norte the following undertakings conceived to increase our competitiveness in the industry, viz:

- The reopening of the Ekran Berhad Resort Hotel in Kaputian District of the Island Garden of Samal to boost the growing need for tourist accommodation in that part of the Island.
- The promotion of the Hijo Port Town which is expected to bring in more investments in port development and cargo shipment out and into the province.
- The promotion of the Island Garden City of Samal as an eco-adventure destination of the south, a retirement haven and a health and wellness capital in the south, aside from its flourishing sun and beach tourism.
- The marketing and promotion of the *"let's tour DavaoR"* brand that showcases the Island to Highland destinations that include:
  - a. Panas Inland Resort in New Corella
  - b. Madgao River in Asuncion
  - c. Carmen Veteran's Shrine (Ising Peace Monument)
  - d. Palayamanan in B.E. Dujali
  - e. MariculturePark, Cagangohan Biodiversity Conservation Park, Baywalk in Panabo City
  - f. Caving adventure in Kapitalong, New Corella and San Isidro
  - g. Sto. Tomas MEPEC
  - h. Banana plantation tours in Panabo and Sto. Tomas
  - i. MICE in Tagum City
  - j. Talaingod Tourism & Cultural Complex

Figure No. 19. Decision Tree on Tourism Industry



#### 4.4 Local Factors

##### 4.4.1 Physical Resources

The potentials of the province in agriculture and fisheries are vast since almost half or 46.82% (148,785 hectares) of the total land area of the province is devoted to various agricultural activities.

The geographic location of Davao del Norte with regards to agriculture is strategic. Being surrounded by mountain ranges with lush vegetation of neighboring provinces, the province is not frequently visited by typhoons. Climate is generally Type IV with rainfall more or less evenly distributed throughout the year. However, occasional flooding is experienced in some areas, caused by river overflows and run-off accumulations from higher elevations. Unlike before, flooding is no longer as intense and lasts a few days to recede. Dry spells, particularly El Niño, is also experienced and affects mostly the upland areas and elevated production areas where irrigation is intermittent. In terms of area elevation, most of the land areas of the province are potential for cultivation of various crops with 33% or 128,343 hectares that are very low lands, 21% or 84,651 hectares low lands, 7.66% or 29,501 hectares moderately low lands. Areas of higher elevation are classified as moderately high represent 34.50% or 132,802 hectares which are also potential for forestry development.

While the slope is characterized by level to nearly level (0-3%) with 118,871.60 hectares of 36.17%; gently to undulating slopes (3-8%) with 26,601.20 hectares or 8.09%; undulating to rolling slopes.



The soil characteristics of the province can support cultivation of most agricultural crops. Soil resources are dominantly clayey in texture that originates from alluvium washed from the uplands and from materials originating from igneous and sedimentary rocks. These soils exhibit medium to high fertility, except in some places where nutrient supplementation is required.

The province has abundant water supply both from surface and groundwater resources. 15 rivers and creeks traverse the province. The bigger rivers such as the Lasang, Tagum/Libuganon, Saug and Tuganay drain the broad west and north plains into Davao Gulf, and water the important agricultural lands along their course.

#### **4.4.2 Human Resources**

As of CY 2013, the population of 15 years old and above in the province totaled 624,410. From this 65% (404,991) are in the labor force while the population of the same age group who are not in the labor force comprise 35% (107,234). Those who are not participating in the labor force could be students, housekeepers, suffer from illnesses and disabilities or just choose not to seek any gainful employment. On the other hand, the population in the labor force is further categorized as employed and unemployed. Employed persons total 245,347 or 93.8% and the unemployed persons totaled 16,171 or 6.2%. The table below shows the information on labor force in Davao del Norte for CY 2013.

*Table No. 3-72. Labor Force, CY 2013*

<b>Province of Davao del Norte</b>				
	<b>MALE</b>	<b>FEMALE</b>	<b>TOTAL</b>	<b>%</b>
15 yrs.old & above	231,809	136,941	368,750	42.2
In the labor force	192,772	68,744	261,516	70.9
Employed	182,363	62,984	245,347	93.8
Unemployed	10,410	5,761	16,171	6.2
Not in the labor force	39,037	68,197	107,234	100.00

*Source: PPDO projected computation*

The October 2013 PSA report shows that the employment rate of Davao del Norte is more or less similar to that of Davao Region at 93 percent. However, it is slightly higher than the national figure of 92.7 percent.

*Table No.3-73. Employment Status, October 2013  
Provincial/Regional/National*

<b>Particular</b>	<b>Davao del Norte</b>	<b>Region XI</b>	<b>National</b>
Labor force participation rate	65	64	63.9
Employment rate	93	93	92.7
Unemployment rate	7	7	7.3

*Source: NSCB Report*

#### 4.4.3 Knowledge Resource

Various programs and projects of government carry the training component for capability building intended to enhance the knowledge and skills of end beneficiaries as well as the program and/or project implementers to assure that appropriate technologies are religiously followed and applied leading to the success of the program/project.

Aside from these, support assistance in the fields of technical, financial, organizational and marketing management. The following are the support assistance of various agencies both in the national and local that promote productivity and economic growth:

*Table No. 3-74 : Programs and Projects of Government Agencies  
as Knowledge Resource, Province of Davao del Norte*

<b>Support Assistance by Office</b>
<p>1. Department of Trade and Industry</p> <ul style="list-style-type: none"> <li>• Industry Congress</li> <li>• Industry Benchmarking</li> <li>• Processor-Supplier Match-ups</li> <li>• Product research and development</li> <li>• Industry Information System development</li> <li>• Technology Upgrading</li> <li>• Marketing Assistance</li> <li>• Institutional organization and strengthening</li> <li>• Product consolidation</li> <li>• SME financing support program</li> <li>• SME information support (provision of consultancy services and advisory, SME database and SME center)</li> <li>➤ Facilitation to partnership linkages for competitive support such as market matching, selling and trade missions</li> <li>• SME counseling and advisory (graduate studies practicum program, business counseling, coaching on bookkeeping, counseling on operational planning, financial management consultancy, technical advisory and community extension)</li> <li>• Industry productivity and quality <ul style="list-style-type: none"> <li>○ Productivity trainings (occupational health and safety &amp; 5S)</li> <li>○ Good agricultural practices</li> <li>○ Good manufacturing practices</li> <li>○ Center for Excellence-Research (UM Tagum College)</li> <li>○ Center for Excellence-Technology (DNSC)</li> </ul> </li> <li>• Entrepreneurship trainings</li> </ul> <p>2. Provincial Agriculturist's Office</p> <ul style="list-style-type: none"> <li>• Food Cereals Production Program</li> <li>• Diversified Farming Systems Development</li> <li>• Commercial and Industrial Crops Production Program</li> <li>• Research Development and Extension Program</li> <li>• Institutional Development Programs</li> <li>• Agri-Infrastructure Programs</li> <li>• MBN Approach Programs</li> <li>• Fishery and Livestock Production Program</li> </ul> <p>3. Provincial Governor's Office</p>

- Eco-Tourism Development
4. PENRO-LGU
- Community-based Tourism Development Program
  - Institutional capability-building program
  - Tourism promotion program
  - Community-based Forest Management Program
  - Communal Tree Plantation Development/Contract Reforestation and Agro-forestry Program
  - Sustainable Upland Development Livelihood Program
  - Coastal Resource Management Program

Other components such as monitoring and evaluation are important factors that ensure the sustainability of programs and projects implementation. Said components also provide essential information that will enhance knowledge on the program

#### **4.4.4 Capital Resource**

The annual income realized by the Provincial Government of Davao del Norte had a fluctuating trend since CY 2009. From 2009 to 2010, the provincial government was able to achieve an increase of 5.41%, and 8.06% in 2011. By 2012, income plunged to 0.59% due the early effects of typhoon Pablo’s devastation. However, the province was able to recover by realizing an income growth of 11.86% in 2013. The total receipts of the province are shown in the following table:

*Table No 3-75. Statement of Income  
Province of Davao del Norte  
CYs 2009-2013*

<b>Year</b>	<b>Income (Php)</b>	<b>% Increase/ Decrease</b>
2009	761,915,196.00	
2010	805,454,386.00	5.41
2011	876,038,961.00	8.06
2012	881,216,036.23	0.59
2013	999,761,697.12	11.86

*Source: Annual Report 2013*

The rise and fall in incomes from CY 2009 to CY 2013 did not deter the Provincial Government of Davao del Norte to implement priority programs and projects that are supportive to development while promoting economic growth in the area. Its untiring effort extends the needed services through the assistance of external sources.

*Table No. 3-76: LGU Appropriation and Expenditure for Economic Services  
Province of Davao del Norte, CY 2013*

Items	Appropriation (Php)	% Distribution	Expenditure (Php)	% Distribution	% Expended
<b>Grand Total</b>	<b>1,008,958,991.57</b>	<b>100.00</b>	<b>939,294,154.87</b>	<b>100.00</b>	<b>93.10</b>
<b>Total Economic Services</b>	<b>203,887,253.00</b>	<b>20.21</b>	<b>178,518,073.28</b>	<b>19.01</b>	<b>87.56</b>
Agriculture Services	32,256,685.00	15.82	29,839,704.08	16.72	92.51
Veterinary Services	7,828,548.00	3.84	7,230,529.84	4.05	92.36
Environment/Natural Resources Services	15,821,510.00	7.76	14,405,121.49	8.07	91.05
Engineering Services	147,980,510.00	72.58	127,042,717.87	71.17	85.85

*Source: Provincial Budget Office, Davao del Norte*

The total LGU appropriation for 2013 was Php 1,009 Billion of which 20.21% (Php 203.89 Million) of the amount was allotted for economic services. Economic services cover the areas of agriculture, veterinary environment and natural resources and engineering. Having an agriculture-based economy, agriculture had an allocation of Php 32,256,685.00 or 15.82%, which is bigger than veterinary and environment and natural resources services. And since the agriculture in our province is still developing, it needs infrastructure support hence, engineering services had the biggest share of the budget with Php 147,980,510.00 or 72.58%. On the other hand, total expenditure of the province for economic services totaled Php 178,518,073.28, which represents 87.56% of the amount appropriated for 2013. This suggests a total savings of Php 25,369,170.72.

#### **4.4.5 Infrastructure Resource**

##### **a. Irrigation Services**

There are four major categories of irrigation systems presently in operation in the Province. These are the River Irrigation Systems (RIS) or the run-of-the-river- type, the Communal Irrigation Systems (CIS), the Communal/Pump Irrigation Projects (CIPs/PIPs) and the small scale irrigation projects (SSIPs). All systems are estimated to serve around 14,000 farmers. Table No. 3-58 shows the distribution of these systems in the Province. The River Irrigation Systems are the largest systems with the widest coverage or service areas. These are the Libuganon Left RIS, Saug RIS, Libuganon RIS, Kipaliku RIS and the Lasang RIS. These systems are managed by the National Irrigation Administration (NIA) with potential area of 24,637.92 hectares. However, only 75% or 18,439.60 hectares are effective areas devoted to Cavendish banana and rice production of 11,893.49 hectares and 6,546.11 hectares, respectively.

The smaller version of this, the Communal Irrigation Systems (CIS) is being managed by the Provincial Irrigation Office. It is similar to RIS, but each system serves less than 1,000 hectares. Around 1,255 hectares are served by eight (8) CIS, both grown to rice and Cavendish banana.

Smaller systems like the Communal and/or Pump Irrigation Projects (CIPs/PIPs) and small scale irrigation projects (SSIPs) are put up by the Department of Agriculture and the local government units. These are the small water impounding projects and diversion dams (SWIPs/DDs), shallow tube wells (STWs), open surface pumps, and other water harvesting units. These are managed by farmer's associations (FA) or the Irrigators' Service Associations (ISA). These systems primarily serve the rice areas, but it may not limit its utilization to serve Cavendish banana production areas if needed.

*Table No. 3-77: Irrigation Systems Facilities, Davao del Norte, 2013*

Name of Systems	Municipalities Covered	Service Areas, Hectares			Farmers Served
		Potential	Effective		
			Rice	Banana	
1. Libuganon Left RIS	Asuncion Kapalong	1,015.00 372.90 642.10	228.04	199.16	2,500
2. Saug RIS	Asuncion Kapalong New Corella Tagum City	5,294.00 3,016.00 468.00 1,604.00 206.00	3,152.88	623.27	2,436
3. Libuganon RIS	B.E. Dujali Carmen Sto. Tomas	10,800.00 3,553.10 3,169.12 4,077.78	6,209.00	1,252.17	5,289
4. Kipaliku RIS	Sto. Tomas	2,600.00	588.20	1,560.45	735.00
5. Lasang RIS	Carmen Panabo	4,928.92 3,263.09 1,665.83	1,715.37	2,911.06	1,931
6. Communal Irrigation Systems (8 CIS)	Kapalong New Corella Sto. Tomas Panabo City	1,255.00	854.00	281.00	970
7. Communal Irrigation Projects (3 CIPs)	Carmen New Corella Asuncion	230.00	197.00	15.00	137
<b>TOTALS</b>		<b>26,122.92</b>	<b>12,944.90</b>	<b>6,842.11</b>	<b>13,998</b>

Source: National Irrigation Administration and MAO/ CAO of Local Government Units

### **b. Pre and Post Harvest Facilities**

It is observed that commonly used production facilities in rice and corn are powered by lower rated engines ranging from 7 to 11 horsepower prime movers, which are usually attached to hand tractors and mechanical dryers. Bigger machines like self-propelled tractors and combines, are seldom seen for land preparation in cereals production. This is because their use in small farms and land holdings is not economical. Operating self-propelled tractors, however, can be found in corporate farms and farms managed by



cooperatives, where large contiguous areas can be worked on. Typical example is in the production and processing/marketing of Cavendish bananas.

In the study conducted by the Bureau of Post Harvest Research and Extension (BPRE), there is a sufficient number of rice threshers operating in the province, with all municipalities and cities exceeding the required number of units if we based it on the total volume of rice being produced in a cropping season. However, drying facilities are deficient by an estimated total of 96 units, equivalent to 34,605 metric tons of paddy rice to dry. Only Kapalong and Talaingod have surpluses in drying facilities.

There was also a shortage of storage facilities in all municipalities and cities. Around 150 units of additional storage facilities are required to store around 110,000 metric tons of dry palay. In terms of milling facilities, around 37,300 metric tons of dried palay could not be milled on schedule (except in New Corella, Asuncion and Sto. Tomas where sufficient milling facilities are available). This volume requires around 50 units. Table below provides the figures of the recent inventory conducted.

*Table No. 3-78 : Inventory of Post Harvest Facilities  
by Cities and Municipalities  
Province of Davao del Norte, 2013*

Cities / Municipalities	Drying Facilities				Threshing/Shelling			Milling		Storage
	C/RD	FBD	MFD	MPDP	RT	MPST	CS	CM	RM	
District I:										
Tagum City		1			15	1	1	1	4	1
New Corella		3	6	59	178	16	1		49	5
Asuncion	2	8	4	54	207				22	8
Kapalong		1	6	62	83	12	4	1	1	13
Talaingod		1		22	11		4	7		1
San Isidro		33		76	7			8	1	
District II:										
Panabo City	4	2	5	29	27	1		1	11	2
Sto. Tomas	2	7	2	50	67				26	7
Carmen		7		54	109	1			2	4
BEDujali	1	6	4	16	47				16	13
IGCSamal	1			28	2		1	7	3	1
<b>TOTALS</b>	<b>10</b>	<b>69</b>	<b>27</b>	<b>450</b>	<b>753</b>	<b>31</b>	<b>11</b>	<b>25</b>	<b>135</b>	<b>55</b>

*Source: Bureau of Postharvest Research & Extension, Davao del Norte Postharvest  
Provincial Agriculturist's Office, Davao del Norte*

C/RD- columnar/recirculating dryer; FBD- flat bed dryer; MFD – mobile flash dryer;  
MPDP- multipurpose drying pavement; RT- rice thresher; MPST- multipurpose sheller/thresher; CS- corn  
sheller; CM- corn mill; RM- rice mill

### **c. Farm to Market Roads**

Another support infrastructure which is very much of importance to the development of the agriculture sector is the improvement of accessibility through well defined road sections, the farm to market roads. Well established road networks facilitate transport of goods and services into and out of the farms; increases production efficiency and

reduces losses, among others. A comprehensive discussion of road network will be taken up in the transport section of this plan document.

#### **4.4.6 Legal/Regulatory Resource**

##### **1. Republic Act 8289 or the Magna Carta for Small Enterprises (enacted 1991, amended 1997)**

This act created the SMED Council which is primarily responsible for the promotion, growth and development of the Philippine SME sector. The function of SMED Council is to formulate a comprehensive strategy to promote SMEs and integrate it into other Philippine development plans.

Launched in July 2004, the SMED Plan 2004-2010 is meant to help in the graduation of MSMEs to higher levels of business undertakings and upgrading their productivity and value-added capabilities.

It is expected that by 2010 SME gross value added will improve from 32% to 40% and create 3.4 jobs all over the country through the following schemes:

- Reforming business and investment environment by streamlining business regulatory requirements, advocacy to SME related laws and restructuring of SME institutions
- Providing access to finance through SME financing support programs
- Expanding market access through information support, partnership and linkaging for competitive support, support to trade fairs and market services, product development and design services and information technology appreciation.
- Enhancing productivity and efficiency through SME counseling and advisory, industry productivity and quality and entrepreneurship training.

##### **2. Republic Act 3883 – Business Name Registration**

Every establishment, individually-owned, regardless of size and nature of business, must have its business name registered.

Any person, eighteen (18) years old or above may apply as the registered owner of the business name. Person of questionable character or those who have been convicted of any crime are disqualified from applying a business name.

Exempted from registering their business name are firms, whether partnership or corporation which are duly registered with the Security and Exchange Commission (SEC). However, if they wish to, they may still apply for a Business Name.

### **3. Local Business Licensing Ordinances**

#### **4. Republic Act 7160**

Chapter II, Section 17. - (3) For a Province: (iii) Pursuant to national policies and subject to supervision, control and review of the DENR, enforcement of forestry laws limited to community-based forestry projects, pollution control law, small-scale mining law, and other laws on the protection of the environment; and Mini-hydro electric projects for local purposes;

Article III, Section 468 (1) - Approve ordinances and pass resolution necessary for an efficient and effective provincial government and, in this connection, shall:

(vi) Protect the environment and impose appropriate penalties for acts which endanger the environment, such as dynamite fishing and other forms of destructive fishing, illegal logging and smuggling of logs, smuggling of natural resources products and of endangered species of flora and fauna, slash-and-burn farming, and such other activities which result in pollution, acceleration of eutrophication of rivers and lakes or of ecological imbalance

#### **5. Republic Act 8435 – Agriculture and Fishery Modernization Act (AFMA)**

This act prescribes urgent related measures to modernize the agriculture and fisheries sectors of the country in order to enhance their profitability and prepare said sectors for the challenges of globalization through an adequate, focused and rational delivery of necessary support services.

Section 6. Network of Areas for Agricultural and Agri-Industrial Development. The Department, shall within six (6) months after the approval of this Act, and in consultation with the local government units, appropriate government agencies, concerned non-government organizations (NGOs) and organized farmers' and fisherfolks' groups, identify the Strategic agriculture and Fisheries Development Zones (SAFDZ) within the network of protected areas for agricultural and agro-industrial development to ensure that lands are efficiently and sustainably utilized for food and non-food production and agro-industrialization.

#### **6. MC 54 dated June 8, 1993 – Prescribing the guidelines governing Section 20 of R.A. 7160, otherwise known as the Local Government Code of 1991, authorizing cities and municipalities to reclassify agricultural lands into non-agricultural uses, however, Section C and Section I, state that such reclassification shall be limited to a maximum of the percentage of the total agricultural land of a city or municipality as follows:**

- For highly urbanized and independent component cities, fifteen percent (15%)
- For component cities and first class municipalities, ten percent (10%)

- For fourth to sixth class municipalities, five percent (5%).

Provided that agricultural lands distributed to Agrarian Reform Beneficiaries pursuant to R.A. 6657, otherwise known as the Comprehensive Agrarian Reform Law shall not be affected by the said reclassification and the conversion of such lands into other purposes shall be governed by Section 65 of the said Act.

- 7. Executive Order 124, dated Sept. 8, 1993** - Establishing priorities and procedures in evaluating areas for land conversion in Regional Agri-Industrial Centers, Tourism Development areas and sites for Socialized Housing projects.
- 8. Administrative Order No. 20** or the Interim Guidelines on Agricultural Land Use Conversion (series of 1992) provides that all irrigated and economically irrigable lands covered with irrigation projects with firm funding commitments shall be non-negotiable for conversion.
- 9. Administrative Order No. 4 series of 1994 of the Department of Agrarian Reform** provides the guideline on areas targeted for tourism development covered under the agrarian reform program. One of the provisions is that 50% of the total CARP areas is to remain as agricultural area.
- 10. RA 6675 otherwise known as the Comprehensive Agrarian Reform Program.** An act instituting a program to promote social justice and industrialization and provides a mechanism for its implementation.
- 11. E.O 124 series of 1993** defining priority areas for land use conversion. That priority areas for land use conversion are Regional Agri-Industrial Growth Centers (RAICs) identified by the Department of Trade and Industry (DTI) and the Department of Agriculture (DA), Tourism Development Areas (TDAs) identified by the Department of Tourism (DOT) and sites identified by the Local Government Units to socialized housing which are presently used for agricultural purposes which need conversion approval from the Department of Agrarian Reform (DAR) prior to a change in use.
- 12. RA 7586 otherwise known as the NIPAS Act** – an act providing for the establishment and management of National Integrated Protected Area System (NIPAS) in order to maintain the essential processes and life support system to preserve genetic diversity to ensure sustainable use of resources found therein, and to maintain their natural condition to the greatest extent possible.
- 13. P.D. 389 otherwise known as the Forestry Reform Code** authorizes the President of the Philippines by proclamation upon recommendation of the director to declare all lands of the public domain eighteen percent (18%) in slope or over as permanent forest or forest reserves, regardless of the condition of the vegetation cover, occupancy or use of any kind, and thereafter such forest shall not be alienated or disposed of, but shall remain in public ownership as such as forest uses.

Section 18 – areas within timber concession between 18% in slope, which is timberland and or have adequate residual stocking and presently supporting a

processing plant shall not be released as alienable and disposable but shall remain as part of the permanent forest land.

Section 22 – Local government may acquire private or public land for the purpose of establishing a municipal or city forest, Tree Park, watershed or pasture land. Those lands to be considered are the parcels of land less than 18% in slope and less than 250 hectares, regardless of size which is found within or surrounded wholly or partly by the body of public forest. A strip of land 50 meters above normal high water line on each site of rivers and streams which channels are less than 5 meters wide shall be retained as permanent forest for streams bank protection. For shoreline protection, strips of land, mangrove and swampland not less than 50 meters from the shoreline shall be retained as permanent forest.

**14. P.D. 705, Amended Forestry Reform Code** – This provides for a system of land classification into agricultural, industrial or commercial, residential, resettlements, mineral, timber or forest or grazing lands, and into such other classes as may hereafter be provided by law, rules and regulations.

Section 15 further states that no land of the public domain 18% in slope or over shall be classified as alienable and disposable, nor any forest land 50% in slope as grazing land.

**15. P.D 1157, Philippine Environmental Code** – It mandates the undertaking of environmental impact assessments for all projects which may significantly affect the environment.

**16. P.D 1152** – Establishes specific environmental management policies and prescribes environmental quality standards to provide the structures to pursue a comprehensive program on environmental management.

**17. P.D 1067, Water Code of the Philippines** – prohibits the intrusion of sewerage, industrial wastes or any substance that may pollute source of water supply. It also penalizes dumping of mine tailings and sediments into rivers and waterways.

For easement requirements:

1. Along banks of rivers, streams and other waterways shall have the following easement throughout their entire lengths for maintenance and emergency operation purposes.
  - a. For creeks in urban and rural areas and subject to overbank flows, a minimum easement of 4.50 meters shall be provided that will measure from the edge of existing bank or the improved bank.
  - b. Rivers, esteros and navigation canals, not subject to overbank flows, shall have minimum easements of 5.50 meters measured from the edge of existing bank or the improved bank. These above easements may however, be increased depending upon the type of channel improvement that will be instituted if the waterway overflows its banks and also in the public improvement plan that will be proposed for the strip of land bordering the waterways.



- c. In agricultural and forested areas, a minimum of 20 meters and 40 meters easement respectively, shall be required and measured from the upper banks of the rivers or streams (Art. 51)
2. Shores of lakes, seas and other inland bodies of water shall have the following easement throughout their entire lengths for the purpose of recreation, flood control, etc.
    - a. In urban and rural areas, a three to six meter easement shall be provided, measured from the water edge at maximum water level or tide level.
    - b. For agricultural and forested areas, twenty meters and forty meters easements, respectively shall be provided, measured from the water edge at maximum water or tide level.

**18. Republic Act No. 8550**

Known as the “Fisheries Code”, this Act was passed to achieve food security as the overriding consideration. The law provides for the utilization, management, development, conservation and protection of fishery resources in order to provide the food needs of the population. This is a flexible policy towards the attainment of food security that shall be adopted in response to changes in demographic trends for fish, emerging trends in the trade of fish and other aquatic products in domestic and international markets, and the law of supply and demand.

**19. Republic Act 8749**

Known as the “Philippine Clean Air Act of 1999”, this is an Act which provides for a comprehensive air pollution control policy and for other purposes in order to protect and advance the right of the people to balanced and healthy ecology in accord with the rhythm and harmony of nature and to attain sustainable development.

**20. Republic Act No. 9003**

This is an Act that provides for the adoption of a systematic, comprehensive, ecological solid waste management program that will ensure the protection of public health and the environment. All LGUs are expected to comply with the regulations provided under the law. Satisfying the requirements for operating controlled dumpsites for solid waste in accordance with the minimum prescribed standards of site operation shall be undertaken. In addition, the implementation of RA 6969 or the Hazardous Waste Management Act will be monitored.

#### 4.5 Disaster Risk and Vulnerability Assessment Affecting the Economic Sector

The Hyogo Framework for Action 2005-2015 states, “The starting point for reducing disaster risk ... lies in the knowledge of the hazards and the physical, social, economic and environmental vulnerabilities ... and of the ways in which hazards and vulnerabilities are changing in the short and long term, followed by action taken on the basis of that knowledge” (UNDP 2010).

The interactions between natural or human-induced hazards and vulnerable conditions create harmful consequences namely, casualties, damaged properties lost livelihoods, disruptive economic activities and damage to environment. A comprehensive risk assessment will not only evaluate the degree and possibility of potential losses but it also provides complete understanding of the causes and impact of those losses. Hence, risk assessment is an essential element of decision and policy-making processes that require strong collaboration among various segments of society (UNDP 2010).

The province of Davao del Norte has identified the following disaster risks: flood hazard exposure, rain induced landslides (RIL), earthquake induced landslides (EIL), ground shaking and liquefaction. Discussion of these risks will aid both planners and policy-makers in identifying vulnerable areas while anticipating with ample preparedness the onset and impacts of disasters particularly to the economic sector.

##### 4.5.1 Flood Hazard Exposure

Basically, there are two causes for flood hazard namely, a) the increased frequency of extreme weather events probably because of climate change, and b) built-up areas (example: urbanization and infrastructures) continue to grow largely in flood prone areas. The combination of these two is very alarming because changes in land use associated with urban development affect flooding in many ways. Urbanization generally increases the size and frequency of floods and may expose communities to increasing flood hazards (Lugeri, et al 2006).

As earlier discussed in this chapter, the province’s economy is anchored on agriculture and the production of important crops. Around 150,836 hectares or 47.30% of the total land area of the province is devoted to crop production. Based on these figures, an estimated 20.34% of the province’s agricultural land (30,836 hectares) is highly at risk to flood. The municipality of Carmen has the highest susceptibility to flood as 46.75% (6,908 hectares) of its agricultural land lies underwater when flood occurs. Likewise, flood exposure of Tagum City is placed at 44.97% and New Corella with 42.87%. These areas are considered rice production areas of the province. However, the Panabo City and the municipalities of Sto. Tomas and Kapalong where large banana plantations are located have less than 20% exposure to flood. The table below shows the degree of flood hazard exposure of the cities and municipalities of Davao del Norte.

*Table No. 3-79: Exposure of Agricultural Area to Flood  
By City/Municipality, as of CY 2012  
Davao del Norte*

City/Municipality	Area (has.)	Exposed	% Exposed
Asuncion	18,060	5,539.07	30.67
BE Dujli	8,584	3,177.15	37.01
Carmen	14,780	6,908.99	46.75
IGaCoS	25,600	-	-
Kapalong	14,930	1,488.65	9.97
New Corella	9,597	4,013.24	41.82
Panabo City	16,140	1,840.59	11.40
San Isidro	12,470	469.54	3.77
Sto.Tomas	16,000	2,592.03	16.20
Tagum	10,360	4,658.54	44.97
Talaingod	4,315	0.0	-
<b>TOTAL</b>	<b>150,836.00</b>	<b>30,687.79</b>	<b>20.34%</b>

*Source : PPDO GIS Division, Province of Davao del Norte*

Past flooding experiences in the province have caused destruction of crops and loss of livestock. The cost of damage was estimated to reach P 115.5 Million in 2011, P 2.9 Billion in 2012 and P 128.4 Million in 2013. Moreover, the occurrence of floods reduces farm productivity, causes shortages in food supply and escalates the prices of basic commodities.

Families living in flood-prone areas usually suffer temporary displacement and disrupted livelihood activities. In 2013, Typhoon Crising had affected a total of 4,451 families. The following table shows the flood occurrences in 3 years and the corresponding impact to communities and livelihood.

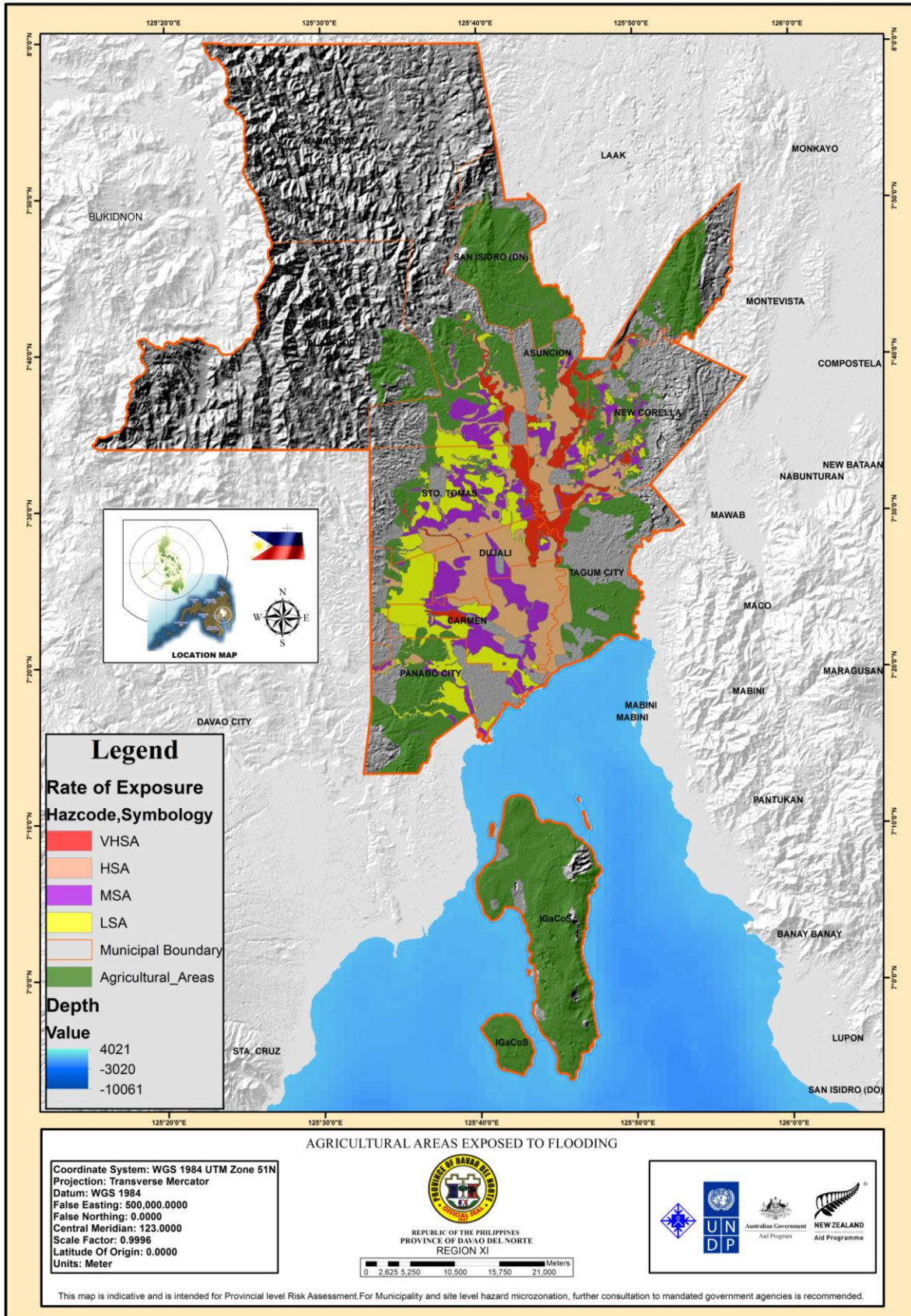
*Table No. 3-80. Flood Occurrences  
Province of Davao del Norte  
CY20 11-2013*

Date of Occurrences	LGUs Affected	No. of Brys Affected	No. of Families Affected	No. of Families Evacuated	Agri'l Areas Affected (Has)	Amount of Damage to Crops/ livestock/ fisheries (P)
2011	7	24	14,699		-	115,595,477.00
2012	18	147	62,660		-	2,898,293,866.00
2013	8	55	32,492	4,451	5,635.07	128,341,499.30

*Source : PPDO GIS Division, Province of Davao del Norte*

For better appreciation, a map below presents the agricultural areas that are exposed to certain degrees of flooding.

Map No. 26. Agricultural Land Exposed to Flooding Province of Davao del Norte



Source: PPDO GIS Division, Province of Davao del Norte



#### 4.5.2 Rain Induced Landslide (RIL)

Rainfall most often triggers landslides especially in areas having tropical climate, which is characterized by very intense long duration rainy seasons. In low permeability clayey soils, the pore-water pressure builds up over a number of series of rain storms and changes the stability of slopes. It eventually culminates in the final triggering rainfall event that precipitates a failure (Siew-Ann et al, nd). Rainfall induced landslides are usually shallow slips that can cause serious damage to property and infrastructures. The rapidly moving water and debris can block roadways and can lead to adverse agricultural impacts including loss of harvest, loss of livestock and change in vegetation.

The municipality of Talaingod has 1,213.43 hectares of its agricultural area exposed moderately to rain induced landslide (11% susceptibility) because of its high elevation. Highly exposed areas are found in Asuncion covering about 865.26 hectares or 4.79% of its total area of 18,058.09 hectares, while Sto. Tomas have a flood exposed area of 207.46 hectares out of the total 16,002 hectares land area. The rest of the cities and municipalities have moderate to low exposure.

Table No. 3-81. **Agricultural Area Exposed to Rain Induced Landslide (RIL)  
By City and Municipality, Davao del Norte: CY 2012**

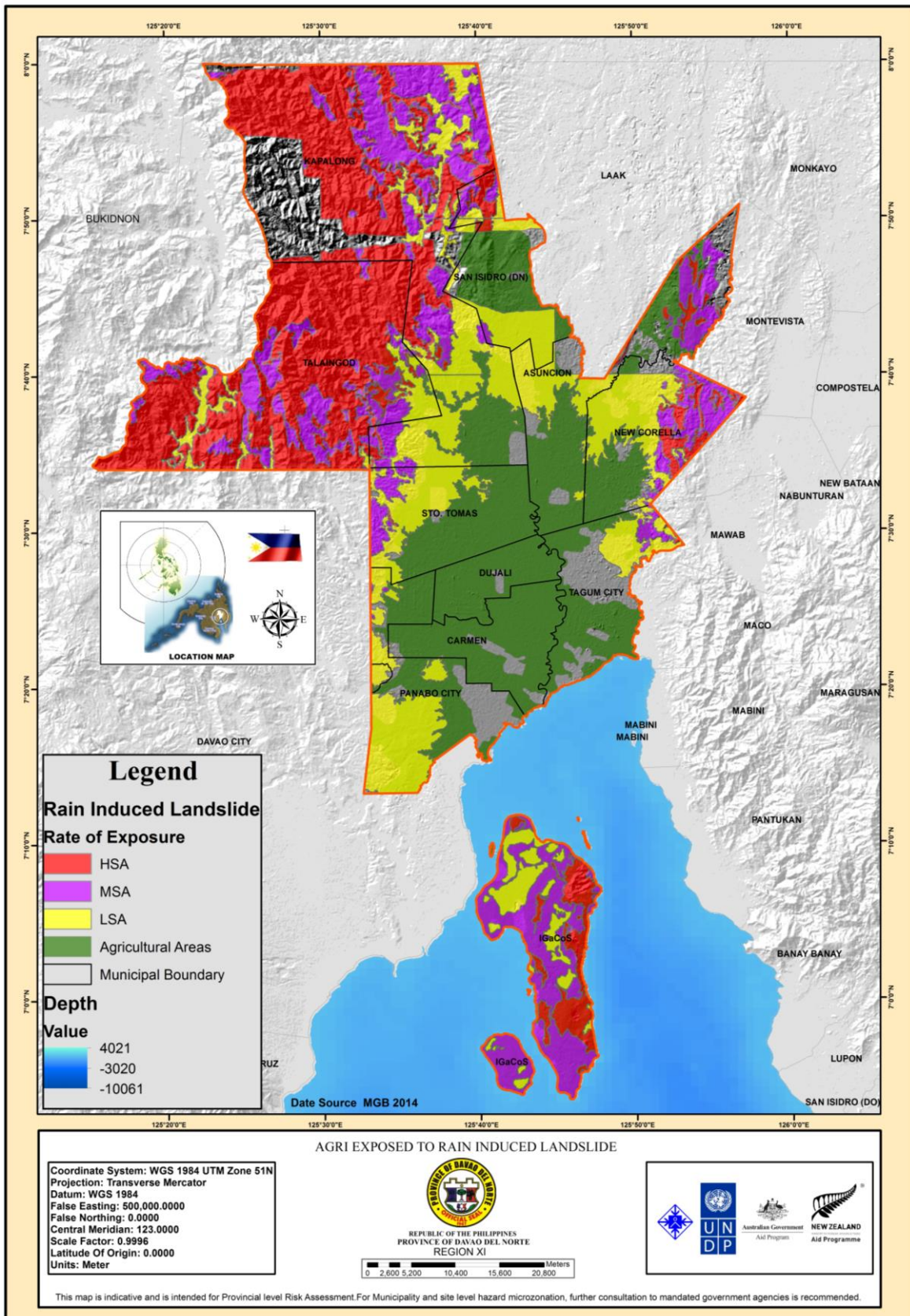
LGU	Total Municipal Agricultural Area	Exposed Agricultural Area within HSA	Exposed Agricultural Area within MSA	Exposed Agricultural Area within LSA	Exposure percentage w/in HSA	Exposure percentage w/in MSA	Exposure percentage w/in LSA
Asuncion	18,058.09	865.26	2,051.45	5,120.01	.04%	.11%	28.3%
BE Dujali	8,584.16	-	-	-			
Carmen	14,775.6	-	-	23.82			1.6%
IGaCoS	25,598.35	-	-	-			
Kapalong	14,937.3	207.46	445.01	7,927.58	01%	02%	53.07%
New Corella	9,616.434	-	30.20	4,359.91		3.14%	45.33
Panabo City	16,138.56	-	-	7,425.76			46.01%
San Isidro	12,474.51	224.43	-	4,806.98	01%		38.53%
Sto. Tomas	16,002.6	5.9	0.26	3,892.64	3.74%	1.5%	24.32%
Tagum City	10,358.97		312.16	865.19		3%	8.35%
Talaingod	4,315.339	122.69	1,2	1,818.01	02%	28%	42.12
TOTAL	150,836	1,425.83	4,052.52	36,239.92	9.45%	2.68%	24.02%

Source : PPDO GIS Division, Province of Davao del Norte

The following map of Davao del Norte illustrates its total area that is prone to rain-induced landslides.



Map No. 27. Agricultural Land Exposed to Rain-Induced Landslides Province of Davao del Norte



Source: PPDO GIS Division

### 4.5.3 Earthquake Induced Landslide (EIL)

In many parts of the world, the earthquake’s destructive impact is immensely increased by the triggering of landslides during or after shaking. It is expected that after the direct effect of structural damage brought about by strong ground-motion caused by earthquakes, landslides are the most critical consequence of earthquake shaking. This does not only cut off communications however, earthquake induced landslides can cause a significant death toll. Hence, it is required to quantitatively assess the distribution and magnitude of this major collateral hazard in order to have effective and realistic seismic risk mitigation (Bommer and Rodriguez 2001).

Based on PHILVOLCS data, no earthquake-induced landslide has ever occurred in Davao del Norte. However, the province cannot rest assured of its possible future occurrence since its neighboring province, Davao Oriental is one of the top ten provinces at risk to earthquakes due to the Philippine Trench and nearby active faults. Likewise, the provinces of Davao del Sur and Davao Oriental are also in the top ten provinces that are at risk to earthquake induced landslides (Center for Environmental Geomatics-Manila Observatory 2005).

As to exposure of the province to this hazard, the municipality of Talaingod is seen to have the highest exposure in the high susceptibility area at 33.84%, followed by San Isidro at 26.58%. It can be gleaned at the following table the degree of exposure of cities and municipalities to earthquake induced landslides.

*Table No. 3-82. Agriculture Exposed to Earthquake Induced Landslide (EIL)  
By City and Municipality, Davao del Norte  
As of CY 2012*

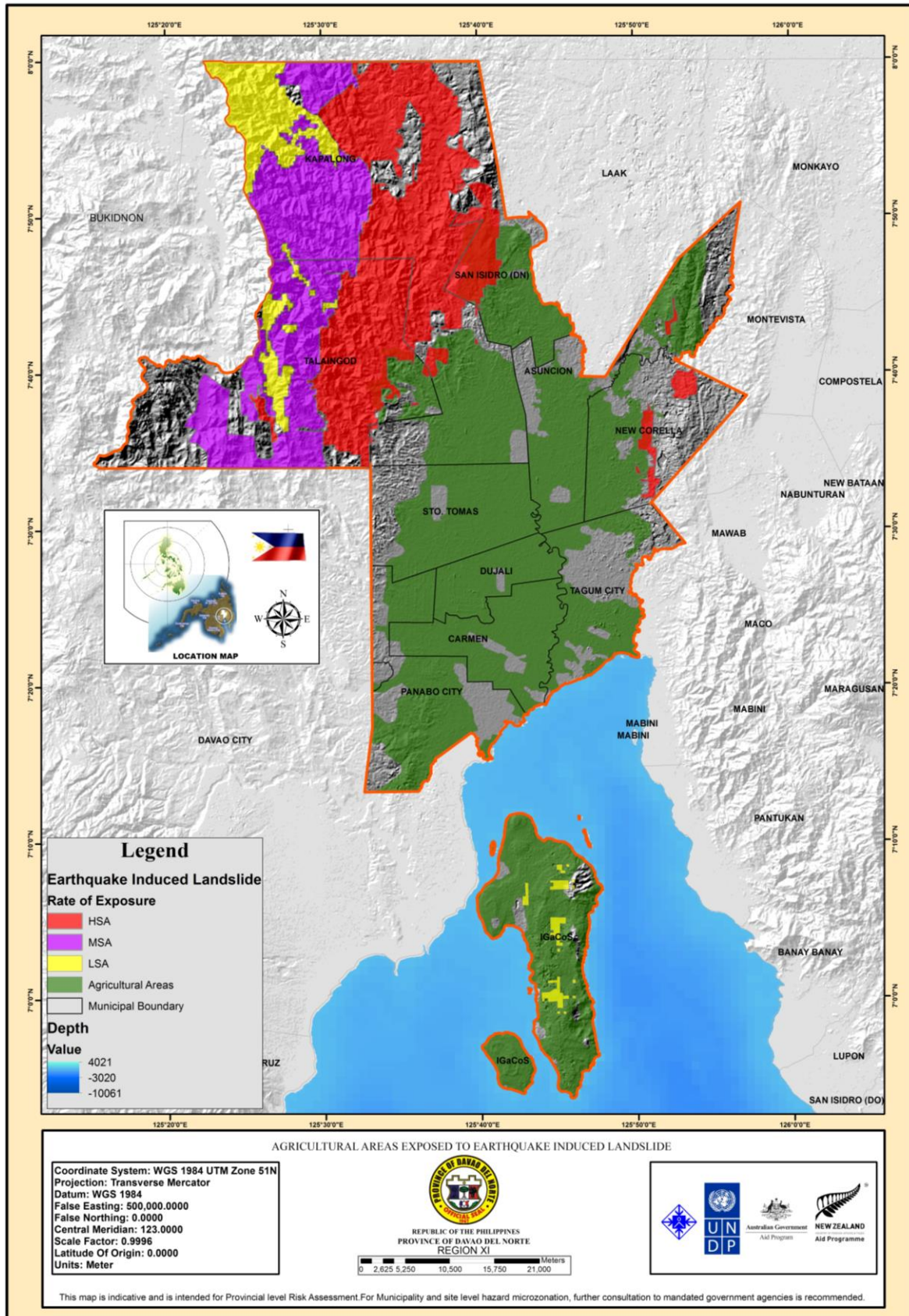
City/ Municipality	Total Municipal Agricultural Area	Exposed Agricultural Area within HSA	Exposed Agricultural Area within MSA	Exposed Agricultural Area within LSA	Exposure percentage w/in HSA	Exposure percent- tage w/in MSA	Exposure percent- tage w/in LSA
Asuncion	18,058.090	246.080			1.36%		
BE Dujali	8,584.169						
Carmen	14,775.600						
IGaCoS	25,598.350			1,371.310			5.35%
Kapalong	14,937.300	872.650			5.84%		
New Corella	9,616.434	539.490			5.61%		
Panabo City	16,138.560						
San Isidro	12,474.510	3,316.630			26.58%		
Sto. Tomas	16,002.600						
Tagum City	10,358.970						
Talaingod	4,315.339	1,460.670			33.84%		
<b>TOTAL</b>	<b>150,836.00</b>	<b>6,434.540</b>	<b>-</b>	<b>1,371.310</b>	<b>4.27%</b>	<b>-</b>	<b>4.26%</b>

*Source : PPDO GIS Division, Province of Davao del Norte*

Also in the map that follows is a visual presentation of areas that can be subjected to earthquake induced landslides in the province.



Map 28. Agricultural Areas Exposed to Earthquake Induced Landslides  
Province of Davao del Norte



Source : PPDO GIS Division

#### 4.5.4 Ground Shaking

Whenever there is an earthquake, the earthquake waves cause the earth to shake and radiate energy that had been stored in stressed rocks. This energy is released when a fault breaks and the rocks slipped to release the confined stress. The strength of ground shaking can be measured in the velocity of ground motion, the acceleration of ground motion, the frequency content of the shaking and how long the shaking continues (the "duration"). This triggers other hazards such as liquefaction and landslides.

In Davao del Norte, around 95.52 % of the total agricultural area of the province is prone to ground shaking. The most exposed of the LGUs is Tagum City having 98%, followed by Kapalong at 91% and New Corella at 80%. Only Panabo City has no area exposed to ground shaking hazard. The following table presents the percent exposure by city and municipality of the province.

*Table No. 3-83: Agriculture Area Exposed to Ground Shaking Hazard  
By City and Municipality, Davao del Norte: CY 2012*

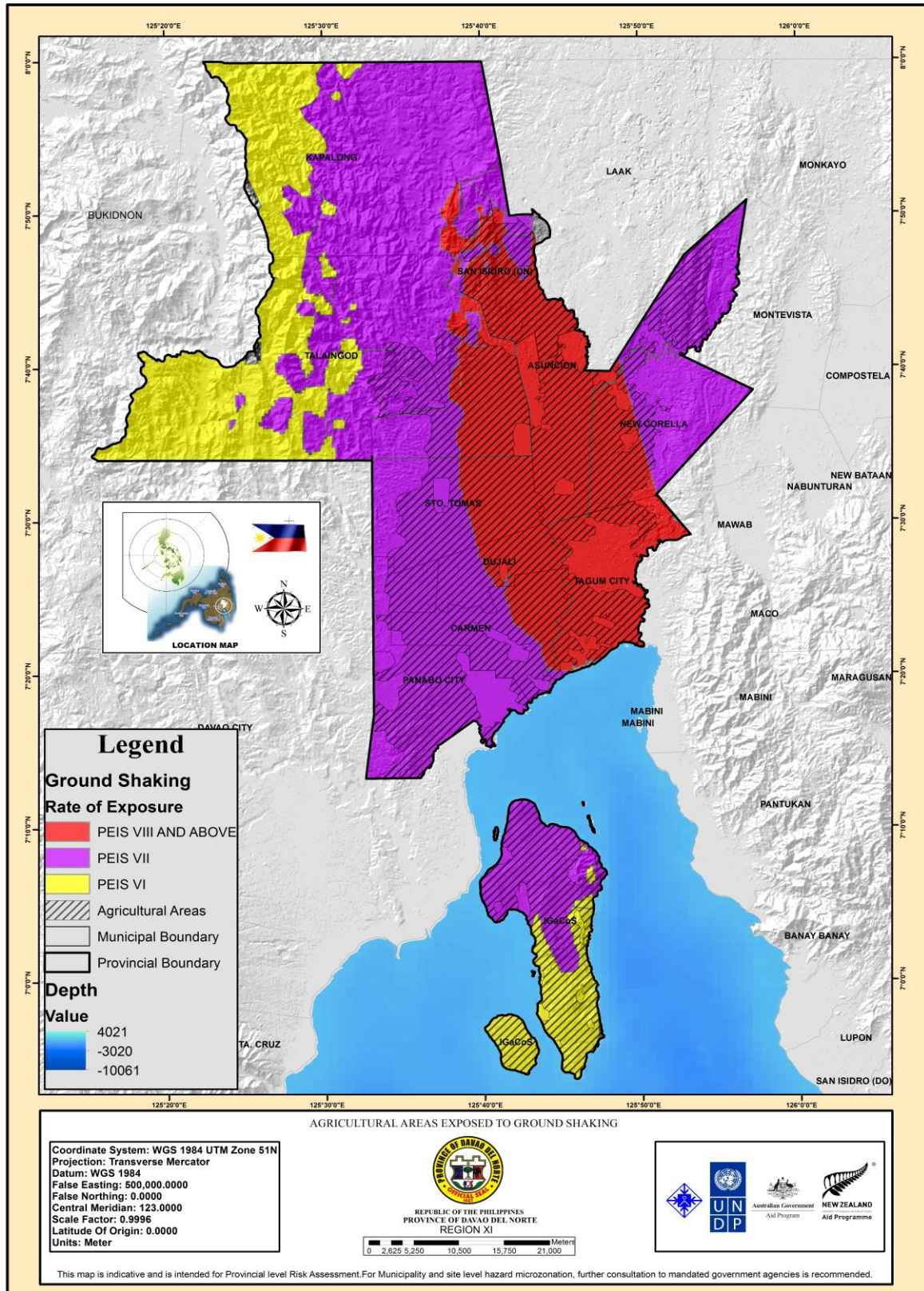
City/Municipality	Total Agricultural Area (Has.)	Exposed Agricultural Area	Exposure percentage
Asuncion	18,058.090	11,423.76	63%
BE Dujali	8,584.169	5,062.01	59%
Carmen	14,775.600	6,408.65	43%
IGaCoS	25,598.350	11,653.81	45%
Kapalong	14,937.300	13,741.42	91%
New Corella	9,616.434	7,785.96	80%
Panabo City	16,138.560	0	0
San Isidro	12,474.510	9,766.02	78%
Sto. Tomas	16,002.600	10,071.39	62%
Tagum City	10,358.970	10,186.76	98%
Talaingod	4,315.339	376.41	08%
<b>TOTAL</b>	<b>150,836.000</b>	<b>144,082.58</b>	<b>95.52%</b>

*Source : PPDO GIS Division, Province of Davao del Norte*

The map on the next page shows the exposure to ground shaking by cities and municipalities of Davao del Norte.



Map 29. Agricultural Areas Exposed to Ground Shaking  
 Province of Davao del Norte



Source: PPDO GIS Division



#### 4.5.5 Liquefaction

Liquefaction is the process by which water-saturated sediment temporarily loses strength and acts as a fluid. This effect can be caused by earthquake shaking.

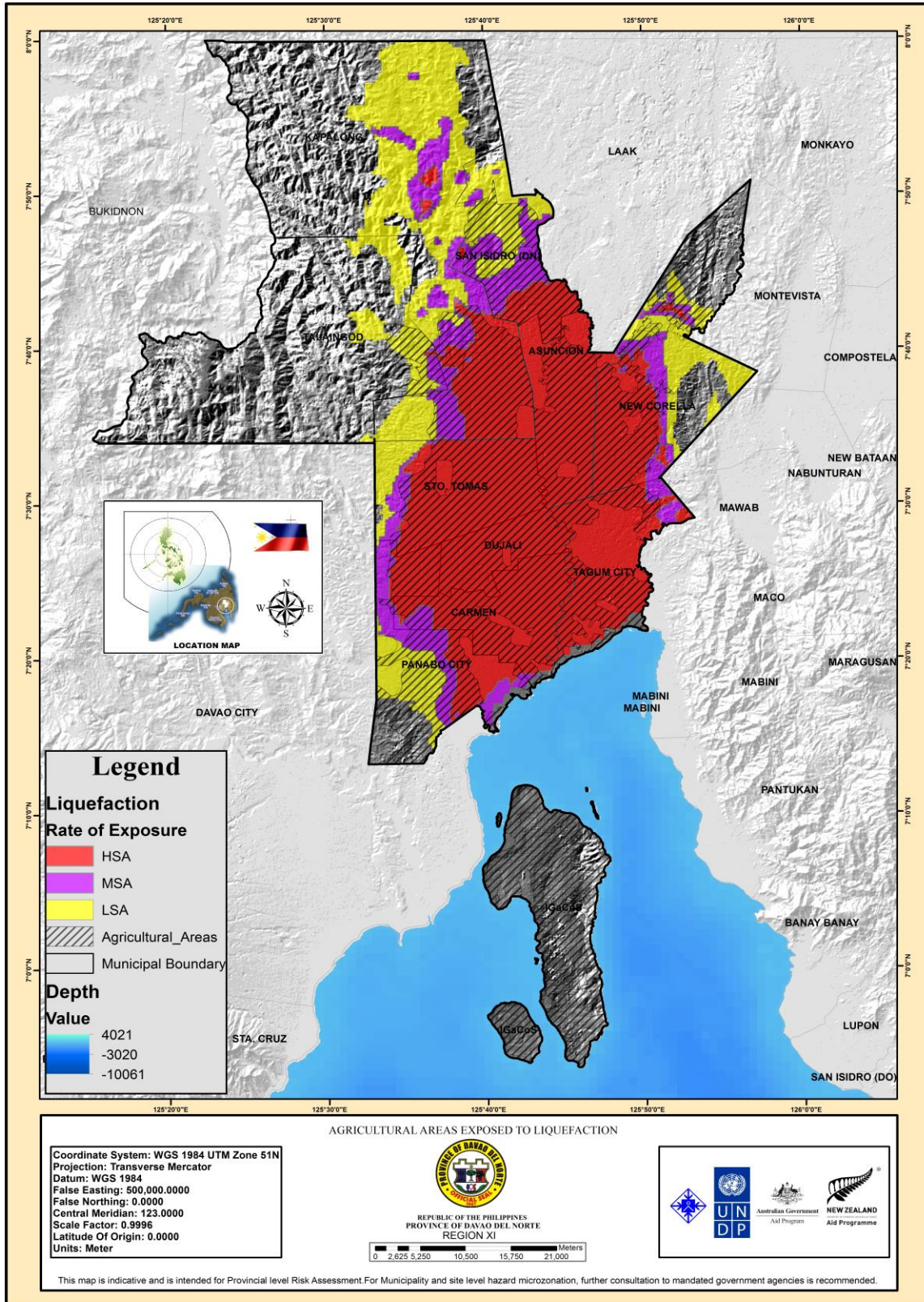
Table No. 3-84. **Agriculture Area Exposed to Liquefaction  
By City and Municipality, Davao del Norte  
CY 2012**

City/ Municipality	Total Municipal Agricultural Area	Exposed Agricultural Area within HSA	Exposed Agricultural Area within MSA	Exposed Agricultural Area within LSA	Exposure percen- tage w/in HSA	Exposure percen- tage w/in MSA	Exposure percen- tage w/in LSA
Asuncion	18,058.090	11,662.52	835.36	1,884.57	65	5	10
BE Dujali	8,584.169	8,584.17	-	-	100	-	-
Carmen	14,775.600	13,682.77	840.63	74.27	93	6	1
Kapalong	14,937.300	10,406.16	3,478.07	1,053.07	70	23	7
New Corella	9,616.434	8,743.86	653.88	218.69	91	7	2
Panabo City	16,138.560	5,671.18	3,092.31	3,934.14	35	19	24
San Isidro	12,474.510	3,988.29	4,739.34	3,746.88	32	38	30
Sto. Tomas	16,002.600	15,475.11	527.49	26.54	97	3	0
Tagum City	10,358.970	9,456.74	124.93	-	91	1	0
Talaingod	4,315.339	66.03	576.95	2,130.99	2	13	49

Source : PPDO GIS Division, Province of Davao del Norte

The municipality of B.E Duajli has the highest exposure percentage within high susceptibility area at 100% followed by Sto. Tomas at 97%, Carmen at 93% and Tagum City and New Corella at 91%. The Map 30 shows the areas of probable liquefaction in the province

*Map 30. Agricultural Areas Exposed to Liquefaction Province of Davao del Norte*



Source : PPDO GIS Division

**4.5.6 Vulnerability of Agriculture Sector**

In determining the vulnerability of agriculture sector (crop production) to flood the indicator used for sensitivity is slope class and forest cover. The indicators of exposure are the extent of flooded areas and duration of floodwaters. For the adaptive capacity, indicators used are access to planting calendars and updated maps of flood prone areas.

The Municipalities of Asuncion, Carmen, Kapalong and New Corella and the City of Tagum have moderate vulnerability to flood while the rest of municipalities have low vulnerability. Flood control projects have been implemented to reduce flooding and flood damage which has been an almost yearly occurrence in these municipalities. The table below presents the degree of vulnerability of cities and municipalities to flooding.

*Table No. 3-85. Level of Vulnerability of Agriculture Sector (crop production) to Flood By City and Municipality, Province of Davao del Norte: CY 2012*

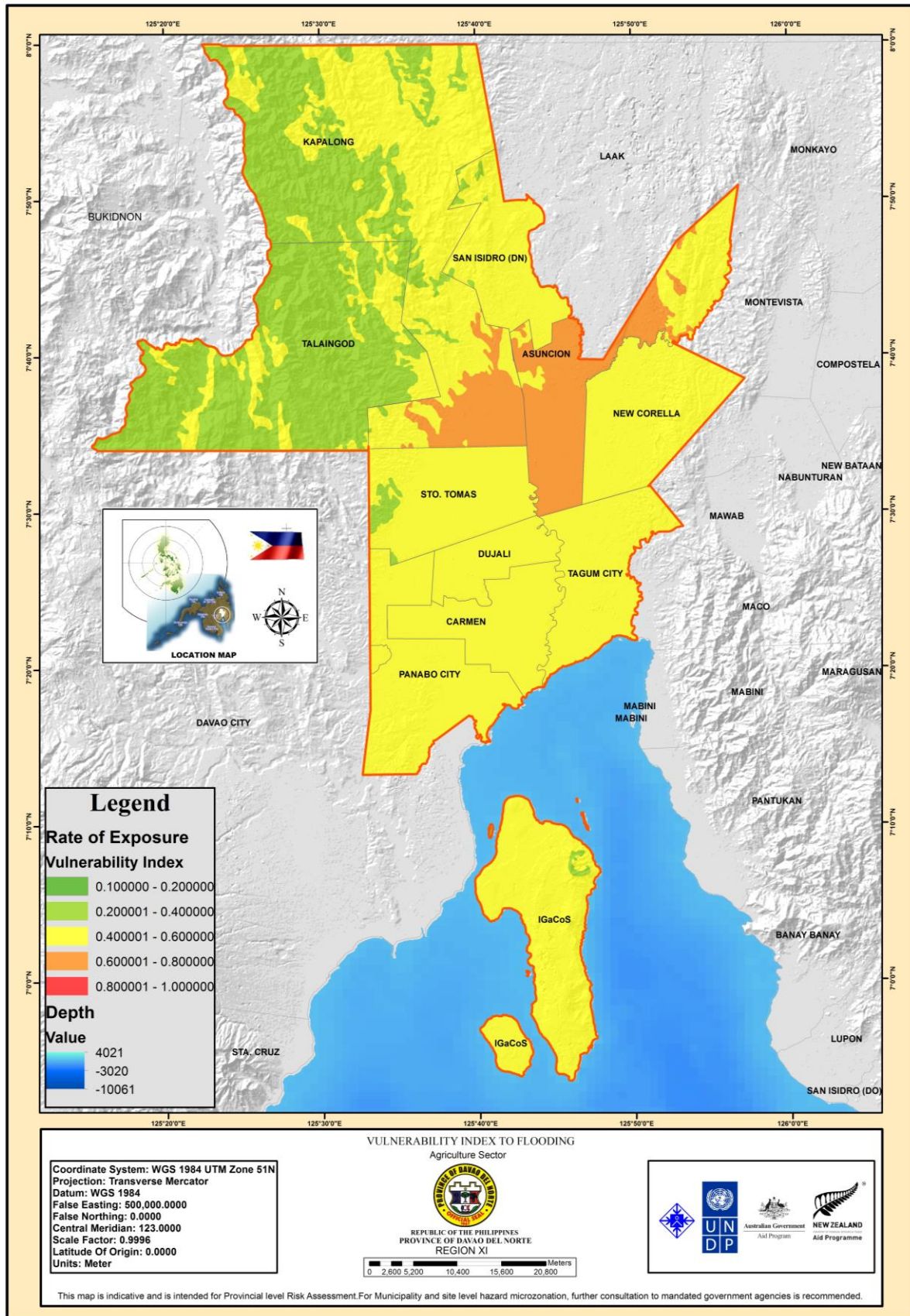
City/Municipality	Sensitivity Value (Weighted Average)	Exposure Value (Weighted Average)	Adaptive Capacity Value (Weighted Average)	Vulnerability Index (Weighted Average)	Vulnerability Category
Asuncion	0.48	0.49	0.67	0.603	High
BE Dujali	0.66	0.36	0.67	0.558	Moderate
Carmen	0.54	0.46	0.54	0.593	Moderate
IGaCoS	0.36	0.36	0.67	0.453	Moderate
Kapalong	0.36	0.49	0.54	0.603	High
New Corella	0.48	0.46	0.54	0.593	Moderate
Panabo City	0.48	0.36	0.67	0.482	Moderate
San Isidro	0.36	0.36	0.54	0.457	Moderate
Sto. Tomas	0.42	0.36	0.54	0.478	Moderate
Tagum City	0.60	0.46	0.67	0.593	Moderate
Talaingod	0.36	0.36	0.54	0.429	Moderate

*Source : PPDO GIS Division, Province of Davao del Norte*

The vulnerability of LGUs can best be appreciated with the map provided in Map 31.



**Province of Davao del Norte**



Source : PPDO GIS Division

**4.6 Issues and Challenges with Underlying Causes**

#### **4.6.1 Agriculture**

##### **a. Crops**

- Low farms production and productivity because farmers are not receptive to new technologies being introduced, especially in the absence of concrete proof of the efficacy/effectiveness of introduced technologies while others have exhibited reluctance and some are slow to adopt them. Low productivity is also attributed to lack of access road (FMR).
- Lack of capabilities of stakeholders to engage in productivity-enhancing measures, agriculture-related industry development, and other profit enhancing activities due to mismanaged associations resulting to failure of livelihood support and lack of education /training.
- Pest and disease infestation due to ecological imbalance, flood and excessive dependence on synthetic pest control.
- Decreasing sufficiency in staple food due to crop shifting because land owners' perception of higher income.
- Inappropriate and lack of postharvest facilities (PHF). There are PHFs that were distributed but not operational. There is a high percentage of postharvest losses. Farmers can only demand a good and profitable price for their produce when sold in volume.
- Most farmers have limited access to formal credit and marketing linkages. Because of this, farmers tend to borrow from traders at higher interest rates and are even forced to sell their produce to pay-off debts.
- Occurrence of floods, drought and other environmental hazards due to climate change threaten productivity in agriculture and aqua culture industry.

##### **b. Livestock**

- Limited opportunity to export livestock, poultry and by-products because the existing abattoir/slaughter house and cold storage have not met the Triple A standards.
- Low productivity is attributed to inadequate technology, the lack of awareness and opportunities offered to backyard raisers resulting to their having difficulties in meeting prescribed export standards.
- Limited investors in livestock and poultry commercial farming due to high cost of inputs, land conversion (conversion of agricultural to residential zone), unstable



market price (low farm gate price due to middlemen) and defeated purpose of auction centers.

- Low Productivity and income due to small capital, limited access to funding institutions, traditional management preference of L & P farmers and only few investors ventured in commercial scale livestock/poultry production.

### **C. Fisheries**

- The need for land-based facilities such as ice plant, cold storage, feed storage, docking area & one-stop operation center to support the Panabo City Mariculture Park. The park is producing Bangus which has a high export potential. In order to meet the requirements of the export market a permanent site of the fish landing center is required.
- Unstable market price of bangus especially during lean months from May to September.
- Lack of packaging technology.
- Limited supply of quality fingerlings due to high demand from other mariculture areas in Davao Sur, Davao Oriental, Compostela Valley, Surigao and Tacloban City.
- High cost of production inputs such as fingerlings, feeds and construction materials. Cost of feeds in particular is fluctuating.
- Lack of financing support because many fisher folk organizations cannot meet the requirements of financial institutions.

#### **4.6.2 Wood**

- Inadequate supply of wood products due to imposition of Executive Order No. 23 and diminishing supply. (With the log ban imposed by the President through EO No. 23, supply of timber from natural forest and plantation stand has drastically plunged hurting the wood industry. The harvesting of natural timber from CBFM areas and from titled properties with Private Forest Development Agreement (PFDA) and Special Private Land Timber Permit was effectively ban and legal sources of timber from private tree plantation is heavily regulated resulting to reduced production, marketing and movement of timber within the province. The imposition of EO 23, hopes to reduce pressure on natural forest since its capacity to produce timber is tremendously reduced due to shifting cultivation and illegal logging.)
- Inefficient operation of many wood-based industries incurring high production/processing wastages. (In a mill study conducted by PENRO in 2013, it revealed that in one veneer production plant, the log input of 5.13 cu.m. yielded 16.56% lower than the predicted output of 3.015 cu.m. in 87.48 minutes of operation. The downtime of 57 minutes and 2 second is unacceptable in any industry

standard. It shows that 65% of the operation time is devoted to non-production and this can be attributed to poor plant lay-out and processes and inefficient tools and equipment. The downtime is also aggravated by poor quality of logs delivered at mill site which can be characterized as rotten, crook, curve, and mostly pulp grade (small diameter) logs.

- Poor quality of timber produced in plantations. (The mill study revealed that 82% of the selected log input belonged to small diameter class (pulpwood and saw timber) and only 18% can be truly be classified as veneer blocks or large diameter logs. This would mean that good quality logs are getting scarce and deliveries from local sources are getting smaller in diameter and this can be due to early or immature harvest of plantation timber crops. On the other hand, field observations disclosed that, tree farmers are not particular in using quality seeds or buying quality tree seedlings from reputable nurseries, neither undertakes good silvicultural practices to improve the quality of timber hence most plantation produced lower yields.
- Lack of Research and Development in processing wood-based products due to insufficient funds. (Only one wood processing plant (WPP) in Davao del Norte out of 18 registered and active WPP is regularly producing export quality wood (knocked down parts and consumer products) to Europe, USA and Japan passing international standards of quality and sustainable source. This plant has invested and maintained its own research and development (R & D) and utilizes outputs of other research institutions such as the Forest Resources Development Institute (FRDI) to enrich their capabilities. The rest of the list of WPPs are not investing and maintaining their own R & D since they are only use to market raw lumber, pallet boards or banana crates.
- Progressing deforestation, poverty and exploitation of IPs weaknesses in domain management. (Influx of lowland migrants is a social and environmental concern since the national government shut down the TLA system more than 25 years ago. Government programs such as the community-based forest management and ancestral domain management which are policy instruments for the sustainable management of forest lands, including control of land conversion and intrusion into protected areas identified by the community have not shown any sign that migration into these areas have stopped. Yet, due to poverty, many migrants and even members of the indigenous community have continued to exploit the common resources within. Cutting of trees and selling them, and selling the land already cleared are the most easy way to address their financial needs and if poverty persists and without radical change of the mindset of the leaders of the IP community to protect their domain from abuse, then deforestation will continue to occur.
- Inability to sustain anti-illegal logging campaign due to lack of funds. (Government's priority in fund allocation for direct forest protection activities is still at low level and inadequate despite of increasing allocation in the last 5 years. The NGP, which aimed to improve the production capacity of upland communities and divert their attention from exploiting the forest is an indirect approach and investment in forest

protection. But with the pacing out of the NGP, it is hoped that the next administration will continue to invest in reforestation programs as well as additional funding for forest protection and law enforcement activities, including sustained prosecution of offenders.

#### **4.6.3 Industry/Trading and Services**

- Lack of employment opportunities due to limited number of medium and large scale industries given the lack of PEZA zones and investment incentives in the province, slow growth of micro-enterprises and human resource and industry needs mismatch.
- High cost of doing business attributed to the voluminous requirements in getting business permits and licenses as well as the high cost of rentals, taxes and utilities.
- Low productivity and competitiveness of local MSMEs brought about by the following:
  - lack of knowledge and skills on value-adding techniques and innovativeness;
  - lack of facilities or machineries that will increase productivity and efficiency;
  - difficulty in meeting regulatory requirements such as FDA-License to Operate (LTO), Food Safety mandates, NMIS requirements, among others due to lack of awareness and high cost to comply the regulatory requirements;
  - Lack of access to financing; and
  - Inadequate knowledge on business and financial management.
- Lack of competitive advantage of local products because of lack of compliance to safety and quality standards and high prices of local products compared to imported products.
- Limited access to market because of lack of backward and forward linkages.
- Lack of disaster preparedness and response and adoption among businesses.
- Lack of backward and forward linkages due to inadequate R & D and reluctance to avail of government services.
- Lack of value-adding techniques due to limited knowledge & skills, unstable power & water supply and high cost of processing equipment and machineries.
- Challenge on doing business due to high cost of processing business permits, length of time consumed in processing documents, voluminous requirements, high rental fees and high cost of taxes.
- Lack of disaster preparedness, response and adaptation among businesses due to lack of awareness, inadequate capacities of the business sector on disaster management and adaptation.

#### **4.6.4 Tourism**

- Lack of international direct flights to Davao City, the gateway to the province of Davao del Norte. Travelers have to stop-over Singapore or Manila. This is due to the small volume of en route passengers. This discourages tourists who have to spend hours waiting for connecting flights.
- Inadequate air, sea and land connectivity to destinations.
- Inadequate destination/site infrastructure such as paved roads and tourism highway facilities to include tourist spot signage, rest stops and information centers.
- Weak LGU tourism development capacities to:
  - Develop tourism sites/product;
  - Undertake market promotion;
  - Establish Tourism Offices with technically equipped tourism officers who shall focus on tourism operations;
  - Develop tourism packaging and implement regular and reasonably priced tourism packages;
  - Formulate a Tourism Development Master Plan and Tourism Code;
  - Regulate and maintain a business-friendly environment particularly on taxes imposed on hotels and carriers;
  - Establish R & D to develop competitive iconic tourism products; and
  - Encourage local community participation.
- Lack of reliable statistics to serve as a tool in planning and policy decisions related to tourism.
- Unstable peace and order situation in Mindanao that has brought about the issuances of foreign travel advisories against coming to the region.
- Poor compliance with safety standards; destination/site security
- The occurrence of natural disasters due to climate change can potentially change or bring irreversible damage to tourism sites or cause serious injuries to tourists.

### **4.7 Goals**

#### **4.7.2 Agriculture**

##### **a. Crops**

- Increase farm production and productivity
- Capacitate and strengthen stakeholders

- Minimize effects/damage of pests and diseases
- Regulate crop shifting
- Minimize/decrease PH losses thus increasing production
- Reduce damages on agriculture brought about by the occurrence of environmental hazard

**b. Livestock**

- Promote livestock and Poultry and their by-products that meet international quality standards.
- Establishment of appropriate Production and post-production infrastructure facilities.
- Increase the volume of exportable poultry and livestock and their by-products by 5% annually.
- Encourage backyard raisers to venture in commercial farming.
- Increase productivity and income

**c. Fisheries**

- Ensure good quality fishery products for local and export market
- Improve marketing system of fishery products
- Develop alternate market re: Export
- Ensure continuous supply of fingerlings
- Reduce high cost of production inputs
- Easy access to GFIs and private institutions

**4.7.3 Wood Industry**

- Encourage forest investment for timber production.(Public & Private)
- Minimize illegal cutting of trees and other forest products

**4.7.4 Industry/Trading and Services**

- Increase inflow of big ticket investments relative to trade and industry.
- Increase the number of newly developed micro enterprises and maintain business expansion of existing enterprises.
- Lessen the gap between human resource and industry needs mismatch.
- Provision of a more business-enabling environment conducive to business growth
- Increase productivity and competitiveness of local MSMEs.
- Increase competitiveness of local products to compete with other ASEAN and imported products.
- Expand market opportunities in the local and international market.
- Resilient business sector on events of calamities and disaster.

**4.7.5 Tourism**



- An environment and social-friendly tourism that provides widespread income and employment opportunities through increasing tourist arrivals by 25,000 increasing the income from tourism by Php 87.5 Million annually and employing 5,000 people by 2022.”

## **4.8 Objectives**

### **4.8.1 Agriculture**

#### **a. Crops**

- Improved production of major agricultural crops by 8 % at the end of 2022.
  - a. Banana – 10%
  - b. Rice – 2%
  - c. Corn – 10%
  
- Minor industries:
  - a. Mango – 10%
  - b. Cacao – 10%
  - c. Coffee – 10%
  - d. Durian – 10%
  - e. Fish – 2%
  
- To enhance the capability of 8% of agriculture stakeholders by the end of 2022.
  - a) Rice – 1%
  - b) Corn 10%
  - c) Vegetables – 10%
  - d) Mango - 5%
  - e) Cacao – 10%
  - f) Banana (Cavendish and Banana) – 15%
  - g) Fish 5 %
  
- To minimized effects of plant pest and disease by 5% by the end of 2022.
- To decrease the percentage rate of crop shifting from 2%in 2013 to1% in 2022 in the case of banana to rice and rice to banana.
- To minimize PH losses by 15% in 2013 to 13% in 2022.
- To provide 9 farmer organizations access to financial institutions yearly.
- To establish regular market linkages for Cavendish and cardava banana, mango, cacao and durian).
- To mitigate/reduce damage on agriculture by 5%.
- Secure investment at 80% by 2017.

#### **b. Livestock**

- To scout/match additional international market by 5% for livestock and poultry and their by-products.

- To design and construct ISO approved production and post-production Infrastructure facilities annually.
- To upgrading of Livestock & Poultry by 10% in 2017
- To strengthen linkages with financial institution/ credit facilities yearly
- To enhance the capacity of livestock and poultry raisers and processors in 2016.
- To promote marketing strategy by 10% in 2017
- To promote multiplier farms by 5% in 2017

### **c. Fisheries**

- To provide permanent site with cold storage, ice plant, processing plant and one stop info center in 2018
- To develop ISO certified bangus processing in 2019
- To establish marketing post per LGU and buying station in the year 2017-2020
- To establish one (1) unit multi-species hatchery in 2017
- To develop locally available feeds and adopt organic farming technologies by 2017-2018
- To facilitate linkage to financing institution and private groups for fisher folk families in 2018

### **4.8.2 Wood**

- To establish and manage additional 5000 hectares of production forest.
- To reduce wastage in wood processing from 16.56% to manageable level of 10% in 2017.
- To reduce poverty in the uplands by 20% from current level (check NSO) in by providing comprehensive support to NGP beneficiaries including technology transfer, product development and market linkages.
- Intensify anti-illegal logging in all production and protection forest by increasing 20% of its budget for forest protection activities.
- Capacitate/empower 80% of the existing indigenous peoples organization and people's organizations in managing their land and forest resources.

### **4.8.3 Industry/Trading and Services**

- To increase inflow of investments by at least 15% province-wide annually.
- To increase employment generation from trade and industry by at least 15%.
- To identify and accredit at least two economic zones to the Philippine Economic Zone Authority by 2020.
- To have 100% of the LGUs enacted their respective Investment Incentive Code.
- To increase the number of newly developed MSMEs by at least 10% annually.
- To provide human resources matched to the industry needs.
- To streamline the business permits and licensing system processes by 2017
- To Formulate a sound scheme on tax collection by 2017
- To set local guidelines on establishment rental by 2017
- To capacitate at least 200 MSMEs on entrepreneurial mindset, product development, and product enhancement annually.

- To provide at least 30 Shared Service Facilities province-wide that can be benefited by at least 1,000 MSMEs by 2016.
- To increase by at least 10 % annually the number of MSMEs availing DOST's Small Enterprise Technology Upgrading Program (SETUP).
- Increase by 15% the number of food processors in the province that are compliant to Food Safety Mandates, NMIS mandates, and Halal Mandates annually.
- To increase by 10% annually the number of MSMEs that have availed of micro-financing.
- To provide trainings and seminars on business and financial management to at least 200 MSMEs annually.
- To increase by 20% the number of food processors in the province who are compliant to GMP, HACCP, and Halal by 2022.
- To increase the number of products with competitive prices available for the local and international market by 2019.
- To increase the number of products exported to the ASEAN market by 10% annually starting 2016.
- To establish an industry cluster group of key industries starting 2016.
- To provide at least 4 awareness initiatives for businesses annually.

#### **4.8.4 Tourism**

- To improve market access and connectivity
- To develop and market competitive tourist destinations and products
- To improve tourism institutional, governance and human resource capacities

### **4.9 Strategies**

#### **4.9.1 Agriculture**

##### **a. Crops**

- Promotions of matured productivity enhancement technology
- Intensify capability enhancement activities to stakeholders of priority commodities
- Strengthen province-wide farm technology models
- Pest and diseases management
- Institutionalize post-import pet risk assessment for agri & forest products liberally imported thru ASEAN Integration
- Representation and submission of resolutions and ordinances
- Provision of appropriate PHF
- Intensify/enhance access to credit facility
- Enhance productivity and develop potential areas for agricultural production
- Promotion of risk resilient crops
- Strengthen insurance coverage

##### **b. Livestock**

- International and domestic Livestock and Poultry Forum and Trade Exhibits

- Livestock and Poultry mechanization Program.
- Livestock & Poultry Development Program
- Tie-up with credit facilities that grant soft loan or multiplier farms.
- Conduct appropriate/ applicable technology that will enhance productivity.
- Market matching.
- Review the guidelines on the establishment of Auctions Centers for LGUs strategic operational realignment of purpose (pro-farmer).
- Provide Tax holidays to new investors of livestock and poultry for at least 3 years.
- Link with partner agencies.

**c. Fisheries**

- Prepare Proposal for funding
- Development of marketing post per LGU organize LGU's trading post and buying station
- Assist existing associations in product development & packaging, training
- Prepare Proposal for funding
- Link with other government financing institutions and private groups.

**4.9.2 Wood**

- Provide premiums/tax incentives to forest industries investing in new machineries/tools/equipment and in Research & Development ( R&D)
- Skills development for producing quality timber for upland people's organizations and private investors.
- Sustain and increase government investment on tree plantation initiatives thru the National Greening Program ( NGP)
- Establishment of measures for steady supply of quality planting materials
- Institutionalize forest investment security instruments.
- Institutionalize chain-of-custody mechanism & forest certification.
- Provision of technical & financial assistance for wood products value adding
- Effective forest protection drive thru grassroots participation and collaboration of NGA's, NGO's, LGU's in the implementation of E.O 23
- Establishment of satellite monitoring station and strengthening of forest Patrol and surveillance work
- Creation of composite team to closely monitor the identified entrance of illegal forest products from neighboring provinces.
- Extend technical/financial assistance to NGP-funded areas for intensive management of crops
- Provision of funds for training & capacitating IPO's/PO's
- Lobby for the passage of sustainable Forest Mgt. Law
- Policy issuance for forest investment securitization & chain-of-custody

**4.9.3 Industry/Trading and Services**

- Investment Promotion and Facilitation Intensification
- MSME Development Initiatives

- Networking with Stakeholders
- Business Permits and Licensing Streamlining
- Policy Review/Formulation
- Enhancement of entrepreneurial capacity and product development capacity of MSMEs
- Provision of Shared Service Facilities
- Technology Upgrading
- IEC on mandatory requirements relative to food industry sector
- Intensify Credit Facilitation
- Business Development Initiatives
- Competitiveness Initiatives Intensification
- Intensification of market and trade development initiatives
- Institutionalization of Industry Cluster Development
- Research and Development Intensification
- Trade Promotion Support
- Strengthening of industry networks
- Strengthening of Disaster Risk Reduction and Management Awareness of Businesses

#### **4.9.4 Tourism**

- Through the Regional Development Council XI, actively push for the implementation of the Davao Tourism Access Program (DTAP), which shall focus on connectivity in air, sea and land.
- Implement a sustainable tourism destination infrastructure program
- Develop diversified tourism products that engage local communities
- Implement a PPP-based mandatory tourism enterprise accreditation system and facilitate tourism investment and lower cost of business
- Safeguard natural and cultural heritage and vulnerable groups
- Adopt a PPP-based marketing strategy and action plan.
- Develop tour packages for specific market functions to include bilingual brochures and promo materials.
- Participate in international missions for targeted markets.
- Institutionalize tourism in LGUs
- Develop a competent, well-motivated and productive tourism workforce
- Improve governance in the area of safety, security and in dealing with tourists.

#### **4.10 Programs and Projects Activities ( PPA's)**

##### **4.10.1 Agriculture**

###### **a. Agri-Aquaculture Enhancement Program**

- High Value Commercial Crop Development Project
- Cereals Enhancement Project
- Fishery Enhancement Project
- Cooperative Enhancement Project



**b. Livestock Development Program**

- Rabies Control and Prevention Project
- Dairy Development Healthcare Project
- Animal Products Regulation and Utilization Project
- Animal Breeding and Upgrading Project
- Animal Healthcare and Disease Management Project
- Animal Disease Surveillance and Diagnosis Project
- Livestock and Dairy Production and Restocking Project

**c. Fisheries**

- Establishment of Davnor Agri Fishery Eco-Tourism Park

**4.10.2 Environment**

**a. Integrated Watershed Development Program**

- Cave Management Project
- Riverbank Rehabilitation Project
- Upland Reforestation Project
- Mangrove Rehabilitation Project
- Urban Greening Project

**b. Natural Resources Management and Protection Program**

- Ecological Solid Waste Management Project
- Mineral Resources Management Project
- Sanitary Landfill Project

**4.10.3 Industry/Trading and Services**

**a. Trade and Investment promotion Development Program**

**b. Micro, Small and Medium Enterprise (MSME) Development Project**

**4.10.4 Tourism**

**a. Tourism Development Program**

- Tourism Marketing and Promotion Project
- Sites Development Project
  - *Improve, rehabilitate and upgrade:*
    - *Strategic connecting roads*
    - *water, power and solid waste management facilities*
  - *Design and construct:*
    - *Tourism information centers and support infrastructure*

- *Transport terminals and services*
- Human Resource Development Project
  - *Organize local communities and link them to the tourism value chain in their local areas*
  - *Institutionalize Tourism in LGUs*
  - *Skills capability building*
- Tourism Policy Formulation Project
  - *Formulate LGU Tourism Master Plans and Tourism Codes*
  - *Establish a Tourism Database*

## 5.0 TRANSPORTATION AND ACCESS

### 5.1 EXTERNAL LINKAGES

#### 5.1.1 Land Access

The external linkages of the province are mainly land-based. The major external linkages consist of national roads connecting Davao del Norte to adjacent provinces of Compostela Valley, Bukidnon, Agusan del Sur, Davao Oriental and to the City of Davao. These roads are the Agusan-Davao Road, Surigao-Davao Coastal Road, Kapalong-Talaingod-Valencia, Bukidnon Road and Asuncion-Laak-Veruela, Agusan del Sur Road. Physical condition of these road sections is presented in the Table below.



*Table No. 3-86: Major External Linkages  
 Province of Davao del Norte, 2013*

Road Name	Length(km)	%paved	RROW(m)	No. of Concreted Lanes
Agusan-Davao Road	37.986	100	60	4-6 lanes
Surigao-Davao Coastal Road	6.848	100	20-30	2-4 lanes
Kapalong-Talaingod-Valencia, Bukidnon Road	55.985	47.52	20	2 lanes
Asuncion-Laak-Veruela,Agusan del Sur Road	19.345	47.52	20	2 lanes

Source: DPWH

#### *a. Major External Access Routes*

The **Agusan-Davao Road** extends from Compostela Valley in the north to Davao City in the south, while the **Surigao-Davao Coastal Road** connects the provinces of Davao Oriental and southern parts of Compostela Valley to the province of Davao del Norte. While Davao City serves as the main center for economic and social activities in Region XI, these routes serve as the main trunkline for the flow of trade and the delivery of basic social services across Davao del Norte, as well as, the northern provinces in the region. Davao del Norte, especially Tagum City plays an important role as a converging point of these two road sections. This puts the province as potential trading hub for Agusan del Sur, Compostela Valley and Davao Oriental. The Agusan-Davao road also connects to the poblacion of Carmen and Panabo City. National secondary roads and provincial roads connect the rest of the municipalities in the mainland

The **Kapalong-Talaingod-Valencia, Bukidnon Road** is already established but not yet fully operational though a four wheel drive and motorcycle can already pass through it.

This road connects Davao del Norte to the province of Bukidnon via Talaingod and Kapalong in Davao del Norte, and San Fernando and Valencia City in Bukidnon. This road pave the way for more opportunities in the development of various sectors in the province such as, the trade and industry; eco-tourism, agriculture, livestock and agro-forestry; as well as the deployment of basic social services and security enforcements in its tributary areas. It is also the shortest route from Davao del Norte to Bukidnon and vice versa.

Despite the high serviceability of this road, it has been observed to be constantly enduring severe road slips and landslides brought by heavy rains and past typhoons making the road difficult to traverse.

The **Asuncion-Laak-Veruela, Agusan del Sur Road** was converted into a National Secondary Road by virtue of RA 10075 dated April 20, 2010. This road connects Davao del Norte to the province of Compostela Valley and Agusan del Sur. The route will pass through Asuncion and San Isidro in Davao del Norte, Laak in Compostela Valley and Veruela in Agusan del Sur. The opening of this road provides an alternate and shorter route for the exchange of development opportunities among the three provinces.

#### *b. Other Access Routes*

There are also other provincial and city roads that link the province to Compostela Valley and Davao City, however, these roads are gravel and earthroads. These are the following:

**Igangon-Sawata (Davao del Norte)-Bdry. Binasbas (ComVal) provincial road**– This 10.12 kilometer gravel paved road also connects the municipality of San Isidro, Davao del Norte to Laak, Compostela Valley.

**Saug-Sonlon-Bdry. Longanapan provincial road** –This 11.60 kilometers gravel road is the shortest route from Laak, Compostela Valley going to Tagum City via New Corella, Davao del Norte.

**Sonlon-New Visayas-Camansa provincial road** – The road is in mountainous terrain connecting the eastern barangays of Asuncion to Compostela Valley via Montevista. The road length is 7.07 kilometers of gravel paved and earthroad.

**Limbaan-Sta. Fe-El Salvador provincial road** – Connects the municipality of New Corella to Bdry.Sitio Bayabas, Nabunturan, Compostela Valley. The road is 18.82 kilometers of gravel road and some portions traverse in mountainous area.

**Carcor-Patrocenio (Davao del Norte)-Jct Bayabas (ComVal) provincial road** - This road also connects the municipalities of New Corella, Davao del Norte to Nabunturan, Compostela Valley. The road is 14.68 kilometers of gravel road and mountainous area.

**Feeder Road 2, Sto. Tomas-Magwawa provincial road** – This road has 9.19 kilometers of gravel-paved and 1.02 kilometer of concrete road. It connects from Poblacion Sto. Tomas to the mountainous areas of Paquibato District which is part of Davao City.

**Katualan (Davao del Norte)-Callawa (Davao City)road**– This 2.9-kilometer Panabo City road connects to Buhangin, Davao City.

**Malativas (Davao del Norte) – Binowang (Davao City) Road-** A 3-kilometer city road that connects Panabo City to Paquibato District, Davao City.

**Kiotoy-Sta. Cruz- Bunawan (Panabo City – Davao City)** – This fifteen-kilometer gravel road connects Panabo City to Mahayag, Bunawan, Davao City.

**Kaputian-Babak, Samal-Sasa, Davao City Routes** – This route is a 24 km road that traverses from Kaputian District to Babak District of Samal Island plus the Roll on Roll off system that ply the Pakiputan strait which is the Babak-Sasa Sea Route.

### c. Bridges

Table No. 3-87: **List of Existing Bridges along National Roads by Type, by City and Municipality Province of Davao del Norte, 2013**

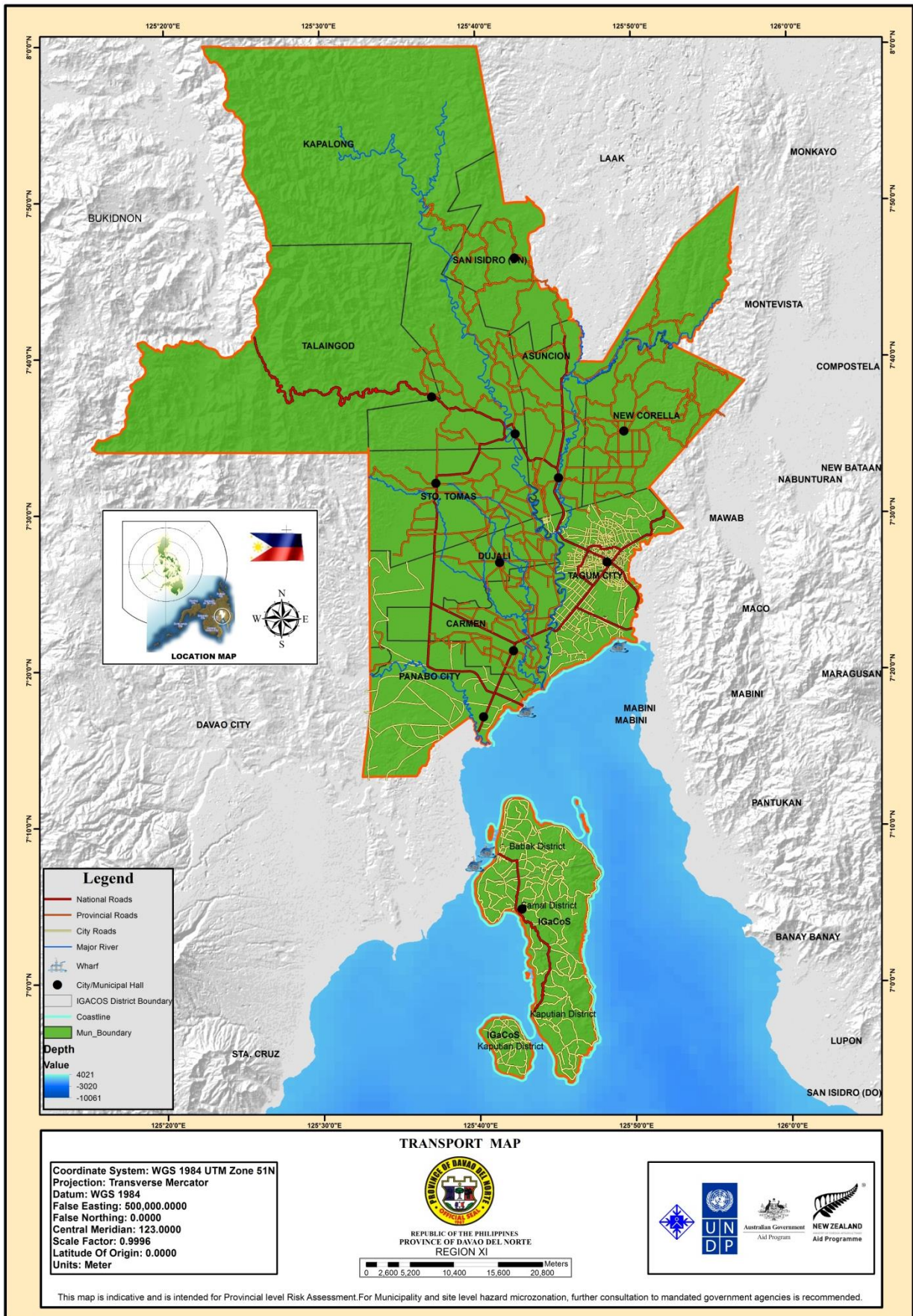
<b>Municipality</b>	<b>Name of Bridge</b>	<b>Construction Type</b>	<b>Length (Ln.M.)</b>
Tagum City	1. Libuganon Bridge	RCDG	36.60
	2. Gov. Miranda Bridge 1	STEEL	149.30
	3. Gov. Miranda Bridge 2	RCDG	648.00
	4. Pagsabangan Bridge	RCDG	60.50
Sub-total			<b>894.40</b>
Asuncion	1. Ilog Bridge	RCDG	24.00
	2. Magatos Bridge	RCDG	31.50
	3. Cambaogo Bridge	RCDG	10.00
	4. Bunawan Bridge	RCDG	36.00
Sub-total			<b>96.50</b>
Kapalong	1. Maniki Bridge	RCDG	178.80
	2. Kipaliko Bridge	RCDG	39.35
	3. Gabuyan Bridge	RCDG	15.90
Sub-total			<b>234.05</b>
Talaingod	2. Sto. Niño Bridge 2	RCDG	40.60
	3. Nanaga Bridge 1	STEEL	46.15
	4. Nanaga Bridge 2	STEEL	25.85
	5. Mesolong Bridge	STEEL	67.55
	6. Napisulan Bridge	STEEL	46.00
	7. Lasang Bridge	RCDG	30.10
	Sub-total		
Carmen	1. Tuganay Bridge	STEEL	54.60
	2. Ising Bridge	RCDG	24.90



	3. Mangalcal Bridge	FLAT SLAB	23.60
	4. Basak Bridge	RCDG	12.60
	5. New Camiling Bridge	RCDG	12.60
	6. Alejal Bridge	RCDG	12.60
	7. Magsaysay Bridge 2	RCDG	12.50
	8. Magsaysay Bridge 1	RCDG	10.60
Sub-total			<b>164.00</b>
Panabo City	1. Lasang Bridge	RCDG	55.50
	2. Tanglaw Bridge 4	RCDG	20.68
	3. Tanglaw Bridge 3	RCDG	20.70
	4. Tanglaw Bridge 2	RCDG	20.20
	5. Tanglaw Bridge 1	RCDG	30.60
	6. Locutan Bridge 2	RCDG	11.30
	7. Locutan Bridge 1	RCDG	20.50
	8. Tadeco Bridge	RCDG	12.40
Sub-total			<b>192.88</b>
Sto. Tomas	1. Feeder road 5 Bridge	RCDG	25.50
	2. Menzi Bridge	RCDG	40.90
Sub-total			<b>66.40</b>
IGaCoS	1. Peñaplata Bridge	RCDG	10.50
	2. Benoling Bridge	RCDG	24.00
Sub-total			<b>34.50</b>
<b>TOTAL</b>			<b>1,969.68</b>

Source: DPWH-PEO

Map 32: Transport Map, Davao del Norte



*d. External Linkage Characteristics*

**Table No. 3-88: Traffic Volume on Major Arterial Roads (Comparative/Projected/Actual, 2012) Davao Region**

Road Name	Section	*Growth Ratio 1996-2016	Actual 1996 (AADT)	Projected 2007 (AADT)	Projected 2016 (AADT)	Actual 2012 (AADT)
<b>Davao del Norte</b>						
Agusan-Davao Road (Daang Maharlika)	Tagum-Mawab, ComVal	3.70	3,278	11,175	12,000	34,332
	Panabo City-Davao City	3.60	8,345	24,868	30,000	38,510
Surigao-Davao Coastal Road	Tagum Section			10,680		23,198
<b>Other Provinces</b>						
Davao-Bukidnon Road	Davao City	2.50	1,211	2,876	3,000	10,435
Davao-Cotabato	Sta. Cruz, DS	6.40	3,596	16,254	23,000	12,528
	Digos, DS	3.50	6,836	19,995	24,000	18,640
	Bansalan	5.40	1,830	7,265	10,000	7,730
Surigao-Davao Coastal Road	Lupon, DO	3.50	1,423	4,162	5,000	5,656
Daang Maharlika	Monkayo, ComVal	5.50	1,460	5,877	8,000	4,064

Source: DPWH XI, DIDP Master Plan

*\*The growth ratio is based on the 1998 Davao Integrated Development Program Master Planning which in turn is sourced on DPWH Region XI and Master Plan Study on Visayas and Mindanao Islands Strategic Road Network Development Project undertaken by DPWH-JICA, 1997*

Table No. 3-62 shows the traffic volumes on major trunk line roads of the province and of the equivalent roads in the other provinces. The 2016 Average Annual Daily Traffic (AADT) is based on the values derived from the study made by Department of Public Works and Highway (DPWH) and Japan International Cooperation Agency (JICA) which was based on a future socioeconomic framework, present origin/destination matrices and forecast models formulated by existing transportation patterns, hence derived the 1996-2016 growth ratios. For purposes of data consistency in terms of comparison to other provinces, the same growth ratio is used to project for 2007 figures. Data gathered for 2012 were taken from the National Road Traffic Survey Program (NRTSP)- Southern Mindanao Region undertaken by the DPWH XI Regional Office.

Davao City is the main junction point of all the major arterial roads located in the region. It is also the center for business and trade, security administration, tourism and other social activities in the region.

The table shows that Agusan - Davao Road, which is a portion of the Daang Maharlika particularly in the Panabo City-Davao City section, has the highest volume of traffic as compared to other arterial roads in the region. It has a total traffic count of 38,510 as year 2012. This section is the bottleneck of the traffic going to Davao City from the different areas in Davao del Norte, Compostela Valley, Davao Oriental and Agusan, Bukidnon and vice versa. The Tagum-Mawab section of the same road network and the Tagum section of the Surigao-Davao Coastal road also have relatively higher traffic volume compared to other road sections in the region.

**Table No. 3-89: Distribution of Unpaved National Roads by Province/City  
Davao Region 2013**

<b>Province/City</b>	<b>Unpaved National Roads (Gravel and Earth Roads in kilometers)</b>	<b>Percent Distribution %</b>
Davao del Norte	41.79	8.23%
Compostela Valley	127.02	25.00%
Davao Oriental	82.56	16.25%
Davao del Sur	230.15	45.30%
Davao City	26.49	5.22%

Source: DPWH XI

National roads play a vital role in providing inter-provincial linkage in the region. Major arterial roads facilitates the flow of economic and social activities between the major city which is Davao, and the provinces; the 2012 distribution of unpaved national roads, Davao del Norte has relatively low percentage of unpaved national road compared to other provinces. Most of these remaining unpaved length accounts to the proposed Kapalong-Talaingod-Valencia, Bukidnon Road and the Asuncion-Laak-Veruela, Agusan del Sur Road.(Table No. 3-61).

*d. Key Transport Infrastructure and Facilities*

*d.1. Bridges*

There are six bridges along the Agusan-Davao road, nine bridges along Kapalong-Talaingod- Valencia, Bukidnon Road and two bridges along Asuncion-Laak-Veruela, Agusan del Sur road within Davao del Norte section (Table No. 3-64). These are all classified as national bridges maintained by the Department of Public Works and Highways. These bridges are in excellent conditions which could serve two to four-lane traffic.



*Table No. 3-90. Bridges Along Major External Linkages Province of Davao del Norte, 2013*

Name of Bridge	Construction Type	No. of Lanes Capacity	Length (Ln.M.)
Libuganon Bridge	RCDG	4 lanes – 2 way	36.60
Gov. Miranda Bridge 1	Steel	2 lanes – 1 way	149.30
Gov. Miranda bridge 2	RCDG	2 lanes – 1 way	648.00
Tuganay Bridge	Steel	4 lanes – 2 way	54.60
Ising Bridge	RCDG	4 lanes – 2 way	24.90
Lasang Bridge	RCDG	4 lanes – 2 way	55.50
Kipaliko Bridge	RCDG	2 lanes - 2 way	39.35
Gabuyan Bridge	RCDG	2 lanes - 2 way	15.90
Sto. Niño Bridge 1	RCDG	2 lanes - 2 way	30.70
Sto. Niño Bridge 2	RCDG	2 lanes - 2 way	40.60
Nanaga Bridge 1	Steel	2 lanes - 2 way	46.15
Nanaga Bridge 2	Steel	2 lanes - 2 way	25.85
Mesolong Bridge	Steel	2 lanes - 2 way	67.55
Napisulan Bridge	Steel	2 lanes - 2 way	46.00
Lasang Bridge	RCDG	2 lanes - 2 way	30.10
Cambaogo Bridge	RCDG	2 lanes - 2 way	10.00
Bunawan Bridge	RCDG	2 lanes - 2 way	36.00

Source: DPWH-DEO

In spite of the existing infrastructure facilities, the province still needs additional mode of transportation in the delivery of goods and comfort of the commuters.

#### **d. 2. Inter-Provincial Public Transport Facilities**

Along the Agusan-Davao and the Surigao-Davao trunkline, there are three land transport terminals that serve as collecting points for inter-provincial passenger traffic across Davao del Norte. These are the public terminals in Tagum City, Carmen and Panabo City. With Davao City as the key destination, inter-provincial public utility buses also avails these terminals as main stop over points in the province. Routes plying to Compostela Valley, Davao Oriental, Surigao del Sur, Agusan del Sur and Misamis Oriental, as well as, inter-island buses to Manila pass by these terminals.

The Tagum City public terminal has 24 bays capacity for inter-provincial buses. The terminal is adjacent to the public market with amenities like commercial spaces and restrooms that serve the needs of the traveling passengers.

The Panabo City public terminal has 10 bays capacity for both north bound and south bound buses. Commercial spaces and passengers' lounge that caters the needs of the passengers are also located at the terminal.



The newly completed public terminal in Carmen has two bays for south and north bound buses. Like the Panabo public terminal, it is located adjacent to the national highway at the poblacion center.

The public terminal in Sto. Tomas also provides inter-provincial routes to Davao City via Carmen and Panabo City.

**5.1.2 Sea Access**

The private ports in Panabo City and Tagum City are the only existing ports that provide external linkages for exportation in the province. These ports are engaged in exporting agricultural products mainly bananas. In terms of sea transportation, the province is linked to other parts of the country mainly through, the passenger ferry services in the Port of Davao, and in the ports of Cagayan de Oro City and Nasipit, Agusan del Norte which is about 300 kilometers and 200 kilometers, respectively, from the province. The Port of Davao is connected by passenger ferry services with cities of Manila, Iloilo, Cebu, Zamboanga, and General Santos while the ports in Cagayan de Oro and Nasipit caters passenger ferry services to and from the cities in Visayas and Manila.

*Table No. 3-91: Ports Engaged in Product Exportation  
Province of Davao del Norte, 2013*

<b>Classification</b>	<b>Port Name</b>	<b>Location</b>	<b>Ownership</b>	<b>Major Cargoes</b>
Private	HPI Wharf	Madaum, Tagum City	Hijo Plantations Inc.	Mainly bananas; others- ipil-ipil and palm oil
Private	TADECO Wharf	San Pedro, Panabo City	Tagum Agricultural Development Corp.	Mainly bananas; others- fertilizers, etc.
Private	STANFILCO Wharf	Bayawa, Panabo City	STANFILCO	Mainly bananas; others- fertilizers, etc.

*Source: CDP, LGU*

In the 1996 study of the Davao Integrated Development Program, STANFILCO and TADECO wharves handled 372,706 and 363,960 tons of cargoes, respectively, which was 50% of the total volume of cargoes handled for export by private ports in Region XI. During that period, the private ports in Region XI share about 95% of the total volume of products that are for export in the region.

An expansion of the private port facility in Hijo Plantation, Brangay Madaum, Tagum City is soon to be operational. This new development of Hijo International Port Services is a joint business venture between HijoResources Corporation and (HRC) and International Container Terminal Services Inc. (ICTSI). With a 54-hectare terminal area, a 1200-meter draft berth and an annual capacity of two million (TEU) 20-foot equivalent units of container is foreseen, this development of Madaum Port can relieve the congestion in Davao City Ports.

### **5.1.3 Air Access**

The province avails of the nearest and practical air transport facility via Francisco Bangoy International Airport (FBIA) in Davao City. The FBIA is the busiest and most modern airport in Mindanao and accommodates large planes from major airlines such as Philippine Airlines, Cebu Pacific, Silk air and Tiger Airways. These major carriers ply the Davao route from major domestic and select international destinations.

The province, with its key cities, shall scout potential areas based on their CLUPs/CDPs for an alternative airport site. This is in anticipation that FBIA can no longer cater the increasing number of passengers and bigger bodied airplanes in the future. The current airport site, with a total area of 217 hectares, has exceeded its capacity of two million passengers as reflected in the 2011 and 2013 data of the Civil Aviation Authority of the Philippines (CAAP)-Davao.

### **5.1.4 Proposed Improvements of Roads and Transport Facilities that connect to other cities and province to wit:**

#### **a. Construction of Samal Bridge**

The construction of a bridge connecting the Island Garden City of Samal (IgaCos) to Davao City is identified as one of the region's essential infrastructure facilities for development.

The bridge is expected to bring various opportunities for land development and redevelopment on both sides. This would further improve the livelihood and social conditions of the people of IgaCos. The Davao Gulf Area Development Plan considered IgaCos as a hub for its proposed integrated Port Complex. This physical infrastructure connection will facilitate many of these developments and other activities.

Among the planned developments are to increase tourism potential of IGAcos and be among the most favorable international tourist destination. Other conceived development activities include beach and marine resort development, eco-tourism, commuter's weekend recreation and environment-friendly commercial and industrial development.

#### **b. Davao del Norte – Agusan Road via Kapalong - Loreto**

The completion and additional improvement of Patel-Kapatagan road with 2-lane Bridge Component will provide more development for the small and medium scale enterprises in the province as a marketplace for the agricultural and agro-forestry products from Agusan Del Sur.

#### **c. Sonlon- New Visayas –Camansa ,Davao del Norte)- Montevista Compostela, Valley Road**

This road section will help improve the small and medium enterprises in transporting products from vast production areas in Montevista to Davao del Norte's marketplace. Palm oil and rubber industries will also benefit from this project. At present minimal resource allocation is provided to the said facility.

d. Sonlon-Longanapan-Laak Road

The road leads to areas in eastern part of Asuncion and part of Compostela Valley province suitable for agriculture and wood production. Marketing point of the products from these areas is in Tagum City. Improvement of this road will invite landowners to maximize the use of their lands and improve productions.

e. Katualan, Panabo City - Callawa, Davao City

This road is the shortest route from Panabo City leading to Buhangin District of Davao City. Improvement of this road shall help decongest the volume of traffic in the main national highway.

f. Construction of Diversion Roads (Imp'v't. of Kiotoy, Sta. Cruz – Bunawan)  
(Panabo –Davao)

This is a 15km gravel road that connects Panabo City and Davao City. This road section has a newly constructed RCDG Bridge funded by the MRDP. Motorists may use this route but improvements are still needed for this road to be fully serviceable.

g. Mindanao Railway Project (MRP)

This project shall promote a multi-modal transport across Mindanao and enhance interconnectivity and linkages through the passenger and freight railway transport development. It is expected to further boost tourism, trade and commerce. The MRP will link major cities including Cagayan de Oro, Iligan, Zamboanga City, Butuan, Surigao, Davao and General Santos City. It is hoped that its railroads will traverse the Province of Davao del Norte particularly in Tagum City where it is proposed as one of the major connecting points. A full blown feasibility study will be one of the top priorities of the National Economic development Authority (NEDA).

h. High Standard Highway (HSH)

A High Standard Highway (HSH) will address the existing issues on traffic congestion that delays delivery of goods, services and people. It refers to roads providing smooth traffic flow with full access control including expressways as well as primary arterial and by-passes. These expressways aim to decongest urban road sections of inter city roads as well as achieve internationally accepted road safety standards.

In 2009, Japan International Cooperation Agency (JICA) in coordination with the Department of Public Works and Highways conducted a study that focused on the

Development Strategies for High Standard Highway for the Tagum – Davao – General Santos Corridor in Mindanao. A full blown Master Plan for this expressway must be pursued.

### **5.1.5. Gender Responsive Road Network**

Based on the assessment conducted with the use of Department Order (DO) No. 48, Series of 2011: Guidelines for Mainstreaming the Gender Equality Actions in Road Infrastructure Projects Toolkit No. 9, particularly the Field Inspection Guide, hereunder are the results of the over – all quantitative rating for each road network:

<b>Road Name</b>	<b>Raw Score</b>
Agusan – Davao Road (Daang Maharlika)	22.99
Surigao – Davao Coastal Road	18.059
Tagum City Diversion Road	18.96
Carmen – Dapecol Compound Road	18.725
Babak – Samal – Kaputian Road	19.30

Source: DPWH

Based on the tabulated results, among the five road networks Agusan - Davao Road (Daang Maharlika) that passes through, Tagum City, Carmen and Panabo City got a raw score of 22.99, which means that the road infrastructure and related facilities are gender – responsive.

Agusan – Davao Road (Daang Maharlika), Tagum City, Davao del Norte already demonstrated gender responsiveness, with the presence of most key features, such as waiting sheds, street lights, center islands with pedestrian refuge beautifully landscape with flowering plants, access road for motorcycles, bicycle lanes, sidewalks, informative and warning signs and road shoulder planted with palm trees.

On the other hand, the remaining four road networks having a values/raw score within the range of 15 – 21.9 show that these areas are already gender sensitive which respond to differing needs of women, however, need GAD technical advice in some areas.

All road networks make basic services such as employment, school, market, health/medical facilities, public transport and information facilities accessible. Presence of highway facilities such as sidewalk, pedestrian refuge and crossings, waiting sheds, lanes for non – motorized vehicles or intermediate modes of transport, center islands, safety and security facilities such as guardrails, chevron, barriers, street lights and other related facilities have made the road gender responsive, but still, these roads need further improvement to make the road network more gender responsive.

With reference to the result of the assessment conducted, the following are the

additional facilities needed to make the roads more gender responsive:

1. Standard and sufficient traffic safety devices such as pavement markings and warning/informatory (directional) signs for motorists.
2. Safe areas for walking/sidewalk including loading and unloading bays
3. Security facilities (e.g. more lighting facilities and surveillance cameras)
4. Drainage facilities for flood prevention

## 5.2 INTERNAL CIRCULATION

The internal circulation of the province is characterized by land and sea transportation. Except for the Island Garden City of Samal, all other municipalities and cities are interconnected to each other by national, provincial and city roads. The IgaCos is connected to the mainland by passenger and Roll on Roll off (RORO) ferry services via Davao City.

### 5.2.1 Road Systems

#### a. Road Networks

The total road network in the province is 3,852.238kilometers, which is categorized into five (5) types according to its administrative functions, namely: national roads, provincial roads, city roads, municipal roads, and barangay roads. Table No. 3-67 shows the total road network per administrative functions.

*Table No. 3-93. Total Road Network by City/Municipality and by Administrative Functions Province of Davao del Norte, 2013*

Municipality/City	National Road	Provincial Road	City Road	Municipal Road	Barangay Road	Total Length
<i>Tagum City</i>	48.137		143.547		398.346	590.030
<i>Panabo City</i>	33.122		154.809		281.524	469.455
<i>IGaCoS</i>	24.921		242.500		166.240	433.661
<i>Asuncion</i>	26.390	115.88		13.940	224.420	380.63
<i>New Corella</i>	-	187.08		54.400	174.50	415.98
<i>Kapalong</i>	19.926	93.31		12.33	216.456	342.022
<i>San Isidro</i>	4.127	73.02		88.73	93.601	259.478
<i>Talaingod</i>	47.382	52.45		95.87	7.66	203.362
<i>Sto. Tomas</i>	13.391	138.68		15.21	208.50	375.781
<i>Carmen</i>	20.973	125.53		32.512	106.986	286.001
<i>B.E. Dujali</i>	-	55.49		12.84	27.508	95.838



<b>Davao del Norte</b>	<b>238.37</b>	<b>841.44</b>	<b>540.856</b>	<b>325.832</b>	<b>1,905.74</b>	<b>3,852.238</b>
<b>%Distribution</b>	<b>6.19%</b>	<b>21.84%</b>	<b>14.04%</b>	<b>8.46%</b>	<b>49.47%</b>	<b>100.00%</b>

Source: PEO, DPWH, LGU's

Total length of barangay road accounts for the highest percentage of road length in the province with 49.47 percent followed by provincial roads with 21.84 percent. National and municipal roads have the lowest percentage of 6.19 and 8.46 percent, respectively while city roads comprise 14.04 percent of the total road network.

In terms of road right-of-way national roads ranges from 20 to 60 meters, while provincial and city roads ranges from 15 to 20 meters. Municipal roads have road right-of-way that ranges from 10 to 20 meters, while barangay roads have minimum of eight (8) meters and maximum of 12 meters.

Among the three cities, Tagum City, the capital of the province, has the largest total road network of 590.03 kilometers which is also the largest for the whole province, but it has the least length of city roads among the component cities. It has the most national road of 48.137 kilometers, since it is located in the intersection of three major national roads in the province namely; the Agusan-Davao Road, Surigao-Davao Coastal Road and the Tagum-PanaboCircumferential Road. Tagum City also has the most barangay roads in the province.

Panabo City is second to Tagum City in terms of total road network among the three cities. It has a total of 469.455 kilometers of total road network. This is because the provincial roads and the municipal roads were turned over as city road that will be maintained by the city government. On the other hand, the Island Garden City of Samal has the least total of road networks of the three cities which is 433.66 kilometers.

Among the municipalities, New Corella has the highest total road network and provincial roadlength of 415.98 kilometers and 187.08 kilometers, respectively. Sto. Tomas is second highest both in the total road networklength andin provincial road length of 375.781 and 138.68 kilometers, respectively. On the other hand Kapalong is ranked third in the total road network of 342.022 kilometers among municipalities.

B.E. Dujali has the least total road network of 95.838 kilometers. Talaingod has the most national roads among the municipalities with a length of 47.382 kilometers. This is because larger portion of the Kapalong-Talaingod-Valencia, Bukidnon road is within Talaingod. However, Talaingod has the least provincial and barangay road length of 52.45 and 7.66 kilometers respectively.

**Table No.3-94: Distribution of All-Weather Barangay Roads by Province/City**

**Davao Region, 2013**

Province / City	All-Weather Barangay Roads ( km )	% Distribution
Davao del Norte	1,905.74	20.68
Compostela Valley	1,775.86	19.27
Davao Oriental	1,385.77	15.04
Davao del Sur	2,868.34	31.14
Davao City	1,278.09	13.87

Source: Provinces/City

Barangay roads are important for the internal circulation in the province. They link barangays to provincial, municipal or city roads. They are also referred to as feeder roads, rural roads or farm to market roads.

In the 2003 data Davao del Norte has the most barangay roads in terms of length compared to other areas in the region. At present, there is a reduction of length of barangay roads in Davao del Norte due to the conversion of some barangay roads to municipal or city roads.

**b. Main Internal Circulation Routes**

1. Tagum- Panabo Circumferential Road

The Tagum-PanaboCircumferential Road is a national secondary road connecting Agusan-Davao Road. It connects the poblacion areas of Sto. Tomas, Kapalong and Asuncion to the centers of Tagum and Panabo cities. Its influence area includes the municipalities of Sto. Tomas, Kapalong, Asuncion, and also Talaingod, San Isidro and B.E. Dujali. There are several roads tributary to this circumferential road that connects to the municipalities of Talaingod, San Isidro and to the center of B.E. Dujali. Other provincial and city roads also connect to the inner barangays and banana plantation areas in Sto. Tomas, Carmen, Kapalong, Asuncion and Panabo City. This road is vital for the export banana production which is the main economic feature in its influence area and the main route for transport of bananas for export to Panabo City wharves.

2. Carmen-Davao Penal Colony (DAPECOL) Road

The Carmen-DAPECOL Compound road is a bypass road of Tagum-Panabo road. It connects areas of Sto. Tomas to the municipality of Carmen. It is the main transport route for agricultural products, such as, bananas coming from areas between Sto. Tomas and Carmen. This is also a main route of goods and commodities, and passenger traffic between Panabo City, Carmen and Sto. Tomas.

3. Bdry. Baca, Tagum City - New Corella – Sonlon – Camansa ,Asuncion Provincial Road

The Tagum-New Corella road is the main and the shortest route that links Tagum City and the urban center of New Corella. Its influence area includes the rural production areas of New Corella and the eastern barangays of Asuncion or Kaimunan sa Manguwangan ug Dibabawon(KAMADI) District. It is the main route for the transport of goods, commodities, agricultural products, such as, rice, corn, bananas, coconut, cacao, mango, durian and basic social services.

#### 4. Asuncion-San Isidro Roads

There are two routes between the municipalities of Asuncion to San Isidro. These are two provincial road sections namely: Km9 Sagayen - Sawata Road and Igangon - Sawata Road sections that serve as link between Compostela Valley and Davao del Norte. These roads are tributaries to Asuncion-San Isidro-Laak-Veruela National Road. These road networks traverse Banana and cacao production areas.

#### 5. San Isidro-Kapalong Road

One of the roads tributary to Tagum-Panabo circumferential road is the road from San Isidro to Kapalong consisting of Km. 9 Sagayen-Sawata provincial road, Pandulian - Jct San Miguel provincial road and Kapalong - Mabantao - Florida provincial road. Its influence area is characterized by the expansion of banana and cacao production and forestlands in the hinterlands of San Isidro and Kapalong.

#### 6. Tagum City-Sto. Tomas Road

The road section is composed of Boundary Tagum - Crossing Kinamayan-Sto. Tomas road. This is the shortest route between Tagum City and the municipality of Sto. Tomas. This road traverses through the rice and banana production areas in Sto. Tomas. Several connecting roads also link to other barangays of Sto. Tomas, Dujali, and to some urban barangays and banana plantation areas in Kapalong.

#### 7. Tuganay-Dujali Roads

The Tuganay-Dujali road is composed of Tuganay-Anibongan-San Isidro and San Isidro-Dujali-San Miguel road sections. It connects B.E. Dujali to the Agusan-Davao Road at Tuganay, Carmen. Other provincial roads also connect B.E. Dujali to Sto. Tomas and Tagum City. These roads are important for the growing banana production and fishery production in B.E. Dujali.

#### 8. Babak-Samal-Kaputian Circumferential Road

The Babak-Samal-Kaputian Circumferential Road is located within the Island Garden City of Samal connecting the three districts of the city. This road is the main trunkline for the circulation of basic goods and commodities, basic social services, trade and security services within the island. It plays a major role for tourism in the island. It provides

access through land transport to the different areas of tourism destination. The road is also vital for the transport of perennial crop products, such as, mango and coconut.

Several city roads and barangay roads serve as tributary to the circumferential road. These roads lead to the inner barangays, as well as to the inland and coastal areas of the island with tourism significance.

#### 9. Talikud Island Circumferential Road, IGaCoS

This 17.18km road stretch is basically gravel-paved that connects the four barangays of the island namely Linusotan, Sta. Cruz, Cogon and Dadatan. This road also brings access to existing resorts and some potential diving areas. Talikud, at present, needs to improve its road infrastructure in order to generate more tourism development and private investments. Upgrading of this circumferential road will enable tourists and the people in the community to move conveniently within the island.

#### 10. Tagum City By Pass Road

(Jct. Agusan – Davao Rd.– Canocotan– San Miguel – Mankilam –Pagsabangan – La Filipina – Magdum, Tagum City, Davao del Norte)

It is an existing 20.35km barangay road which traverses from Jct. Agusan – Davao Rd.– Canocotan – San Miguel – Mankilam –Pagsabangan – La Filipina – Magdum, Tagum City, Davao del Norte.

#### 11. Panabo City By Pass Road

(Jct. Agusan – Davao Rd. J.P. Laurel Sec. - Jct. Tagum – Panabo Circum. Rd. Southern Davao Section)

This is an existing 8.92km provincial road which traverses from junction Agusan – Davao Road J.P. Laurel Section – Gredu – New Visayas – Jct. Tagum – Panabo Circumferential Road Southern Davao Section, Panabo City, Davao del Norte to Jct. Brgy. Sto. Niño (Daang Maharlika Road).

### **c. Roads Leading to Tourist Destination Areas**

The tourism industry is one of the drivers of the economic growth in Davao del Norte. Tourist destinations are abounding the province inviting more and more visitors and enthusiasts from all over. The 2013 data records a total of 671,759 tourist arrival. Accessibility to these spots needs to be established while improving the existing ones.

**Table No. 3-95. Projects under DOT-DPWH Convergence Program, 2013**

District	No. of Projects Enrolled	No. of Projects Approved	No. of Projects for Funding
Dist. I	4	1	3
Dist. II	4	3	1
Total	8	4	4

Beginning 2013, eight (8) road sections leading to prime tourist destinations are enrolled in the Department of Tourism (DOT)-Department of Public Works and Highways (DPWH) Convergence Program. From the table above, only four (4) road sections are approved while another four (4) projects are to be implemented on the next funding.

**d. Travel Time**

**Table No.3-96. Average Travel Time from the Province to Davao City, Under Major External Routes, 2013**

City/Municipality	Travel Time
Talaingod	2hrs-15mins
Kapalong	1hr-45mins
Asuncion	1hr-15mins
San Isidro	2hrs-15mins
New Corella	1hr-30mins
Sto. Tomas	1hr-30 mins
Be Dujali	1 hr-20 mins
Carmen	1 hr
IGaCoS	40 mins
Panabo City	50 mins
Tagum City	1hr- 30 mins

Source: PEO- Davao del Norte

The average travel time from the different cities and municipalities in the province to Davao City, the regional center is shown in Table No. 3-69. Talaingod and San Isidro are the farthest municipalities with respect to Davao City. Travel time from Tagum City is on average while the Island Garden City of Samal and the city of Panabo has the least time of travel.



Table No. 3-97. Average Travel Time from Major Provincial Urban Centers to Production Agricultural Areas, Province of Davao del Norte, 2013

Major Urban Centers	Production Areas								
	Talaingod	Kapalong	Asuncion	San Isidro	New Corella	Sto. Tomas	BE Dujali	Carmen	IGaCoS
Tagum City	1hr-20mins	45mins	30mins	1hr-20mins	30mins	45mins	25mins	25mins	1hr-30mins
Panabo City	1hr-45mins	1hr-20mins	1hr-10mins	2hrs	1hr-10mins	1hr	40mins	12mins	1 hr

Source: PEO-Davao Del Norte

The table reflects the average time of travel from the production areas in different municipalities to the two major urban centers of the province; Tagum and Panabo City. Tagum and Panabo City are categorized under small/medium city (Primary Urban Center A). Most of the agricultural and production areas are located in the municipalities. Carmen and BE Dujali are nearer in terms of time travel to Panabo City, while the rest of the municipalities take longer time to travel to Tagum City.

d. Access to Social Services

Table No 3-98. Average Travel Time to Municipalities/Cities where Government and Major Hospitals are Located, Province of Davao del Norte, 2013

Hospital Locations	Municipalities/Districts							
	Talaingod	Asuncion	San Isidro	New Corella	Sto. Tomas	Be Dujali	Babak District (IGaCoS)	Kaputian District (IGaCoS)
Tagum City	1hr-20mins	30mins	1hr-20mins	30mins	45mins	20mins	1 hr - 50 mins	2 hrs - 20 mins
Panabo City	1hr-45mins	1hr-10mins	2hrs	1hr-10mins	1 hr	40mins	1 hr	1 hr - 30 min
Kapalong	45mins	20mins	45mins	1hr-15mins	50mins	50mins	2 hrs - 30 mins	2 hrs - 50 mins
Carmen	1hr-30mins	1hr	1hr-45mins	1hr	50 mins	30mins	1 hr -20 mins	1 hr - 50 mins
Samal District (IGaCoS)	3 hrs-10 mins	2 hrs-20 mins	3 hrs-10 mins	2 hrs-40 mins	2 hrs-20 mins	2 hrs - 10 mins	10mins	30mins

Source: PEO-Province of Davao del Norte

Major private and government hospitals are located in Tagum City, Panabo City, Kapalong, Carmen and Island garden City of Samal. Talaingod, Asuncion, San Isidro and Sto. Tomas take lesser time to travel to Kapalong but larger hospitals are located in Tagum City. New Corella, Asuncion and B.E. Dujali take the least time to travel to Tagum City. Talaingod and San Isidro have the longest travel time to any of the hospital facilities

in the province. In the Island Garden City of Samal, Kaputian District takes more time to travel to a hospital in Samal District as compared to Babak District which, on the other hand, also is nearer to Davao City than the other two districts.

Generally, schools and health centers are located in the center of a barangay or a municipality. In remote barangays, centers are usually located near the larger clusters of settlements. In some cases, smaller clusters in sitios travel to the barangay center as far as five (5) kilometers or more.

## 5.2.2 Road Characteristics

### a. Road Types

Table No. 3-99. Inventories of National Roads, Province of Davao del Norte, 2013

Name of Road/Location	Concrete(km)	Asphalt(km)	Gravel(km)	Total (km)
<b>Agusan-Davao Road</b>				
Tagum City	9.129	11.936		21.065
Carmen	2.683	6.626		9.309
Panabo City	4.277	2.491		6.768
<b>Surigao-Davao Coastal Road</b>				
Tagum City	6.848			6.848
<b>Tagum City Diversion Road</b>				
Tagum City	10.279			10.279
<b>Tagum-Panabo Circumferential Road</b>				
Tagum City	8.337	1.608		9.945
Asuncion	11.172			11.172
Kapalong	11.323			11.323
Sto. Tomas	7.926	5.465		13.391
Panabo City	18.920	4.645		23.565
<b>Carmen-DAPECOL Compound Road</b>				
Panabo City	2.639			2.639
Carmen	8.255	1.311		9.566
<b>Babak-Samal-Kaputian Road</b>				
IGaCoS	24.921			24.921
<b>Kapalong-Talaingod-Bukidnon Road</b>				
Kapalong	8.603			8.603
Talaingod	19.033		28.349	47.382
<b>Asuncion -San Isidro - Laak - Veruela Road</b>				
Asuncion	5.540	9.678		15.218
San Isidro		4.127		4.127
<b>Agusan - Davao Road Channelization</b>				
Carmen	1.810			1.810

<b>Davao - Agusan Road - Dapecol Compound Road Channelization</b> Carmen	0.288			0.288
<b>Tagum - Panabo Circumferential Road - Dapecol Compound Road Channelization</b> Panabo	0.150			0.150
<b>TOTAL</b>	<b>161.061</b>	<b>35.154</b>	<b>42.154</b>	<b>238.369</b>

Source: DPWH-Engineering District, Province of Davao del Norte

Table No. 3-100. Provincial Roads, by Type of Pavement By City and Municipality Davao del Norte, 2013

Road Name	Length in Kilometers				
	Gravel	Asphalt	Concrete	Earth	Total
Asuncion	115.38	0	0.50	0	115.88
Kapalong	87.72	0	5.59	0	93.31
New Corella	170.70	0	16.38	0	187.08
San Isidro	72.05	0	0.97	0	73.02
Talaingod	42.45	0	0	10.00	52.45
Carmen	122.86	0	0.28	2.39	125.53
Sto. Tomas	136.36	0	2.32	0	138.68
BE Dujali	53.98	0	0	1.51	55.49
Grand Total	801.50	0	26.05	13.90	841.44

Source: PEO, Davao del Norte

The table presents the length of roads by type of pavement within Davao Del Norte. Gravel roads have the highest length at 801.50km while the least belongs to the earth road at 13.90km at Talaingod, Carmen and BE Dujali.

Table No. 3-101. Road Conditions of Provincial Roads, 2013

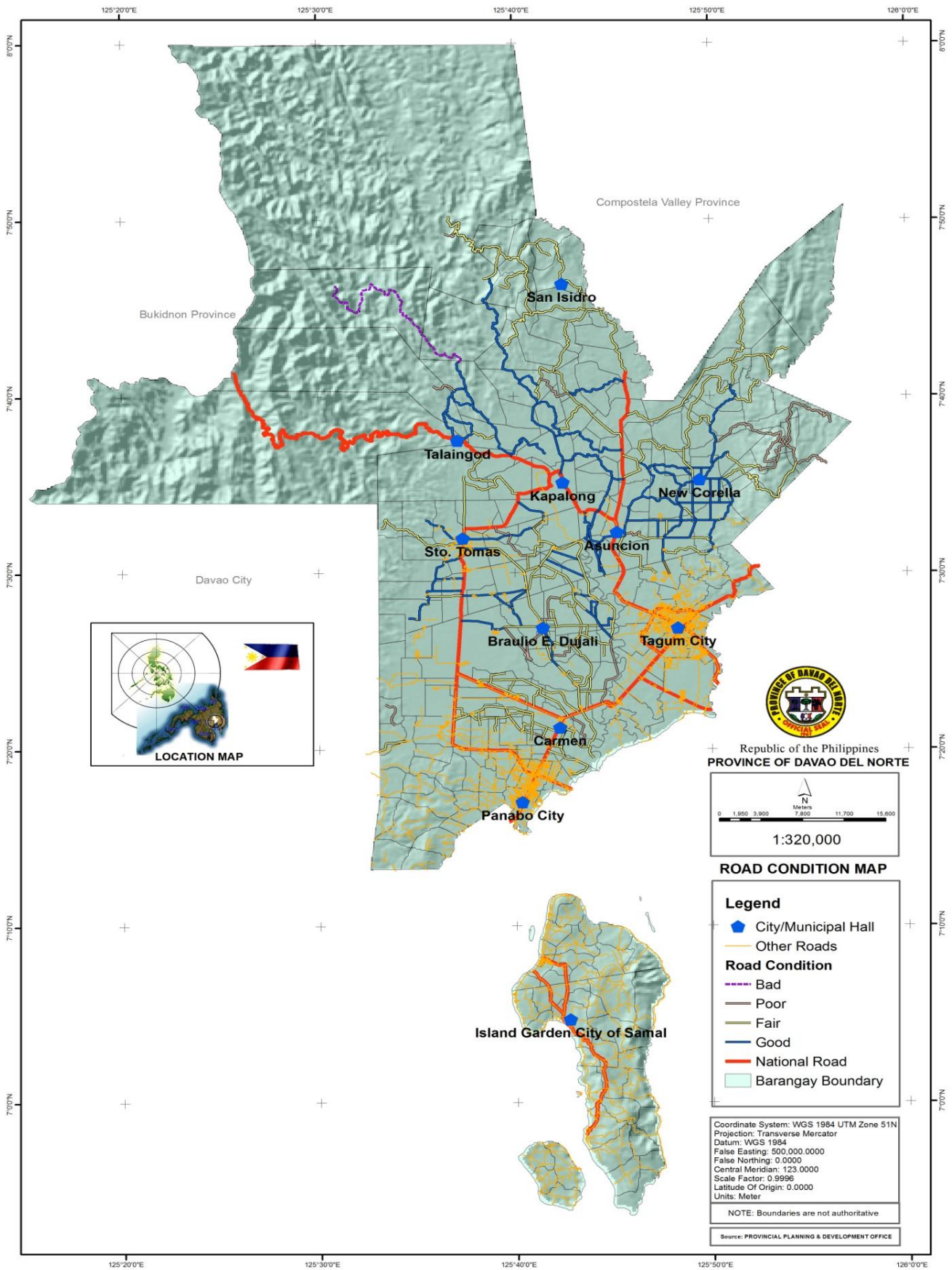
District	Municipality	Surface Road Condition Length(km)				Length(km)
		Good	Fair	Poor	Bad	
District 1	Asuncion	54.59	66.71	2.00	-	123.30
	Kapalong	48.52	36.90	4.39	-	89.82
	New Corella	79.86	54.89	47.18	-	181.93
	San isidro	5.03	69.36	-	-	74.39
	Talaingod	25.10	0.63	2.82	23.90	52.45
District 2	Carmen	-	119.76	17.47	-	137.23
	B.E. Dujali	6.73	32.34	15.34	-	54.41
	Sto. Tomas	62.87	59.73	5.31	-	127.91
	<b>Total</b>	<b>282.71</b>	<b>440.32</b>	<b>94.51</b>	<b>23.90</b>	<b>841.44</b>
	<b>% Distribution</b>	<b>33.60</b>	<b>52.33</b>	<b>11.23</b>	<b>2.84</b>	<b>100.00</b>

Source: PPDO-GIS Division

Based on the criteria specified on the Special Local Road Funds (SLRF) – Local Roads Inventory Form 2 of the Department of Interior and Local Government (DILG) “Fair” means the road is smooth riding even if there are visible potholes and cracks. On the other hand, “Poor” means uneven riding, large percentage patching or potholes, cracking and edge damage while “Bad” means very rough riding, extensive damage and potholes, badly broken edges and poor drainage.

Data generated from the GIS Division of the Provincial Planning and Development Office indicates that out of the 841.44 kms of provincial roads, 282.71 kms or 33.6% are in good condition, 440.32 kms or 52.33% are fair, 94.51 kms or 11.23% are in poor while 23.90 kms or 2.84% are in bad condition. Improvement and rehabilitation of road sections with poor and bad surface conditions shall be given priority to enhance accessibility and mobility through provision of sufficient funds.

**Map 33. Road Condition Map, Davao del Norte**



**Table No. 3-102 Type of Road Pavement by Administrative Function**



Province of Davao del Norte, 2013

Administrative Level	Concrete	Asphalt	Gravel	Earth	Total Length (km)
National Road	161.061	35.154	42.154		238.369
Provincial Road	26.05		801.50	13.90	841.44
Municipal Road	21.059	1.450	117.123	186.20	325.832
City Road	101.48	38.48	400.82	0.07	540.85
Barangay Road	53.4058	43.171	1,356.750	452.413	1,905.74
<b>Total</b>	<b>363.055</b>	<b>118.255</b>	<b>2,718.348</b>	<b>652.58</b>	<b>3,852.238</b>
<b>%Distribution</b>	<b>9.42%</b>	<b>3.07%</b>	<b>70.57%</b>	<b>16.94%</b>	<b>100.00%</b>

Source: DPWH, PEO LGUs

The road network by type of pavement is being presented in Table No. 3-75. Concrete and asphalt represent the well-paved existing road in the province. Only 9.42 percent of the total roads in the province are paved with concrete while 3.07 percent of the total roads are paved with asphalt. National roads have the highest percentage of paved roads. Most of other roads are gravel-paved with a 70.57 percent of the total road network. The condition of barangay roads are either paved, gravel or earth roads. Most of the paved barangay roads are located in urban areas.

Most of the asphalt road in the province is located in Tagum City where a citygovernment-operated asphalt mixing facility is utilized as an economic enterprise. This scheme opens up possible opportunities for other municipalities in finding alternative means for improving the road conditions, because asphalt construction is cheaper than a concrete pavement.

Table No. 3-103. **Distribution of Unpaved Provincial Roads by Province  
Davao Region, 2013**

Province	Unpaved Length (km)	% Distribution
Davao del Norte	815.39	38.32 %
Compostela Valley	535.62	25.17 %
Davao Oriental	459.28	21.58 %
Davao del Sur	317.81	14.93 %

Source: PEO of respective provinces

Shown above are the lengths of unpaved provincial roads of the four provinces in the region. Davao del Norte has the most unpaved length of provincial roads compared to other provinces in the region.

**b. Road Density**

**Table 3-104. ROAD DENSITY by City/Municipality in Km/Km<sup>2</sup>  
Davao Del Norte, 2013**

Municipality/City	Total Road Network(Km)	Total Road Requirement (Based on National Standard 1 Km / Sq. Km)	Road Density (km/Km <sup>2</sup> )	Road Gap (Km)
Tagum City	590.030	192.000	3.07	
Panabo City	469.455	259.720	1.81	
Igacos	433.661	301.300	1.43	
Asuncion	380.630	301.560	1.26	
New Corella	415.980	321.480	1.29	
Kapalong	342.022	941.850	0.36	599.82
San Isidro	259.478	179.800	1.44	
Talaingod	203.362	454.960	0.44	251.59
Sto. Tomas	375.781	320.410	1.17	
Carmen	286.001	275.16	1.03	
B.E. Dujali	95.838	91.000	1.05	
Davao Del Norte	<b>3,852.238</b>	<b>3,639.24</b>	<b>1.05</b>	-

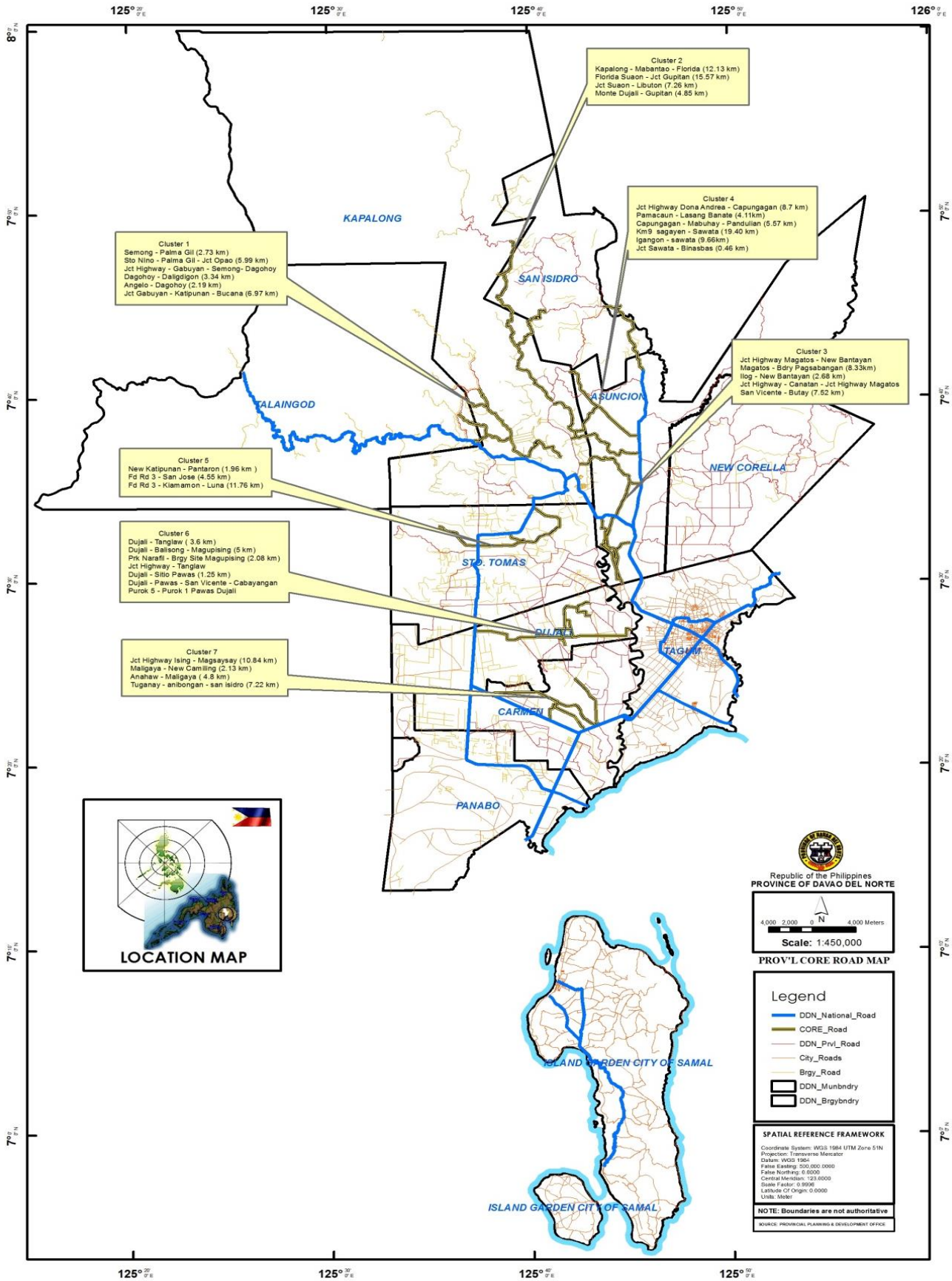
The Road Density is determined based on the total road requirement using the national standard of 1.0 Kilometer of road length per Square Kilometer of the total land area. After establishing the total road requirement, it turns out that, the province has no road requirement or has enough roads with a density of 1.05 km per sq. kilometer. This is 0.073 km./sq.km.higher than the 2007 road density data of 0.977km./sq. km. However, uneven distribution of roads at the LGU level results to additional road requirements among the municipalities, particularly that of Kapalong and Talaingod. Vast area of forestland within these municipalities also contributes to the corresponding road gaps.

The Davao Regional Development Plan 2014-2016 indicated that the region’s total road network of 16,937.43 kilometers is composed of national and local roads wherein local roads (provincial, city, municipal and barangay) make up the bulk of 92 percent of the total length. In spite of this, the 2010 inventory of roads in the region shows that the over- all computed road density in Davao Region was 0.86 km./sq.km. Relatively, the province of Davao del Norte shall focus to increase road network in the above mentioned Local Government Units (LGUs) with road requirements.

**5.2.3 Provincial Core Road Clustering**

Identification of core roads reduces the length of local roads to be given priorities with. Important roads that contribute most to the transport network shall be dealt with first in terms of budget allocation and implementation.

**Map 34. Provincial Core Road Map, Davao del Norte**



A core road is the minimum road network required to support the economic and social development of the province by providing good quality road linkages between the population centers, ecotourism, industrial and economically valuable locations in the province. The prioritization includes connectivity, economic, social services and environmental criteria.

Table 3-105. Clustered Provincial Core Road Networks, Davao del Norte 2013

<b>Cluster/LGU</b>	<b>Name of Road Section</b>	<b>Road Length(km)</b>
1/ Talaingod	Semong-Palma Gil	2.73
	Sto. Nino-Palma Gil-Jct. Opao	5.99
	Jct Highway Gabuyan-Semong-Dagohoy	5.89
	Dagohoy-Daligdigon	3.34
	Angelo-Dagohoy	2.19
	Jct Gabuyan-Katipunan-Bucana	6.97
	Sub-Total	<b>27.11</b>
2/Kapalong-San Isidro	Kapalong-Mabantao-Florida	12.13
	Florida-Suaon-Jct Gupitan	15.57
	Jct Suaon-Libuton	7.26
	Monte Dujali-Gupitan	4.58
	Sub-total	<b>39.54</b>
3/ Asuncion	Jct Highway Magatos-New Bantayan	7.10
	Magatos-Boundary-Pagsabangan	8.33
	Ilog-New Bantayan	2.68
	Jct highway-Canatan-Jct Highway Magatos	4.85
	San Vicente-Butay	7.52
	Sub-total	<b>30.48</b>
4/Asuncion-San Isidro	Jct Highway Dona Andrea-Capungagan	8.70
	Pamacaun-Lasang-Banate	4.11
	Capungagan-Mabuhay-Pandulian	5.57
	Km 9 Sagayen-Sawata	19.40
	Igangon-Sawata	9.66
	Jct Sawata-Bdry Binasbas	0.46
	Sub-total	<b>47.90</b>
5/ Sto-Tomas-kapalong	New katipunan-Pantaron	1.96
	Feeder Road 3-San Jose	4.55
	Feeder Road 3-Kimamon-Luna	11.76
	Sub-Total	<b>18.27</b>
6/B.E. Dujali-Sto. Tomas	Dujali-Tanglaw	3.60
	Dujali-Balisong-Magupising	5.52
	Prk Narafil-Brgy Site Magupising	2.08
	Jct Highway-Tanglaw	3.98
	Dujali-Sitio Pawas	1.25
	Purok 1-Purok 2-Sitio Pawas	1.40
	Dujali-Pawas-San Vicente	4.42
	Jct Salvacion-San Vicente-Cabay-angan	3.45
	Purok5-Purok 1 Pawas-Dujali	2.18
	Sub-total	<b>27.88</b>
7/Carmen	Jct Highway Ising-Magsaysay	10.84
	Maligaya-New Camiling	2.13
	Anahaw-Maligaya	4.80
	Tuganay-Anibongan-San Isidro	7.22

	Sub-total	<b>24.99</b>
	TOTAL	<b>216.17</b>

*Source: Provincial Road Network Development Plan 2014-2018*

Considering the limited resources available for rehabilitation of the provincial roads, a participatory process of identification and prioritization of core roads has been employed. Table 3-78 presents the clusters of provincial core roads as a result using the above mentioned prioritization criteria.

Table 3-106. Ranking of Provincial Core Road Clusters, 2013

RANK	CORE ROAD CLUSTER/LGU
<b>1</b>	Cluster 2/ Kapalong-San Isidro
<b>2</b>	Cluster 5/Sto. Tomas-Kapalong
<b>3</b>	Cluster 6/B.E. Dujali-Sto. Tomas
<b>4</b>	Cluster 4/Asunsion-San Isidro
<b>5</b>	Cluster 7/Carmen
<b>6</b>	Cluster 3/Asuncion
<b>7</b>	Cluster 1/Talaingod

*Source: Provincial Road Network Development Plan 2014-2018*

An evaluation process and criteria in prioritizing the core road clusters using the Goals Achievement Matrix (GAM) and Ranking by Perceived Urgency was set out during the formulation of the Provincial Road Network Development Plan of the province. Identification of priority projects for all cluster components will be based on this ranking.

**d. Provincial Road Investments**

There are two (2) sources of funds for road construction, maintenance and rehabilitation, namely the General Fund and 20% Development Fund. Provincial Road Network Development Plan (PRNDP) data show that, out from the internal source, maintenance works in year 2013 has an allocated sum of 55.2million pesos while road rehabilitation has 21.53million pesos taken from provincial calamity fund. Despite the aid coming in from various national programs like MRDP and DIDP, funds are still not enough to compensate all the needed improvements for the road networks.

The meager budget for the road investment retards the process of reaching the sought after good road condition of all roads that is ideal for better access and delivery of services. Such gap needs to be addressed accordingly.



### 5.2.4 Traffic Volume

Table No. 3-107. **Traffic Volume on Some Major Internal Circulation Routes  
Davao del Norte, 2012**

Road Section	Motorcycle	Car	Jeepney	Bus	Truck	Total
Tagum-Carmen	11,049	810	195	6	1,267	<b>13,327</b>
Tagum-Asuncion	5,969	679	307	36	566	<b>7,557</b>
Sto. Tomas-Carmen-Panabo City	6,277	1,650	272	45	2,336	<b>10,580</b>

Source: PEO

The average annual daily traffic volume on some internal circulation routes in the province is presented on Table 3-80. It was observed that the largest traffic volume is at Tagum-Carmen- section, considering that this section is along the Daang Maharlika formerly the Agusan-Davao Road trunkline. It is also significant to note the volume of truck traffic along the Sto. Tomas-Carmen -Panabo section. This road section serves as collector road for the vast banana production areas in Panabo, Sto. Tomas, Kapitalong and Asuncion. This road plays a vital role for the transport of Cavendish banana for export from the production areas to the wharves in Panabo City. Bus traffic is frequent at the Tagum-Carmen section and Sto. Tomas - Carmen - Panabo City. This bus traffic volume is characterized mainly by inter-provincial routes.

### 5.2.5 Road Safety and Administration

Road safety and administration aims to strengthen the safe road design and safety processes to provide road environment which safeguards vehicle speed when transporting goods and individuals. In order to attain the highest possible degree of safety, it is important to validate and monitor road transportation safety with components that include improved road safety management, safer roads, safer vehicles, safer road users, and post crash response.

Presently, there is laxity in the imposition of existing rules and regulations related to road safety and administration in the province. Enforcement of laws and policies on truck overloading, which hastens road deterioration and shortens service life of the road network, is not strictly implemented. Likewise, an effective accident database system which will guide relevant agencies to design countermeasures is also non-existent. With all these observations, there is a need for a strong coordination and management to initiate road safety and administration development processes.

### 5.2.6 Gender Responsive Road Network

The consideration of gender in the transport sector of the internal circulation is essential to ensure that local transport is equitable, affordable and that it provides access to resources and opportunities required for development. Gender-based inequalities will slow economic growth and poverty reduction.

In roadside communities, people normally travel and use the road by foot to perform their daily activities. Because of their multiple roles, women tend to use the roads more often than men. Given the hours spent on the road, women are more vulnerable to road accidents than men. The delivery of health services will also be enhanced with improved road networks. Improved health services will contribute to reducing maternal and infant mortality rates.

Currently, gender aspects are already considered when designing and planning for provincial transport infrastructure and services. GAD seminars and trainings are conducted to all workforces that are involved in the planning and implementation of various infrastructure projects. A few local road projects have initially mainstreamed and implemented GAD and increased economic and social empowerment of women, children and the PWD. Such projects include installation of warning and regulatory signs, and guardrails and pavement markings. Project implementation also imposed separate comfort rooms for male and female. Selection of safe location for batching plant away from the pedestrian or residents is also considered.

With the upcoming rollout of Local Road Management Manual formulated by the Department of Interior and Local Government, gender responsive planning and designing is already incorporated. Gender responsiveness shall then be attributed whenever there is road condition monitoring and inventory.

### 5.2.7 Land Transport Infrastructures, Facilities and Utilities

#### a. Bridges

*Table No.3-108. Summary of Temporary and Permanent Bridges Along Local Roads By City/By Municipality, Davao del Norte 2013*

Municipality	Temporary					
	Bailey		Timber		Total	
	No.	Length (m)	No.	Length (m)	No.	Length(m)
Asuncion	5	111.00	1	10.00	6	121.00
New Corella	4	73.62			4	73.62
Tagum City					0	-
Kapalong	3	90.00			3	90.00
San Isidro	3	39.50			3	39.50

Talaingod	1	60.00			1	60.00
Sto. Tomas	3	30.00			3	30.00
Carmen	3	39			3	39.00
B.E. Dujali					0	-
Panabo City	1	24.00			1	24.00
IGaCoS	4	54.80			4	54.80
Province	27	521.92	1	10	28	531.92
% Distribution	96.43%	98.12%	3.57%	1.88%	100.00%	100.00%

Municipality	Permanent									
	RCDG-2 lane		STEEL		RCBC		RCDG-1 lane		Total	
	No.	Length(m)	No.	Length(m)	No.	Length(m)	No.	Length(m)	No.	Length(m)
Asuncion	14	379.50					6	249.60	20	629.10
New Corella	16	266.30			4	28.00	5	154.00	25	448.30
Tagum City	11	282.78			22	280.00	2	8.22	35	571.00
Kapalong	2	108.00	2	48.00			4	96.00	8	252.00
San Isidro	1	60.00	1	50.00			6	127.00	8	237.00
Talaingod	3	90.00	3	132.38	2	20.00			8	242.38
Sto. Tomas	1	15.00			7	53.00	24	513.50	32	581.50
Carmen	10	740.00	2	202.00	5	40.00	6	120.00	23	1,102.00
B.E. Dujali	4	72.00	4	123.00			4	72.00	12	267.00
Panabo City	3	92.00	1	20.00			8	195.00	12	307.00
IGaCoS	3	47.00	2	86.20	2	9.00	1	30.00	8	172.20
Province	68	2,152.58	15	661.58	42	430.00	66	1,565.32	191	4,809.48
% Distribution	35.60%	44.76%	7.86%	13.76%	21.99%	8.93%	34.55%	32.55%	100.00%	100.00%

Source: PEO, LGU's

The province has been adopting the single lane Reinforced Concrete Deck Girder (RCDG) bridges, which connect provincial roads to barangay roads, and barangay to another. Other bridge design adopted was the two-lane RCDG bridge, which connects one municipality to another. There are also modular steel bridges existing in the province, which were implemented under the foreign assisted President's Bridge Program.

There are 68 units of Two-Lane RCDG Bridges and 66 units of One-Lane RCDG Bridges in the province. Out of the total 5,341.40 linear meters of bridges, 531.92 linear meters are Bailey and Timber bridges which are considered temporary and are located along local roads.

Based on the latest inventory of bridges, there are still road sections traversing river systems in the absence of bridges. Some of these roads are passable only when the river bed is dry, or when water level is low. There are also existing roads that are undeveloped due to the absence of bridges. In areas where bridges are not yet feasible or no roads are present, hanging bridges and cableways are the alternative means of transporting people and goods across the river banks.

*Table No.3-109. List of River Systems Traversed by Roads without Bridges, Province of Davao del Norte, 2013*

City/ Municipality	River System	Name of Road Section where Proposed Bridge will be part of	Proposed Bridge	Length (lm)
Asuncion	Ilog Creek	Cambanogoy-Magatos Road	Cambanogoy/Magatos Br.	30.00
	Saug River	Buclad-New Ibahay Rd	New Ibahay Bridge	80.00
	Macgum River	Napungas-Sonlon Road	Napungas/Sonlon Br.	36.00
	Camansa Creek	Sonlon-Camansa Road	Sonlon/Camansa Br.	24.00
	Saug River	Upper Cabaywa-Cabaywa Proper Rd	Cabaywa Bridge	100.00
	Madgao River	Sagayen-Napungas Rd	Madgao Bridge	38.00
Kapalong	Kapalong River	Langan-Pipisan Rd.	Langan Bridge	100.00
	Gupitan Creek	Monte Dujali-Gupitan Rd.	Gupitan Bridge	12.00
	Kapalong River	Monte Dujali-Kapatagan Rd.	Patel Bridge	50.00
	Libuganon River	Maniki-Mamacao Road	Mamacao Bridge	60.00
Carmen	Buhang Creek	Anibongan-New Maligaya Rd.	Anibongan/New Maligaya	15.00
	Tuganay River	Anibongan-New Maligaya Rd.	Anibongan/New Maligaya	45.00
	Ising River	Lapaz-Lower Tuganay Coastal Rd.	Lapaz/Taba Bridge	90.00
	Ising River	Purok 6 - Purok 1 Ising Road	RCDG	24.00
	Ising River	Purok 8 Ising - Sto Nino	RCDG	30.00
	Ising River	Purok 20 Ising - Mangalcal Rd	Flatslab	12.00
	Buhang Creek	Prk. 4, San Isidro-Dujali Rd.	San Isidro Bridge	24.00
IGaCoS	Bagacay Creek	Tagbitan-ag - Sitio Bagacay Rd.	Tagbitan-ag Bridge	30.00
	Kunghok Creek	Libuak-Balet Road	Libuak/Balet Bridge	20.00
	Madale Creek	Kanaan-Pangubatan Road	Kanaan/Pangubatan Bridge	20.00
	Kanaan Creek	Kanaan-Bandera Road	Kanaan/Bandera Bridge	20.00
	Taglaya Creek	San Antonio-Tagbitan-ag Rd.	Tagbitan-ag Bridge	20.00
	Rabanal Creek	Sitio Tinago Road	Tinago Bridge	30.00
	Bunawan Creek	Sto. Niño-Km. 31	Angelo Bridge	40.00
Talaingod	Bunawan Creek	Sto. Niño-Km. 31	Paiton Bridge	60.00
	Kipaliko River	Tugas-Naseco Road	Naseco Bridge	30.00
	Upper Libuganon River	Angelo-Paiton Road	Angelo/Paiton Bridge	20.00

	Semong River	Paiton-Biasong Road	Paiton/Biasong Bridge	40.00
	Upper Libuganon River	Biasong-Mibulo Road	Bukag Bridge	18.00
	Gabuyan River	Igang-Tambuko Road	Papangi Bridge	15.00
	Gabuyan River	Kuyas-Sto. Niño Road	Kalagutay Bridge	12.00
New Corella	Mandapaan River	Mesaoy-New Bohol(Brgy. Road)	Mandapaan Bridge	18.00
	Mawab Creek	Sta. Fe-Maming Road	Sta. Fe/Maming Bridge	12.00
	Saug River	Cabidanan, New Corella-Buan, Asuncion	Cabidanan/Buan Bridge	80.00
	Saug River	San Roque, New Corella-Napungas, Asuncion	San Roque/ Napungas Bridge	80.00
	NIA Canal	Dasing, Mesaoy-Montecarlo, Del Pilar	Dasing/Montecarlo Bridge	18.00
	Limbaan Creek	P-2, Poblacion	Poblacion Bridge	10.00
		P-5, Poblacion (Along Cemetery)	Poblacion Bridge	18.00
San Roque - Limbaan		San Roque-Limbaan Bridge	24.00	
San Isidro	Madgao River	Pinamuno, San Isidro to Panamurin, Laak, ComVal Road	Pinamuno Bridge	50.00
	Anglas River	Prk Marigold -Prl Palmera (Mamangan )	Mamangan Bridge	36.00
	Igangon Creek	Prk 5, Igangon Road	RCDG Bridge	18.00
	Sabangan River	Prk 6 Sabangan - Bagong Silang	Hanging Bridge	150.00
	Pinamuno Creek	Prk Siabok, Pinamuno Road	RCDG Bridge	24.00
	Mamangan Creek	Prk Sto. Niño Pinamuno Road	RCDG Bridge	24.00
	Kasilak Creek	Agman-Kasilak, Linao Road	RCDG Bridge	30.00
	Sto. Tomas	Tuganay River	Feeder 1-New Visayas Road	Tuganay bridge
Tuganay River		Tulalian - Tibal-og Road	Tulalian Bridge	12.00
BE. Dujali	Matin-ao Creek	Purok 5 Bugtong Talisay Road	Purok 5 Bugtong Talisay Br	24.00
	Mag Creek	Purok 5 New Casay Creek	Purok 5 New Casay Br	24.00
Panabo City	Tulalian River	Homeland Dapco- Natl Highway to Sto Tomas Road	Homeland Dapco Bridge	15.00
	Lasang River	Nanyo-Kaputian Road	Nanyo Bridge	50.00
	Bunawan River	Sta Cruz - Bunawan Road	Sta Cruz RCDG Bridge	24.00
	Upper Licanan River	Upper Licanan-Matignao-Brgy Tagpore Road	Upper Licana Bridge	12.00
	Tulalian River-Packing II	A.O. Floreindo-Nat'l Highway -Carmen	Tulalian Bridge	30.00
	Lower Panaga River	Lower Panaga-Sindaton Road	Lower Panaga Bridge	50.00
	Tagactac River	Mabunao-Sitio Tagactac-San Nicopas	San Nicolas(Tagactac )Bridge	60.00



Total Length				2,468
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Source: LGUs

**b. Land Transport Terminals for Intra Provincial Circulation**

The central bus and jeepney terminal in the province is located in Tagum City. Aside from the inter-provincial public transport, the terminal also caters to intra-provincial routes. The jeepney terminal in Tagum City is located adjacent to the bus terminal. It has a capacity of 10 bays and can accommodate 1,024 jeepneys in 16 hours. At present, the bus and jeepney terminal is being operated by the City Government of Tagum. In other municipalities, bus and jeepney terminals also exist and are being managed by the local government units.

Aside from the government operated terminal, there are also privately operated terminals for jeepneys and small buses in Tagum City. These are the two buildings opposite to the public terminal, and they can accommodate a total of 17 jeepneys simultaneously.

The capital Tagum City is linked through public land transportation to other municipalities by the following key routes:

- Tagum-New Corella
- Tagum-Kapalongvia Asuncion
- Tagum-San Isidrovia Asuncion
- Tagum-Talaingodvia Asuncion and Kapalong
- Tagum-Sto. Tomas
- Tagum-B.E. Dujali
- Tagum-Davao Cityvia Carmen and Panabo City

The jeepney terminal in Panabo City has an 18 bay capacity. The key destinations include: Davao City, Carmen, B.E. Dujali and some hinter barangays of Panabo City such as Dapco and Dalisay.

In the Island Garden City of Samal, bus terminals are located in Babak and Peñaplata with destination to Davao City. Public utility buses, transported by private ferries, travels from Davao City up to Brgy Poblacion Kaputian and vice versa.

**c. Registered Motor Vehicles**

Data on the registered motor vehicles has a decreasing trend from year 2011 to 2012. There is only a slight decrease for private cars and jeeps in 2012. On the other hand, trucks and buses have the highest decrease of 22.23 percent from 2011 to 2012. This decrease was brought about by the high cost of fuel as well as in acquiring vehicles in the area. The recent increase in fares for public utility vehicles and fuel prices also

triggers the riding public to resort to a more economical means of transportation, such as, motorcycles for personal activities, as well as, for livelihood means. The increase of registered trailers also implies an increase in economic activities. Trailers are also frequently used for transporting Cavendish bananas from the production areas to the points of disposal.

*Table No.3-110. Registered Motor Vehicles, Davao del Norte*

Type of Motor Vehicle	Number of Registered Motor Vehicles		% Increase/ Decrease
	Year 2011	Year 2012	
Cars/ Jeeps	9,984	9,316	(6.69%)
Trucks/ Buses	3,300	2,563	(22.33%)
Motor/ Tricycles	49,592	43,385	(12.52%)
Trailers	102	131	28.43%
<b>Total</b>	<b>62,978</b>	<b>55,395</b>	<b>(12.04%)</b>

*Source: LTO, Tagum City, Davao del Norte*

There are no new registrations for government vehicles in 2012. A percentage of 10.42 comprise the public utility vehicles registered, while the private vehicles have the highest number of registration with 87.24 percent of the total registered motor vehicles. This large number is attributed to the number of registered motorcycles.

*Table No.3-111. Statistics on Registered Motor Vehicles  
By Classification and Status: 2013*

Status	Classification of Registered Motor Vehicles			Total
	Private	For Hire	Government	
New	8,071	5		<b>8,076</b>
Renewal	40,254	5,768	1,297	<b>47,319</b>
<b>Total</b>	<b>48,325</b>	<b>5,773</b>	<b>1,297</b>	<b>55,395</b>
<b>% Distribution</b>	<b>87.24%</b>	<b>10.42%</b>	<b>2.34%</b>	<b>100.00%</b>

*Source: LTO, Tagum City, Davao del Norte*

Various types of registered vehicles provide means of transport to public passengers. Basically, large buses ply inter-provincial routes; jeepneys for inter-municipal routes; and tricycles and motorcycles for intra-municipal and city routes. Franchising of tricycles are being processed at the municipal and city level, while the rest are being processed at the Land Transportation Franchising and Regulatory Board.

**5.2.8. EXPOSURE OF ROADS TO HAZARDS**

***a. Exposure of Roads to Flood***

A total of 94.62 km. length of road is exposed to very high susceptible to flooding. This figure reflects 16% out of the total length. This includes 22.47 km. of national roads, 48.67 km. of provincial roads and 23.48 km. of city/municipal roads. The municipality of Asuncion has the longest length of national road exposed to very high susceptibility to flood followed by Carmen. However among the provincial roads, B.E. Dujali has the longest length exposed to the same condition, followed by Asuncion.

There are also roads that are exposed to high susceptible to flooding with 271.70 km. covering 54% of the total length. These roads are composed of 30.40 km. of national roads, 189.20 km. of provincial roads and 52.10 km. of city/municipal roads. The municipality of Asuncion has the longest length of national road exposed to high susceptibility to flooding, followed by Municipality of Carmen. As to the provincial roads, Carmen has the most length followed by B.E. Dujali.

Moreover, there are also roads exposed to moderate susceptibility to flooding with 183.38 km. covering 28% of the total length. These comprise of 35.68 km. of the national roads, 139.46 km. of provincial roads and 8.24 km. of the city/municipal roads. The municipality of Carmen has the longest national road exposed to moderate susceptibility to flood, followed by Kapitalong. On the other hand the longest provincial road exposed to moderate susceptibility to flooding are B.E. Dujali and Sto. Tomas.

Table No. 3-112. Roads Exposed to Flooding, Davao del Norte.

Hazard Code	Road Classification	Road Length (KM)	Road Length Exposed to VHSA/HSA/MSA/LSA for flood (KM)	Percentage of Road length Exposed to Flood
VHSA	City/Mun	742.02	23.48	1.09%
	National	169.84	22.47	0.82%
	Provincial	229.15	48.67	14.00%
	<b>TOTAL</b>	<b>1141.01</b>	<b>94.62</b>	<b>16%</b>
HSA	City/Mun	743.75	52.1	1.84%
	National	171.65	30.4	1%
	Provincial	555.85	189.2	51%
	<b>TOTAL</b>	<b>1471.25</b>	<b>271.7</b>	<b>54%</b>
MSA	City/Mun	741.31	8.24	0.05%
	National	218.24	35.68	2%
	Provincial	551.92	139.46	26%
	<b>TOTAL</b>	<b>1511.47</b>	<b>183.38</b>	<b>28%</b>
LSA	City/Mun	743.712	41.342048	2.54%
	National	116.07	30.04	2%
	Provincial	350.38	99.01	24%
	<b>TOTAL</b>	<b>1210.16</b>	<b>170.39</b>	<b>29%</b>

Source: GIS generated from the Road Network Map of Mines and Geosciences Bureau

Table 3-113. Roads within Very High Susceptible Areas for Flood, By City/Municipality

City/Municipality	Road Classification	Road Length (KM)	Road Length Exposed to VHSA for flood (KM)	Percentage of Road length Exposed to Flood
Asuncion	National	26.01	10.9	0.42%
	Provincial	66.59	17	4.32%
B.E. Dujali	Municipal	0.71	0.71	1.00%
	Provincial	31.29	14.97	4.58%
Carmen	National	24.36	3.14	0.13%
	Provincial	6.53	2.17	0.24%
Kapalong	National	18.61	2.24	0.12%
	Provincial	28.72	1.85	0.24%
New Corella	Provincial	64.2	6.04	2.18%
Panabo City	City	151.78	9.87	0.07%
	National	27.68	1.73	0.06%
	Provincial	0.57	0.57	1%
Sto. Tomas	National	17.6	0.15	0.01%
	Provincial	31.25	6.07	1.44%
Tagum City	City	589.53	12.9	0.02%
	National	55.58	4.31	0.08%
<b>TOTAL</b>	<b>City/Mun</b>	<b>742.02</b>	<b>23.48</b>	<b>1.09%</b>
	<b>National</b>	<b>169.84</b>	<b>22.47</b>	<b>0.82%</b>
	<b>Provincial</b>	<b>229.15</b>	<b>48.67</b>	<b>14.00%</b>
		<b>1141.01</b>	<b>94.62</b>	<b>16%</b>

Source: GIS generated from the Road Network Map of Mines and Geosciences Bureau

Table 3-114. Roads within High Susceptible Areas for Flood

City/Municipality	Road Classification	Road Length (KM)	Road Length Exposed to HSA for flood	Percentage of Road length Exposed to Flood
Asuncion	Municipal	0.04	0.04	1%
	National	26.01	9.52	0.37%
	Provincial	86.27	39.15	8.33%
B.E. Dujali	National	1.81	0.18	0.10%
	Provincial	54.27	30.91	9.92%
Carmen	Municipal	2.4	1.69	0.70%
	National	24.36	4.93	0.20%
	Provincial	98.99	48.4	12.44%
Kapalong	National	18.61	4.89	0.26%

	Provincial	72.74	14.4	2.83%
New Corella	Provincial	142.36	34.53	7.51%
Panabo City	City	151.78	9.87	0.07%
	National	27.68	1.73	0.06%
	Provincial	0.57	0.57	1%
San Isidro	Provincial	16.64	0.61	0.06%
Sto. Tomas	National	17.6	4.82	0.27%
	Provincial	78.77	19.93	6.98%
Tagum City	City	589.53	40.5	0.07%
	National	55.58	4.33	0.08%
	Provincial	5.24	0.7	1.66%
<b>TOTAL</b>	<b>City/Mun</b>	<b>743.75</b>	<b>52.1</b>	<b>1.84%</b>
	<b>National</b>	<b>171.65</b>	<b>30.4</b>	<b>1%</b>
	<b>Provincial</b>	<b>555.85</b>	<b>189.2</b>	<b>51%</b>
		<b>1471.25</b>	<b>271.7</b>	<b>54%</b>

Source: GIS generated from the Road Network Map of Mines and Geosciences Bureau

Table 3-115. Roads within Moderate Susceptible Areas for Flood

City/Municipality	Road Classification	Road Length (KM)	Road Length Exposed to MSA for flood (KM)	Percentage of Road length Exposed to Flood
Asuncion	National	26.01	3.25	0.120%
	Provincial	63.02	7.84	1.53%
B.E. Dujali	National	1.81	0.43	0.24%
	Provincial	52.58	19.3	6.72%
Carmen	National	24.36	12.86	0.53%
	Provincial	103.86	51.28	4.75%
Kapalong	National	18.61	8.22	0.44%
	Provincial	53.58	10.97	1.64%
New Corella	Provincial	137.14	18.81	3.79%
Panabo City	City	151.78	8.16	0.05%
	National	27.68	6.12	0.22%
	Provincial	7.63	2.77	1.41%
San Isidro	Provincial	30.89	0.7	0.19%
Sto. Tomas	National	17.6	4.62	0.26%
	Provincial	103.22	27.79	6.41%
Tagum City	City	589.53	0.08	0.0001%
	National	55.58	0.01	0.0002%
Talaingod	National	46.59	0.17	0.004%
<b>TOTAL</b>	<b>City/Mun</b>	<b>741.31</b>	<b>8.24</b>	<b>0.05%</b>
	<b>National</b>	<b>218.24</b>	<b>35.68</b>	<b>2%</b>



	<b>Provincial</b>	<b>551.92</b>	<b>139.46</b>	<b>26%</b>
		<b>1511.47</b>	<b>183.38</b>	<b>28%</b>

Source: GIS generated from the Road Network Map of Mines and Geosciences Bureau

Table 3-116. Roads within Low Susceptible Areas for Flood

City/Municipality	Road Classification	Road Length (KM)	Road Length Exposed to LSA for flood (KM)	Percentage of Road length Exposed to Flood
Asuncion	National	26.01	0.1	0.004%
	Provincial	11.78	1.77	0.49%
B.E. Dujali	National	1.81	1.21	0.67%
	Provincial	21.16	3.62	1.82%
Carmen	Municipal	2.4	0.67	0.28%
	National	24.36	3.06	0.13%
	Provincial	64.36	24.47	4.75%
Kapalong	National	18.61	1.55	0.08%
	Provincial	52	8.98	2.33%
New Corella	Municipal	0.000048	0.000048	1%
	Provincial	105.81	12.76	3.49%
Panabo City	City	151.78	39.41	0.26%
	National	27.68	17.12	0.62%
	Provincial	9.18	4.16	2.24%
Sto. Tomas	Municipal	0.002	0.002	1.00%
	National	17.6	7	0.40%
	Provincial	83.5	42.9	8.78%
Tagum City	City	589.53	1.26	0.00%
	Provincial	2.59	0.35	0.24%
<b>TOTAL</b>	<b>City/Mun</b>	<b>743.712</b>	<b>41.342048</b>	<b>2.54%</b>
	<b>National</b>	<b>116.07</b>	<b>30.04</b>	<b>2%</b>
	<b>Provincial</b>	<b>350.38</b>	<b>99.01</b>	<b>24%</b>
		<b>1210.16</b>	<b>170.39</b>	<b>29%</b>

Source: GIS generated from the Road Network Map of Mines and Geosciences Bureau

**b. Exposure of Roads to Ground Shaking**

Ground shaking is the general term referring to the qualitative or quantitative aspects of movement of the Earth's surface from earthquakes or explosions. Ground motion is produced by waves that are generated by sudden slip on a fault or sudden pressure at the explosive source and travel through the Earth and along its surface. Ground shaking is the trigger for other hazards such as liquefaction and landslides.

An earthquake simulation at the Central Mindanao Fault with a magnitude of 7.2 reveals that 99.8% of the roads in Tagum City are prone to ground shaking while 97.7% of the same road networks are exposed to liquefaction under the high susceptibility category.

The Municipality of B.E Dujali also has a high percentage of roads prone to ground shaking and exposed to liquefaction with 61.16 % and 74.3%, respectively. (Tables 3-117and 3-118)

Table No. 3-117. Road Network Prone to Ground Shaking

City/ Municipality	Road Length	Roads Prone to Ground Shaking	Percentage of Roads Prone to Ground Shaking
ASUNCION	380.63	92.445	24.29%
B.E. DUJALI	95.838	58.616	61.16%
CARMEN	286.001	63.056	22.05%
IGACOS	433.661	150.167	34.63%
KAPALONG	472.416	100.241	21.22%
NEW CORELLA	465.98	86.971	18.66%
SAN ISIDRO	289.477	51.157	17.67%
STO. TOMAS	375.781	71.662	19.07%
TAGUM	590.03	589.001	99.83%
TALAINGOD	203.362	4.862	2.39%
Davao del Norte	3593.176	1268.177	35.29%

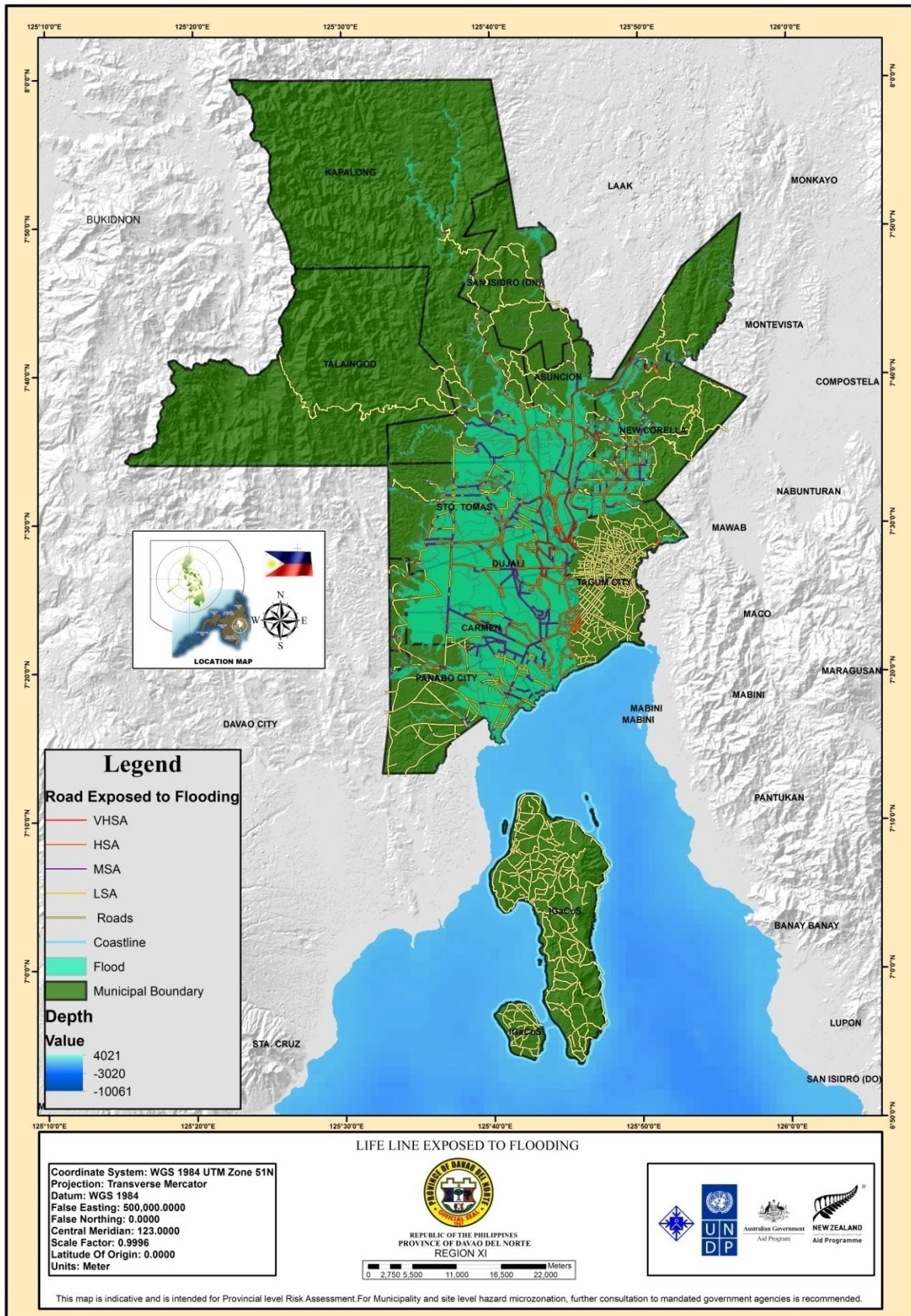
Table No. 3-118. Roads Exposed to Liquefaction

City/ Municipality	Road Length	Road Network Exposed in High Susceptible Areas	Road Network Exposed in Moderate Susceptible Areas	Road Network Exposed in Low Susceptible Areas	Percentage of Road Network exposed in HSA	Percentage of Road Network exposed in MSA	Percentage of Road Network exposed in LSA
ASUNCION	380.63	122.813	12.334	14.888	32.3%	3.2%	3.9%
B.E. DUJALI	95.838	71.194	0.000	0.000	74.3%	0.00%	0.00%
CARMEN	286.001	151.565	0.843	2.919	52.9%	0.3%	1.0%
KAPALONG	472.416	82.089	35.053	12.652	17.4%	7.4%	2.6%
NEW CORELLA	465.980	103.179	18.759	24.074	22.1%	4.0%	5.1%
PANABO	469.555	59.319	49.131	41.965	12.6%	10.5%	8.9%
SAN ISIDRO	289.477	11.993	35.176	17.150	4.1%	12.1%	5.9%
STO. TOMAS	375.781	120.694	1.282	4.177	32.1%	0.3%	1.1%
TAGUM	590.030	576.736	13.294	0.000	97.7%	2.2%	0.00%
TALAINGOD	203.362	0.579	9.206	7.570	0%	4.5%	3.8%
DAVAO DEL NORTE	4,062.631	1,347.161	175.079	125.394	33.2%	4.3%	3.1%

Table No. 3-119. Road Network exposed to rain Induced Landslide

City/Municipality	Road Network Exposed in HAS. (km)	Road Network Exposed in MSA (km)	Road Network Exposed in LSA (km)
ASUNCION	0.67	3.41	32.78
B.E. DUJALI	0.00	0.00	0.00
CARMEN	0.00	0.00	2.93
KAPALONG	4.15	1.79	67.18
NEW CORELLA	23.93	23.18	54.10
PANABO	0.00	0.00	3.29
SAN ISIDRO	0.00	0.00	10.70
STO. TOMAS		3.48	20.39
TAGUM	0.00	0.00	0.27
TALAINGOD	0.00	0.80	8.91

**Map 35. Lifeline Exposed to Flooding**



**c. Exposure of Roads to Earthquake Induced Landslides (EIL)**



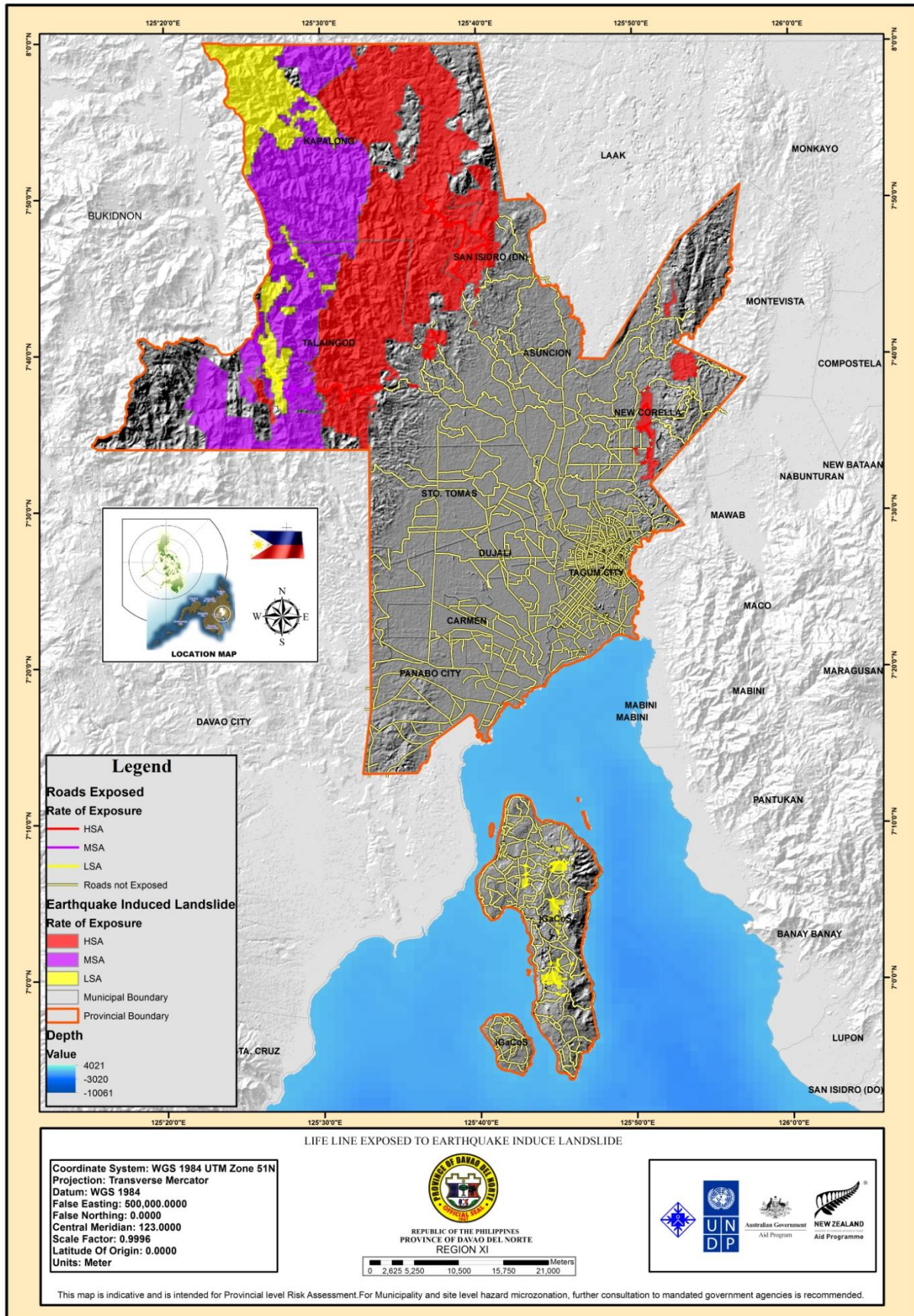
Using the simulation parameters located at Central Mindanao Fault with a magnitude of 7.2 with a depth of 2 km., with epicenter located at 125.75 longitude and 7.53° latitude using the site amplification assumption and wet season, earthquake-induced landslide map is generated. The process reveals that, 23.36 kms., 10.31 kms. and 24.67 of provincial roads are exposed to earthquake-induced landslides under the high susceptible category in the municipalities of Kapalong, New Corella, and San Isidro, respectively. In Talaingod 1.2 kms.of provincial roads and 17.1 kms.of national roads are exposed to this hazard under the same category. Also, 12.60 kms.are exposed to EIL under the moderate susceptible category and 12.60 kms. under the low susceptible category. Island Garden City of Samal has 19.51 kms. of city roads exposed to earthquake-induced landslide under the low susceptible category.

#### Impacts/Implications of Hazard

- Hazards such as floods brought by typhoons or heavy rains due to LPA and landslides due to heavy rains or earthquake induced damage critical infrastructures and lifelines affecting access and mobility and provision of social services.
- The damages to roads and bridges will slow down the delivery of goods and services to areas served by the networks. It stagnates development and may cause artificial shortages of basic goods in the area affected.
- During typhoon Pablo roads were damaged due to scouring caused by floods and run-offs, sections being covered with mud and soil due to embankment slips and landslides; fallen trees, electric posts with cables and wires and other litters spread along the road stretches. Some bridges were also damaged due to scouring of embankmenst and abutments caused by debris carried by strong water currents in swelling river courses, some of which were deposited atop and below the bridges' superstructures.

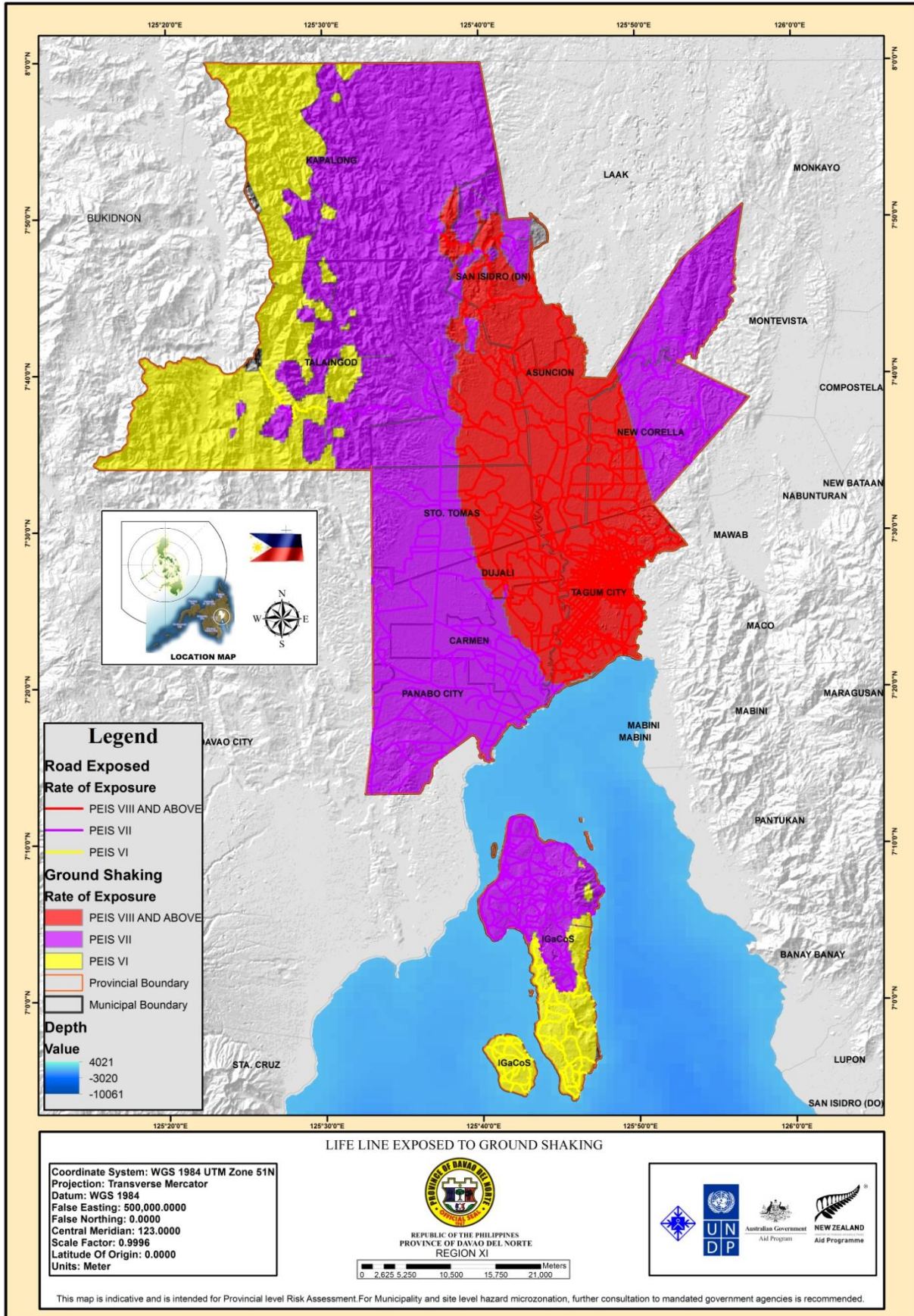


Map 36. Lifeline Exposed to Earthquake-Induced Landslide



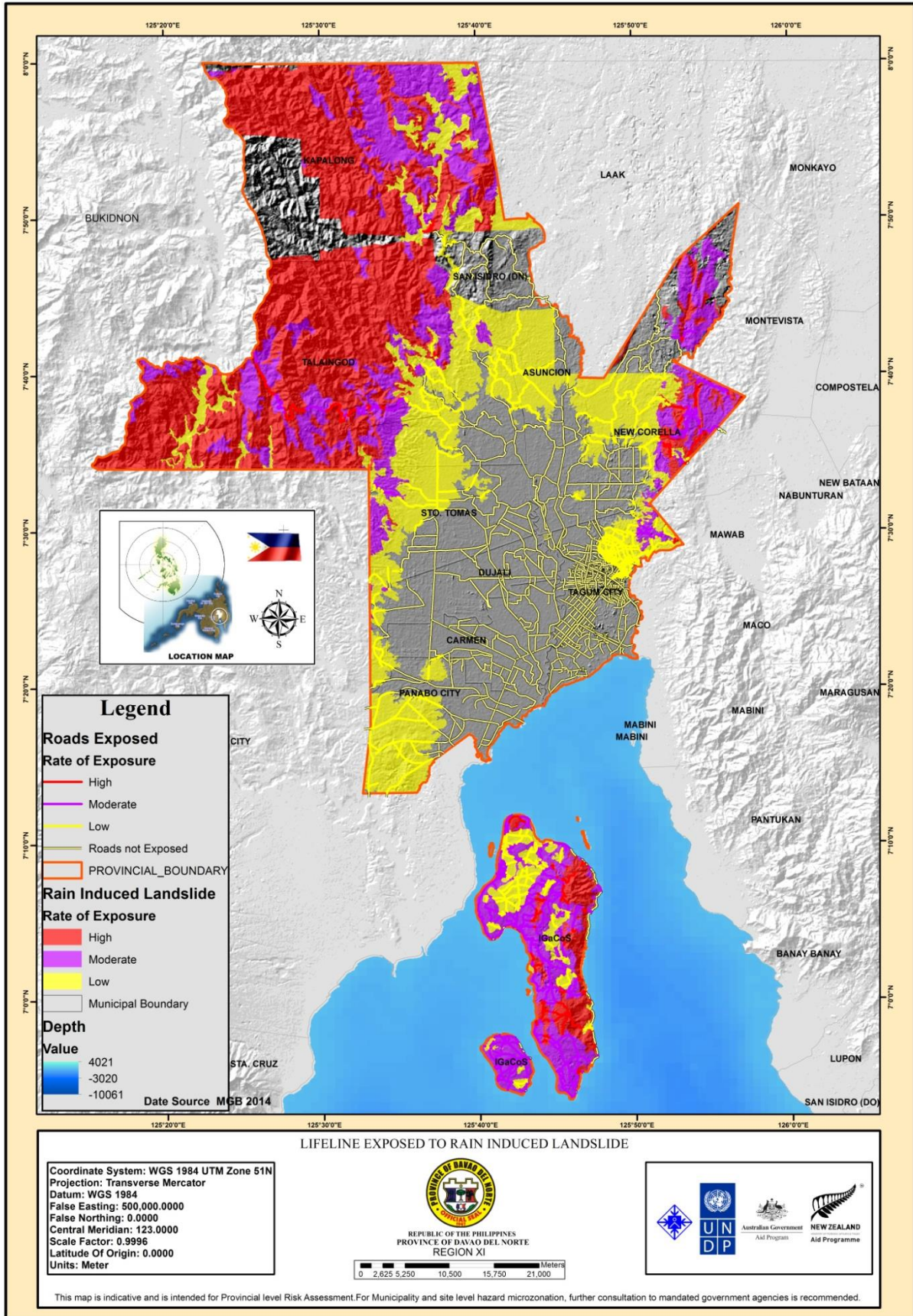


Map 37. Lifeline Exposed to Ground Shaking



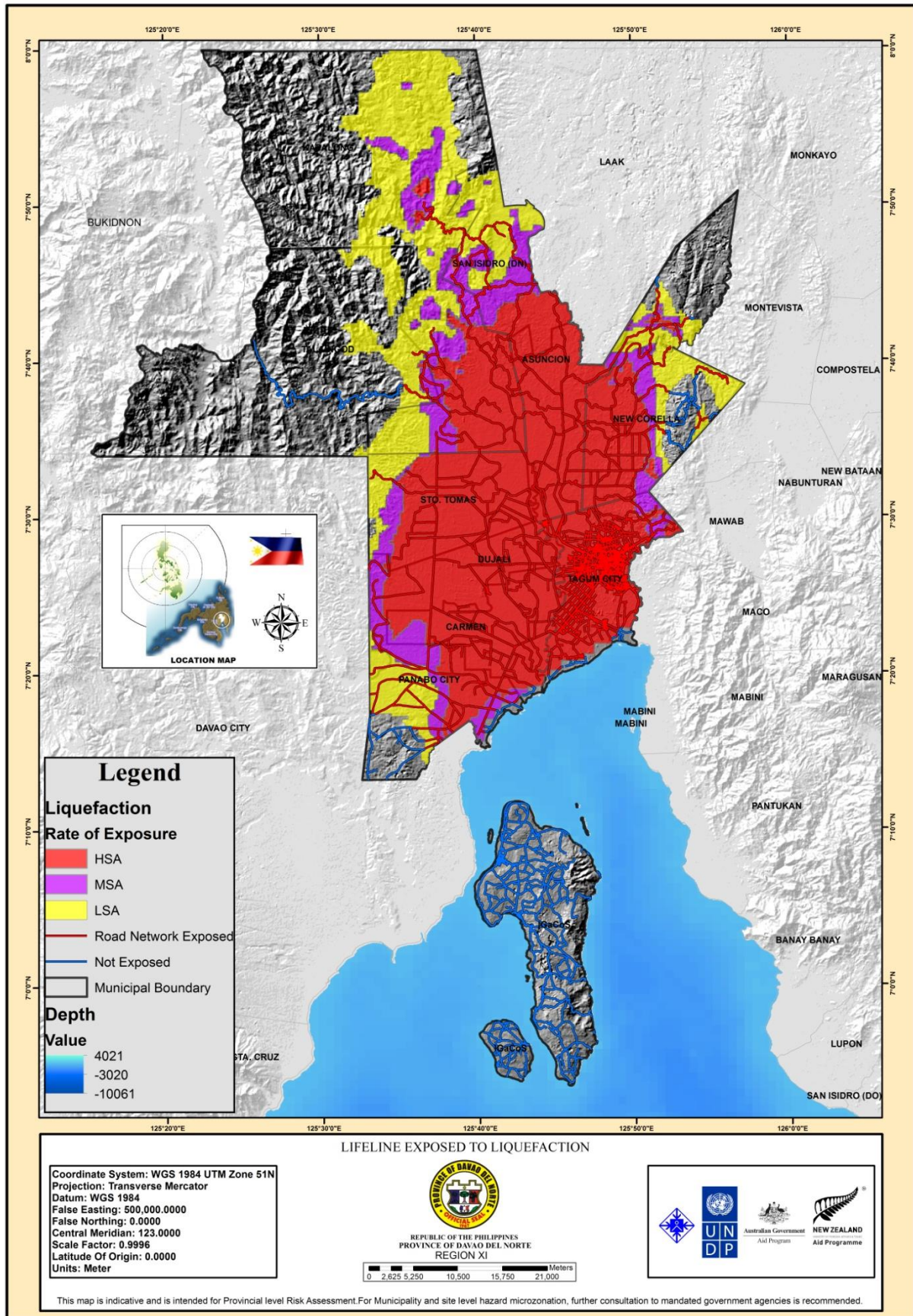


**Map 38. Lifeline Exposed to Rain Induced Landslide**





**Map 39. Lifeline Exposed to Liquefaction**





**d. LIFELINES AND ALTERNATIVE ROUTES DURING DISASTER**

**Condition of Provincial Roads Connecting the Existing National Network and Priority Hazard Prone Municipality of Davao del Norte**

Shown in the tables below are the identified high risk municipalities for Rain Induced Landslide, Liquefaction, Flood and Ground shaking which affects the Provincial Road of the province of Davao del Norte. The shortest distance or length of the affected road to the nearest national highway is determined and measured based on the hazard maps provided. This is based on the scientific information provided so that in times of disaster, access to these hazard prone areas might be totally cut-off, thereby delivery of goods and services will not be hampered.

Having these, the issues on transportation facilities which will provide lifelines and alternative routes during calamities are addressed.

Table No. -120. Alternative Routes during Rain Induced Landslide

Name of Project/Location	Administrative Classification	Road Surface Type	Road Surface Condition	Distance from the local road to the nearest Nat'l highway (in km)
<b>Asuncion</b>				
Sonlon - New Visayas - Camansa	Provincial	Earth	Fair	0.78
<b>New Corella</b>				
Limbaan - Sta. Fe - El Salvador	Provincial	Gravel	Poor	4.47
New Corella - Guadalupe - Del Monte	Provincial	Gravel	Fair	4.96
Sta. Fe - Mambing	Provincial		Poor	4.18
Carcor - Patrocenio - Jct. Bayabas	Provincial		Fair	9.18
<b>Kapalong</b>				
Sawata - Libuton - Monte Dujali - Patel	Provincial	Gravel	Fair	2.63
Jct. Patel - Langan	Provincial		Poor	1.18
<b>Talaingod</b>				
Sto. Niño - Daligdigon - Paiton	Provincial		Good	0.54
<b>TOTAL</b>	Provincial			<b>27.92</b>

**Map 40. Alternative Routes during Rain Induced Landslide**

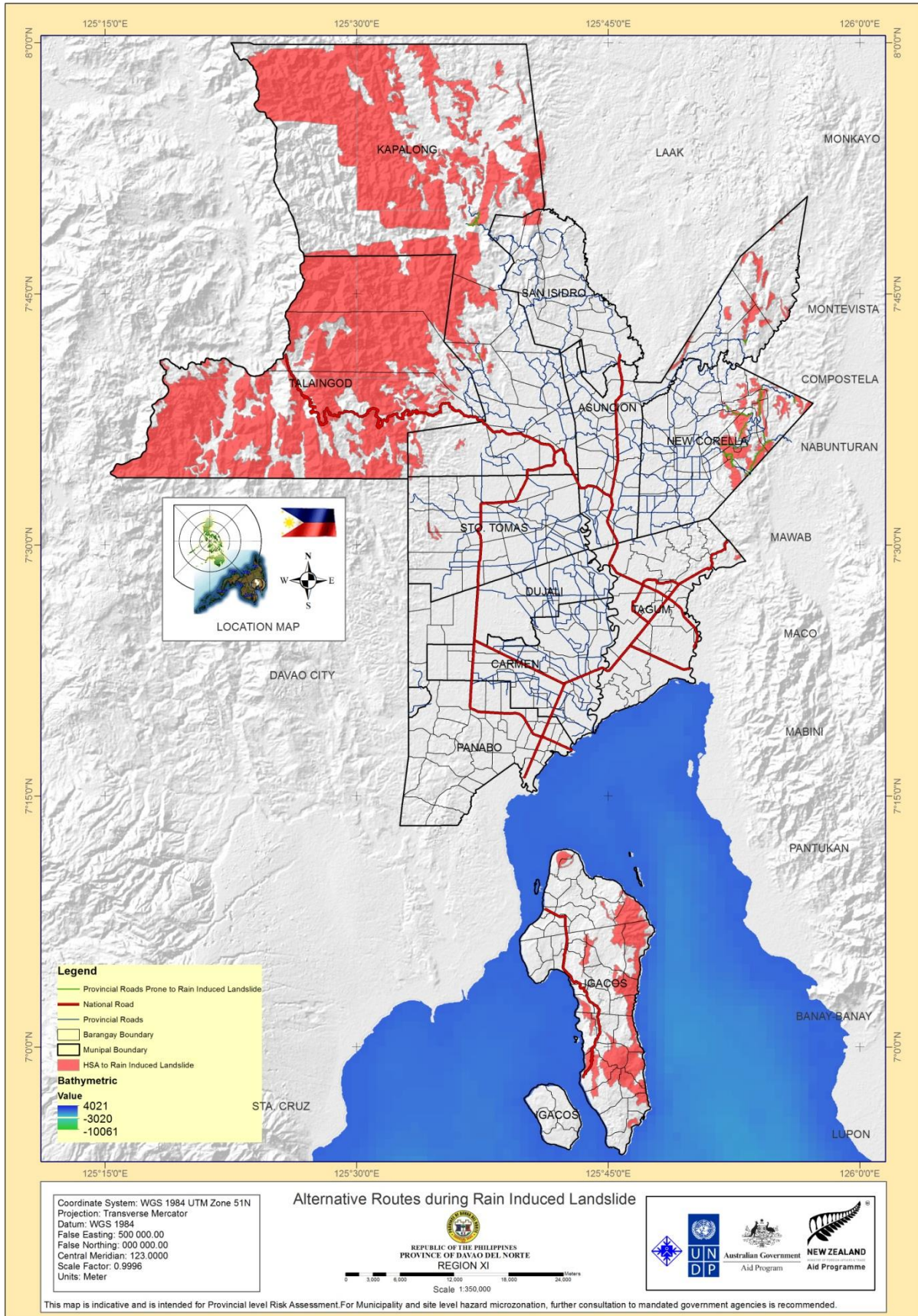


Table No. 3-121. Alternative Routes during Liquefaction

Name of Project/Location	Administrative Classification	Road Surface Type	Road Surface Condition	Dist.or length from the local road to the nearest Nat'l highway (in km)
<b>Dujali</b>				
Cabay-angan - Esperanza	Provincial	Gravel	Fair	9.16
Dujali - Balisong - Magupising	Provincial	Gravel	Fair	8.21
Dujali - San Miguel	Provincial	Gravel	Fair	6.20
Prk. 6 Cabay-angan - Esti	Provincial		Fair	10.79
Sitio Paradise - Magkakaisa - Esperanza	Provincial		Good	23.72
Jct. Salvacion - San Vicente - Cabay-angan	Provincial		Fair	12.92
Prk. Narafil - Brgy. Site Magupising	Provincial		Good	9.59
Prk. 1 to Prk. 2 SitioPawas	Provincial		Fair	10.38
PoblacionDujali - Prk. 8 Dujali	Provincial		Bad	4.65
Dujali - Pawas - San Vicente	Provincial		Bad	8.85
Dujali - New Casay	Provincial		Fair	8.67
Bacali - Casig-ang - Libertad	Provincial		Good	2.99
Dujali - SitioPawas	Provincial		Fair	9.54
Los Amigos 1 - Esperanza - Los Amigos 2	Provincial		Good	10.40
Prk. 5 - Prk. 1 Pawas - Dujali	Provincial		Fair	8.41
Jct. Highway - Tanglaw	Provincial	Gravel	Good	4.68
Dujali - Tanglaw	Provincial	Gravel	Fair	Connected to Nat'l Highway
Dujali - San Miguel	Provincial	Gravel	Fair	4.73
Dujali - Tanglaw	Provincial	Gravel	Fair	4.68
Dujali - San Isidro	Provincial	Gravel	Good	4.67
<b>New Corella</b>				
Limbaan - Sta. Fe - El Salvador	Provincial	Gravel	Fair	27.79
New Corella - Sto. Niño - Macgum	Provincial	Gravel	Fair	25.14
Del Pilar - Jct. Silangan	Provincial	Gravel	Good	15.03
New Corella - Saug	Provincial	Concrete	Good	14.57
New Corella - Guadalupe - Del Monte	Provincial	Gravel	Fair	16.45
New Corella - El Unido - Jct. Mesaoy	Provincial	Gravel	Fair	18.29
New Corella - New Bohol	Provincial	Gravel	Good	24.50
New Bohol - Jct. El Unido	Provincial		Fair	8.23
Mesaoy - New Bohol	Provincial		Fair	7.13
Mesaoy - Jct. Mahayahay	Provincial	Gravel	Fair	1.17
Del Pilar - Prk. 9 Bagsak - San Jose	Provincial	Gravel	Good	9.93
San Juan - Kauswagan - New Cortez	Provincial	Gravel	Good	7.71
San Juan - New Talisay	Provincial	Gravel	Good	2.55
Del Pilar - El Unido	Provincial		Fair	10.50
New Corella - New Sambog - Silangan	Provincial		Good	9.57

Sta. Felomina - San Roque	Provincial		Fair	29.20
Limbaan - Sto. Niño	Provincial		Good	25.70
Mesaoy - Dasing	Provincial		Fair	6.31
Pob. New Corella - Prk. 10 Pob.	Provincial		Good	14.18
Prk. 7 Pob. - Jct. New Sambog	Provincial		Good	13.51
Jct. San Juan - Jct. Mesaoy	Provincial		Good	5.27
Carcor - Patrocenio - Jct. Bayabas	Provincial		Fair	16.31
Carcor - Jct. Kauswagan	Provincial		Good	10.41
Jct. Carcor - Prk. 9 Bagsak	Provincial	Gravel	Good	13.00
Bndry. Tagum, Baka - New Corella	Provincial	Concrete	Good	15.14
<b>San Isidro</b>				
Km. 9, Sagayen - Sawata	Provincial	Gravel	Fair	Connected to Nat'l Highway
Igangon - Sawata	Provincial	Gravel	Fair	Connected to Nat'l Highway
<b>Kapalong</b>				
Pandulian - Jct. San Miguel	Provincial	Gravel	Fair	17.22
Jct. Highway - Luna - Mamacao - Narra	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Sampao - Bdry. Mamacao	Provincial	Gravel	Fair	3.37
Kapalong - Mabantao - Florida	Provincial		Good	Connected to Nat'l Highway
Florida - Suaon - Jct. Gupitan	Provincial	Gravel	Good	15.06
Jct. Patel - Langan	Provincial		Poor	35.24
Florida - New Boholano	Provincial		Good	10.84
Angelo - Dagohoy	Provincial		Good	9.04
Daligidigon - Dagohoy	Provincial		Good	9.09
Semong - Palma Gil	Provincial		Fair	1.70
Jct. Gabuyan - Semong - Dagohoy	Provincial		Good	Connected to Nat'l Highway
Jct. Gabuyan - Katipunan - Bucana	Provincial		Good	Connected to Nat'l Highway
Capungagan - Mabuhay - Pandulian	Provincial		Good	8.11
Jct. New Boholano - New Loon	Provincial		Bad	6.93
<b>Asuncion</b>				
Pamacaun - LasangBanate	Provincial	Gravel	Fair	10.29
Km. 15, Kipalili - New Loon	Provincial	Gravel	Good	Connected to Nat'l Highway
Saug - Sonlon - Bdry. Longanapan	Provincial	Gravel	Fair	14.04
Asuncion - Monte Carlo - Del Pilar	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Monte Carlo - Upper Cabaywa - Canatan	Provincial	Gravel	Good	5.92
Jct. Highway Doña Andrea - Capungagan	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Highway Canatan - Doña Andrea	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Highway Canatan - Jct. Highway	Provincial	Gravel	Good	Connected to Nat'l Highway



Magatos				Highway
Sonlon - New Visayas - Camansa	Provincial	Earth	Fair	21.10
San Vicente - Butay	Provincial		Good	1.10
Jct. Sagayen - Sonlon	Provincial		Fair	Connected to Nat'l Highway
Ilog - New Bantayan	Provincial		Good	5.34
Jct. Highway Magatos - New Bantayan	Provincial		Good	Connected to Nat'l Highway
Magatos - Bdry. Pagsabangan	Provincial		Good	Connected to Nat'l Highway
Asuncion - New Alegria - Bdry. Cuambogan	Provincial		Fair	0.81
Lower Asuncion - Upper Asuncion	Provincial		Fair	1.04
<b>Carmen</b>				
Jct. Highway Sto. Niño - Cebulano	Provincial	Gravel	Bad	Connected to Nat'l Highway
Cebulano - Mangalcal	Provincial	Gravel	Fair	2.09
Jct. Highway - Sto. Niño - Kabankalan - La Paz	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Highway Sto. Niño - La Paz - San Vicente	Provincial	Gravel	Fair	Connected to Nat'l Highway
Ising - Sto. Niño	Provincial	Gravel	Fair	0.63
Ising - Sadpodon - Taba - Diladila	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Highway Tuganay - Taba	Provincial	Gravel	Fair	Connected to Nat'l Highway
Tuganay - Anibongan - San Isidro	Provincial	Gravel	Fair	Connected to Nat'l Highway
Maligaya - New Camiling	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Highway - Ising - Magsaysay	Provincial	Gravel	Fair	Connected to Nat'l Highway
Alejal - Alemag	Provincial		Fair	Connected to Nat'l Highway
Anahaw - Maligaya	Provincial		Fair	Connected to Nat'l Highway
Jct. Highway - Carmen - Mangalcal - Tubod	Provincial		Fair	Connected to Nat'l Highway
Tubod - Basa - Mangalcal	Provincial		Fair	5.95
Cebulano - Loceta	Provincial		Fair	2.83
Loceta - Lower Mangalcal	Provincial		Fair	2.46
Jct. Highway - Tuganay - Anibongan	Provincial		Fair	Connected to Nat'l Highway
Anibongan - Salvacion - Cabay-angan	Provincial	Gravel	Fair	2.65
Mabaus - Salvacion	Provincial		Fair	7.83
Jct. Highway - Tubod - BagongSilang	Provincial		Fair	Connected to Nat'l Highway
Anibongan - Guadalupe	Provincial		Fair	1.47
Mabaus - Cabay-angan	Provincial		Fair	7.14
New Casay - BugtongTalisay	Provincial	Gravel	Fair	10.21



Upper Mangalcal - Lower Mangalcal	Provincial		Fair		3.28
New Camiling - Alejal - Lower Magsaysay	Provincial			Connected to Highway	Nat'l
Jct. Anibongan P2, 7, 5 - San Isidro	Provincial		Fair		3.21
Prk 5 RJS - Prk. 6 New Casay	Provincial				6.87
Tuganay - Taba	Provincial			Connected to Highway	Nat'l
Jct. Bdry. Tagum - Guadalupe	Provincial		Bad	Connected to Highway	Nat'l
<b>Sto. Tomas</b>					
Fd. Rd. 2 -Sto. Tomas - Magwawa	Provincial	Concrete	Fair	Connected to Highway	Nat'l
Menzi - Balagunan - Tulalian	Provincial	Gravel	Good	Connected to Highway	Nat'l
New Katipunan - Pantaron	Provincial	Gravel	Bad	Connected to Highway	Nat'l
Fd. Rd. 3 - Kimamon - Luna	Provincial	Gravel	Good	Connected to Highway	Nat'l
Pantaron - Mugas	Provincial	Gravel	Bad		2.07
Mugas - Lanatad	Provincial	Gravel	Fair		6.99
Sto. Tomas - Bdry. Mamacao	Provincial	Gravel	Fair	Connected to Highway	Nat'l
Jct. Highway - Balagunan	Provincial	Gravel	Fair	Connected to Highway	Nat'l
Jct. Highway - BugtongLubi - Balagunan	Provincial		Good	Connected to Highway	Nat'l
NAFCO - Bobongon	Provincial		Good	Connected to Highway	Nat'l
FD RD 3 - San Jose	Provincial		Good	Connected to Highway	Nat'l
San Miguel - Libertad	Provincial		Good	Connected to Highway	Nat'l
San Miguel - Casig-ang	Provincial		Good		6.37
Prk. Magsaysay - Lunga-og - Dalisay	Provincial		Good		8.13
Prk. Apitong - Upper Balisong - Dalisay	Provincial		Good		9.16
Mugas - Lunga-og	Provincial		Fair		6.14
Jct. Bdry. Tagum - Talomo	Provincial		Fair		10.19
Kimamon - Lungaog - Talomo	Provincial		Fair		4.75
Kinamayan - Moslog - Mahayag	Provincial		Fair		7.81
San Miguel - Moslog - Kinamayan	Provincial				6.18
Kinamayan - Lunga-og	Provincial	Gravel	Fair		8.13
San Miguel - Crossing Kinamayan	Provincial	Gravel	Fair		6.20
Bdry. Tagum - Crossing Kinamayan - Sto. Tomas	Provincial		Bad	Connected to Highway	Nat'l
<b>Talaingod</b>					
Sto. Niño - Daligdigon - Paiton	Provincial		Good		5.25
<b>Panabo</b>					
Tubod - Pilar	Provincial		Fair		4.34
Basa - Tubod	Provincial		Fair		2.49

**Map 41. Alternative Routes during Liquefaction**

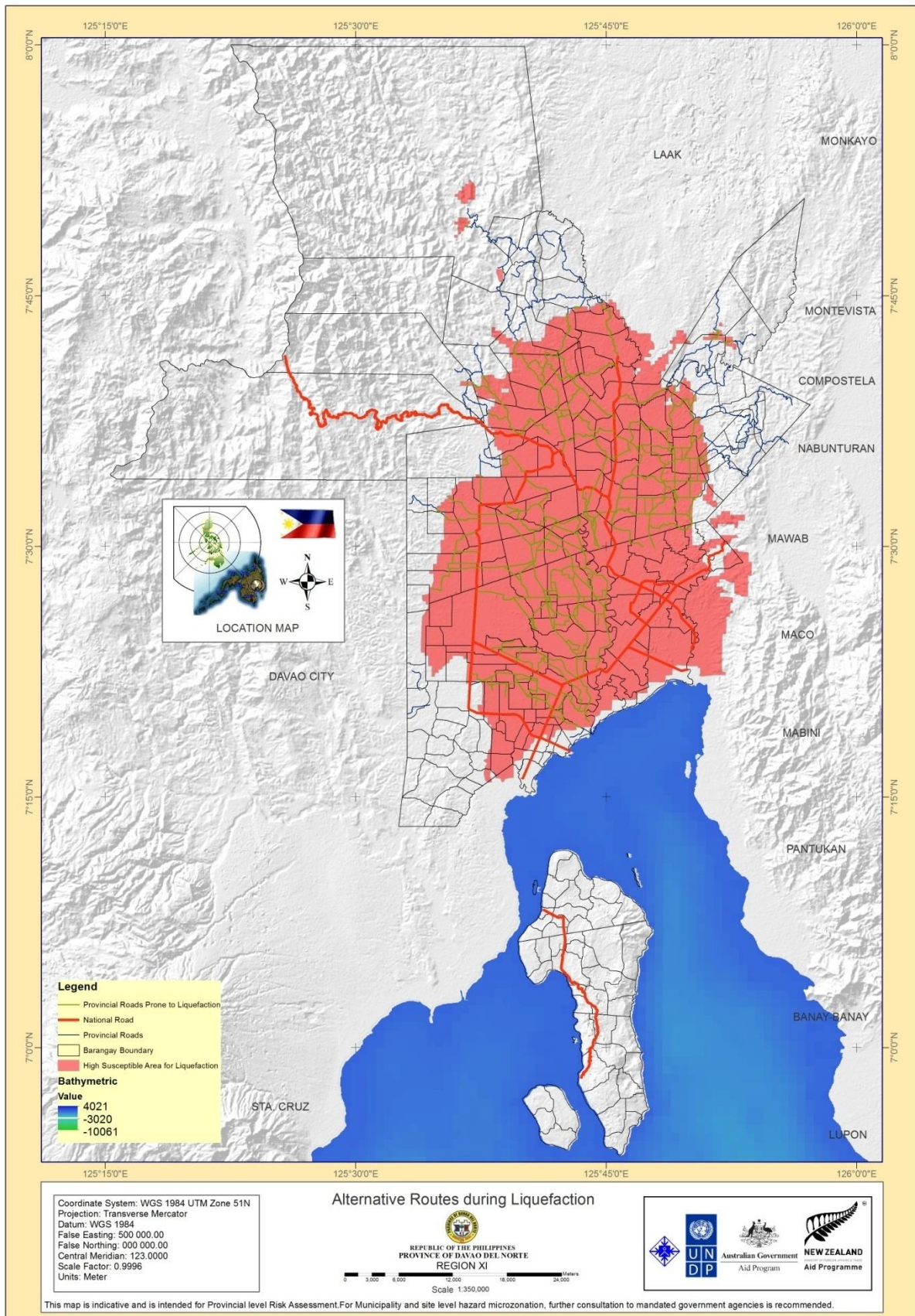


Table No. 3-122. Alternative Routes during Flooding

NAME OF PROJECT/LOCATION	ADMINISTRATIVE CLASSIFICATION	ROAD SURFACE TYPE	ROAD SURFACE CONDITION	Dist. or length from the local road to the nearest Nat'l. highway (in Km)
<b>B.E. Dujali</b>				
Cabay-angan - Esperanza	Provincial	Gravel	Fair	8.89
Dujali - Balisong - Magupising	Provincial	Gravel	Fair	9.94
Cabay-angan - Esperanza	Provincial	Gravel	Fair	7.75
Dujali - Balisong - Magupising	Provincial	Gravel	Fair	8.54
Prk. Narafil - Brgy. Site Magupising	Provincial		Good	9.52
Prk. 1 to Prk. 2 Sitio Pawas	Provincial		Fair	10.48
Poblacion Dujali - Prk. 8 Dujali	Provincial		Bad	4.81
New Casay - Bugtong Talisay	Provincial	Gravel	Fair	10.88
Dujali - Pawas - San Vicente	Provincial		Bad	9.33
Dujali - Sitio Pawas	Provincial		Fair	9.6
Prk 5 RJS - Prk. 6 New Casay	Provincial			8.19
Prk. 5 - Prk. 1 Pawas - Dujali	Provincial		Fair	8.72
Dujali - Tanglaw	Provincial	Gravel	Fair	4.75
Jct. Salvacion - San Vicente - Cabay-angan	Provincial		Fair	14.86
Dujali - San Miguel	Provincial	Gravel	Fair	6.17
<b>Sto. Tomas</b>				
Prk. Apitong - Upper Balisong - Dalisay	Provincial		Good	9.34
Bdry. Tagum - Crossing Kinamayan - Sto. Tomas	Provincial		Bad	11.15
Sitio Paradise - Magkakaisa - Esperanza	Provincial		Good	13.65
Jct. Bdry. Tagum - Talomo	Provincial		Fair	8.13
Kimamon - Lungaog - Talomo	Provincial		Fair	9.28
Los Amigos 1 - Esperanza - Los Amigos 2	Provincial		Good	11.31
Fd. Rd. 3 - Kimamon - Luna	Provincial	Gravel	Good	3.76
Mugas - Lanatad	Provincial	Gravel	Fair	8.34
Jct. Highway - Balagunan	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Highway - Bugtong Lubi - Balagunan	Provincial		Good	0.98
Jct. Bdry. Tagum - Guadalupe	Provincial		Bad	Connected to Nat'l Highway
Bdry. Tagum - Crossing Kinamayan - Sto. Tomas	Provincial		Bad	7.85
San Miguel - Libertad	Provincial		Good	Connected to Nat'l Highway
San Miguel - Casig-ang	Provincial		Good	5.42
Jct. Bdry. Tagum - Talomo	Provincial		Fair	17.71

Kimamon - Lungaog - Talomo	Provincial		Fair	4.84
Kinamayan - Moslog - Mahayag	Provincial		Fair	7.52
Bacali - Casig-ang - Libertad	Provincial		Good	3.03
San Miguel - Moslog - Kinamayan	Provincial			6.14
San Miguel - Crossing Kinamayan	Provincial	Gravel	Fair	6.2
Jct. Highway - Tanglaw	Provincial	Gravel	Good	Connected to Nat'l Highway
<b><i>New Corella</i></b>				
New Corella - Sto. Niño - Macgum	Provincial	Gravel	Fair	17.95
Del Pilar - Jct. Silangan	Provincial	Gravel	Good	9.56
New Corella - El Unido - Jct. Mesaoy	Provincial	Gravel	Fair	8.78
San Juan - Kauswagan - New Cortez	Provincial	Gravel	Good	8.7
New Corella - Sto. Niño - Macgum	Provincial	Gravel	Fair	17.02
Del Pilar - Jct. Silangan	Provincial	Gravel	Good	12.27
New Corella - Saug	Provincial	Concrete	Good	16.71
New Corella - El Unido - Jct. Mesaoy	Provincial	Gravel	Fair	5.52
New Corella - New Bohol	Provincial	Gravel	Good	11.34
Bndry. Tagum, Baka - New Corella	Provincial	Concrete	Good	5.62
Del Pilar - Prk. 9 Bagsak - San Jose	Provincial	Gravel	Good	10.04
San Juan - Kauswagan - New Cortez	Provincial	Gravel	Good	7.98
New Bohol - Jct. El Unido	Provincial		Fair	8.44
Mesaoy - New Bohol	Provincial		Fair	7.14
San Juan - New Talisay	Provincial	Gravel	Good	2.6
Mesaoy - Dasing	Provincial		Fair	6.04
Prk. 7 Pob. - Jct. New Sambog	Provincial		Good	13.08
Jct. San Juan - Jct. Mesaoy	Provincial		Good	5.31
Jct. Carcor - Prk. 9 Bagsak	Provincial	Gravel	Good	14.61
<b><i>Kapalong</i></b>				
Florida - Suaon - Jct. Gupitan	Provincial	Gravel	Good	13.15
Jct. Gabuyan - Katipunan - Bucana	Provincial		Good	4.3
Jct. Highway - Luna - Mamacao - Narra	Provincial	Gravel	Fair	3.42
Kapalong - Mabantao - Florida	Provincial		Good	Connected to Nat'l Highway
Florida - Suaon - Jct. Gupitan	Provincial	Gravel	Good	12.15
Semong - Palma Gil	Provincial		Fair	1.88
Jct. Gabuyan - Semong - Dagohoy	Provincial		Good	5.02
Jct. Gabuyan - Katipunan - Bucana	Provincial		Good	1.5
<b><i>Asuncion</i></b>				
Jct. Monte Carlo - Upper Cabaywa - Canatan	Provincial	Gravel	Good	9.18
Jct. Highway Canatan - Doña Andrea	Provincial	Gravel	Fair	0.64
San Vicente - Butay	Provincial		Good	6.62
New Corella - New Sambog - Silangan	Provincial		Good	9.13
Sta. Felomina - San Roque	Provincial		Fair	10.21
Jct. Sagayen - Sonlon	Provincial		Fair	Connected to



				Nat'l Highway
Magatos - Bdry. Pagsabangan	Provincial		Good	Connected to Nat'l Highway
Asuncion - New Alegria - Bdry. Cuambogan	Provincial		Fair	2.52
Asuncion - Monte Carlo - Del Pilar	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Monte Carlo - Upper Cabaywa - Canatan	Provincial	Gravel	Good	8.18
Jct. Highway Doña Andrea - Capungagan	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Highway Canatan - Doña Andrea	Provincial	Gravel	Fair	Connected to Nat'l Highway
San Vicente - Butay	Provincial		Good	1.43
Mesaoy - Jct. Mahayahay	Provincial	Gravel	Fair	0.98
New Corella - New Sambog - Silangan	Provincial		Good	11.71
Ilog - New Bantayan	Provincial		Good	4.76
Jct. Highway Magatos - New Bantayan	Provincial		Good	2.51
Magatos - Bdry. Pagsabangan	Provincial		Good	2.07
Asuncion - New Alegria - Bdry. Cuambogan	Provincial		Fair	0.67
Jct. Highway Canatan - Jct. Highway Magatos	Provincial	Gravel	Good	Connected to Nat'l Highway
<b>Carmen</b>				
Prk. 6 Cabay-angan - Esti	Provincial		Fair	9.37
Mabaus - Cabay-angan	Provincial		Fair	9.64
Ising - Sadpodon - Taba - Diladila	Provincial	Gravel	Fair	2.11
Jct. Highway Tuganay - Taba	Provincial	Gravel	Fair	Connected to Nat'l Highway
Tuganay - Anibongan - San Isidro	Provincial	Gravel	Fair	Connected to Nat'l Highway
Anahaw - Maligaya	Provincial		Fair	Connected to Nat'l Highway
Anibongan - Salvacion - Cabay-angan	Provincial	Gravel	Fair	4.05
Mabaus - Salvacion	Provincial		Fair	7.96
Dalisay - Mabuhay	Provincial		Fair	4.19
Anibongan - Guadalupe	Provincial		Fair	1.59
Mabaus - Cabay-angan	Provincial		Fair	13
Jct. Anibongan P2, 7, 5 - San Isidro	Provincial		Fair	3.3
Tuganay - Taba	Provincial			3.36
Maligaya - New Camiling	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Highway - Ising - Magsaysay	Provincial	Gravel	Fair	Connected to Nat'l Highway
New Camiling - Alejal - Lower Magsaysay	Provincial			1.28



<b><i>San Isidro</i></b>				
Km. 9, Sagayen - Sawata	Provincial	Gravel	Fair	Connected to Nat'l Highway
Sawata - Mamangan - Pinamuno	Provincial		Fair	11.24
<b><i>Talaingod</i></b>				
Sto. Niño - Daligdigon - Paiton	Provincial		Good	7.72
Sto. Niño - Palma Gil - Jct. Opao	Provincial		Good	1.8

**Map 42. Alternative Routes during Flooding**

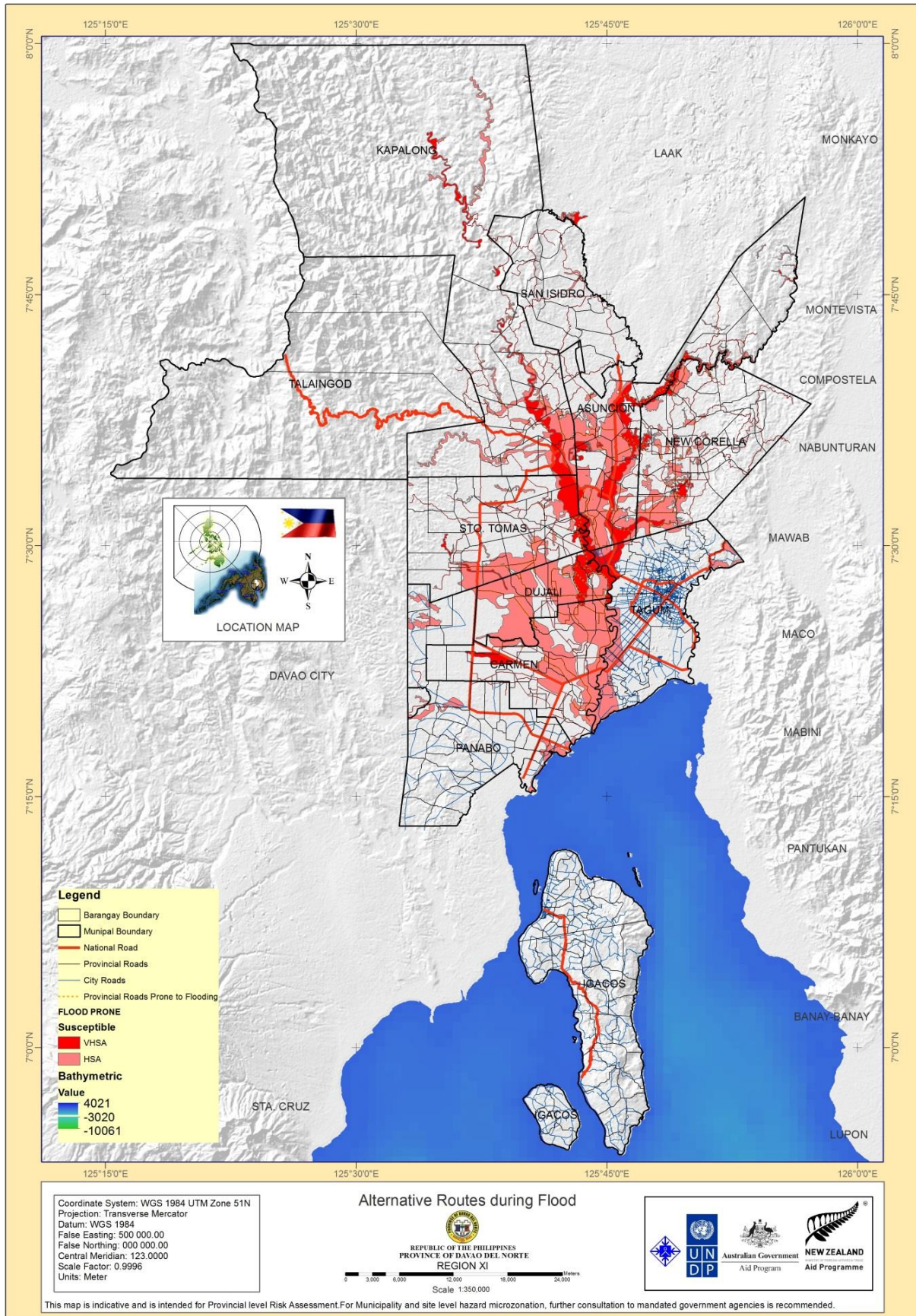


Table No. 3-123. Alternative Routes during Ground Shaking

Name of Project/Location	Administrative Classification	Road Surface Type	Road Surface Condition	Dist.or length from the local road to the nearest Nat'l highway (in km)
<b>Asuncion</b>				
Pamacaun - LasangBanate	Provincial	Gravel	Fair	5.26
Km. 15, Kipalili - New Loon	Provincial	Gravel	Good	Connected to Nat'l Highway
Asuncion - Monte Carlo - Del Pilar	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Monte Carlo - Upper Cabaywa - Canatan	Provincial	Gravel	Good	5.81
Jct. Highway Doña Andrea - Capungagan	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Highway Canatan - Doña Andrea	Provincial	Gravel	Fair	Connected to Nat'l Highway
San Vicente - Butay	Provincial		Good	1.44
Mesaoy - Jct. Mahayahay	Provincial	Gravel	Fair	1.16
New Corella - New Sambog - Silangan	Provincial		Good	13.77
Sta. Felomina - San Roque	Provincial		Fair	10.30
Jct. Sagayen - Sonlon	Provincial		Fair	Connected to Nat'l Highway
Ilog - New Bantayan	Provincial		Good	Connected to Nat'l Highway
Jct. Highway Magatos - New Bantayan	Provincial		Good	Connected to Nat'l Highway
Magatos - Bdry. Pagsabangan	Provincial		Good	Connected to Nat'l Highway
Asuncion - New Alegria - Bdry. Cuambogan	Provincial		Fair	0.82
Jct. New Boholano - New Loon	Provincial		Bad	6.97
Jct. Highway Canatan - Jct. Highway Magatos	Provincial	Gravel	Good	Connected to Nat'l Highway
Jct. Sagayen - Sonlon	Provincial		Fair	7.31
<b>B.E. Dujali</b>				
Cabay-angan - Esperanza	Provincial	Gravel	Fair	7.97
Dujali - Balisong - Magupising	Provincial	Gravel	Fair	10.71
Prk. Narafil - Brgy. Site Magupising	Provincial		Good	9.65
Prk. 1 to Prk. 2 SitioPawas	Provincial		Fair	12.22
PoblacionDujali - Prk. 8 Dujali	Provincial		Bad	9.42

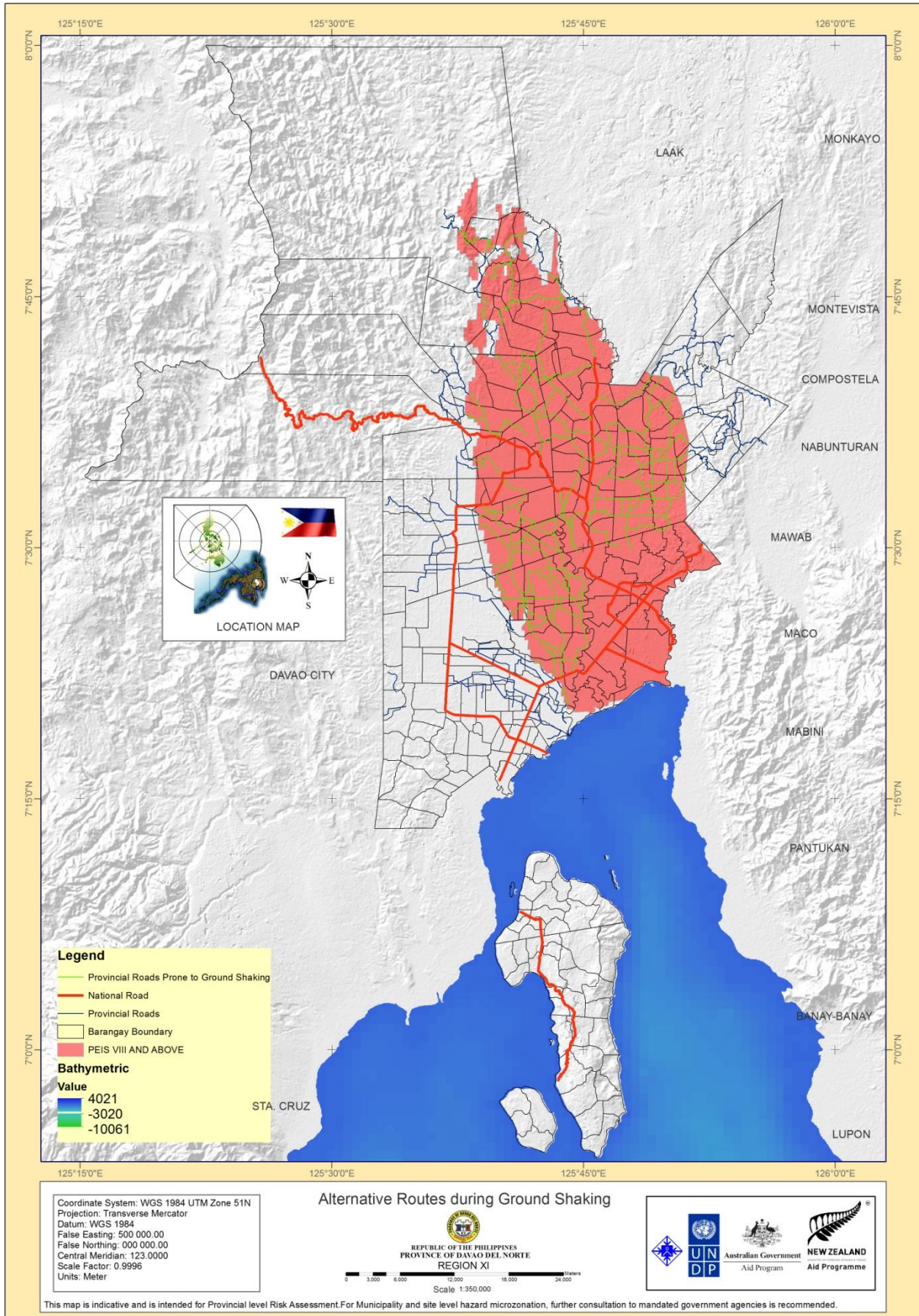
New Casay - BugtongTalisay	Provincial	Gravel	Fair	8.15
Dujali - Pawas - San Vicente	Provincial		Bad	11.89
Dujali - New Casay	Provincial		Fair	6.32
Dujali - SitioPawas	Provincial		Fair	9.63
Prk 5 RJS - Prk. 6 New Casay	Provincial			6.92
Prk. 5 - Prk. 1 Pawas - Dujali	Provincial		Fair	9.77
Dujali - San Isidro	Provincial	Gravel	Good	8.68
Dujali - Tanglaw	Provincial	Gravel	Fair	5.77
Dujali - San Isidro	Provincial	Gravel	Good	8.19
Jct. Salvacion - San Vicente - Cabay-angan	Provincial		Fair	13.20
Dujali - San Miguel	Provincial	Gravel	Fair	6.15
<b>Carmen</b>				
Jct. Highway Tuganay - Taba	Provincial	Gravel	Fair	Connected to Nat'l Highway
Tuganay - Anibongan - San Isidro	Provincial	Gravel	Fair	Connected to Nat'l Highway
Anahaw - Maligaya	Provincial		Fair	2.03
Jct. Highway - Tuganay - Anibongan	Provincial		Fair	Connected to Nat'l Highway
Anibongan - Salvacion - Cabay-angan	Provincial	Gravel	Fair	2.60
Mabaus - Salvacion	Provincial		Fair	7.84
Anibongan - Guadalupe	Provincial		Fair	1.48
Prk. 6 Cabay-angan - Esti	Provincial		Fair	8.13
Mabaus - Cabay-angan	Provincial		Fair	7.18
Jct. Anibongan P2, 7, 5 - San Isidro	Provincial		Fair	3.28
<b>Kapalong</b>				
Pandulian - Jct. San Miguel	Provincial	Gravel	Fair	9.26
Jct. Suaon - Libuton	Provincial	Gravel	Fair	16.27
Jct. Highway - Luna - Mamacao - Narra	Provincial	Gravel	Fair	Connected to Nat'l Highway
Jct. Sampao - Bdry. Mamacao	Provincial	Gravel	Fair	3.28
Kapalong - Mabantao - Florida	Provincial		Good	Connected to Nat'l Highway
Florida - Suaon - Jct. Gupitan	Provincial	Gravel	Good	12.03
Monte Dujali - Gupitan	Provincial		Fair	26.75
Florida - New Boholano	Provincial		Good	12.54
Semong - Palma Gil	Provincial		Fair	2.84
Jct. Gabuyan - Semong - Dagohoy	Provincial		Good	Connected to Nat'l Highway
Jct. Gabuyan - Katipunan - Bucana	Provincial		Good	0.20
Capungagan - Mabuhay - Pandulian	Provincial		Good	4.71
Sawata - Libuton - Monte Dujali - Patel	Provincial	Gravel	Fair	9.22
<b>New Corella</b>				
New Corella - Sto. Niño - Macgum	Provincial	Gravel	Fair	13.36
Del Pilar - Jct. Silangan	Provincial	Gravel	Good	12.17
New Corella - Saug	Provincial	Concrete	Good	14.52
New Corella - El Unido - Jct. Mesaoy	Provincial	Gravel	Fair	5.70
New Corella - New Bohol	Provincial	Gravel	Good	10.79

Bndry. Tagum, Baka - New Corella	Provincial	Concrete	Good	9.79
Del Pilar - Prk. 9 Bagsak - San Jose	Provincial	Gravel	Good	9.80
San Juan - Kauswagan - New Cortez	Provincial	Gravel	Good	7.67
New Bohol - Jct. El Unido	Provincial		Fair	8.18
Mesaoy - New Bohol	Provincial		Fair	7.12
San Juan - New Talisay	Provincial	Gravel	Good	2.56
Del Pilar - El Unido	Provincial		Fair	9.59
Limbaan - Sto. Niño	Provincial		Good	35.52
Mesaoy - Dasing	Provincial		Fair	6.26
Pob. New Corella - Prk. 10 Pob.	Provincial		Good	14.04
Prk. 7 Pob. - Jct. New Sambog	Provincial		Good	13.26
Jct. San Juan - Jct. Mesaoy	Provincial		Good	5.44
Carcor - Jct. Kauswagan	Provincial		Good	10.40
Limbaan - Sta. Fe - El Salvador	Provincial	Gravel	Fair	18.58
New Corella - Sto. Niño - Macgum	Provincial	Gravel	Fair	23.01
New Corella - Saug	Provincial	Concrete	Good	20.96
New Corella - New Bohol	Provincial	Gravel	Good	11.78
Del Pilar - Prk. 9 Bagsak - San Jose	Provincial	Gravel	Good	13.81
Limbaan - Sto. Niño	Provincial		Good	22.96
Carcor - Patrocenio - Jct. Bayabas	Provincial		Fair	17.68
Jct. Carcor - Prk. 9 Bagsak	Provincial	Gravel	Good	13.22
New Corella - Guadalupe - Del Monte	Provincial	Gravel	Fair	17.09
<b>San Isidro</b>				
Jct. Dacudao - Mabuhay	Provincial	Earth	Fair	20.89
Km. 9, Sagayen - Sawata	Provincial	Gravel	Fair	Connected to Nat'l Highway
Igangan - Sawata	Provincial	Gravel	Fair	Connected to Nat'l Highway
Sawata - Mamangan - Pinamuno	Provincial		Fair	9.66
DatuBalong - Pinamuno	Provincial		Fair	22.19
Sto. Tomas				
New Katipunan - Pantaron	Provincial	Gravel	Bad	Connected to Nat'l Highway
Fd. Rd. 3 - Kimamon - Luna	Provincial	Gravel	Good	Connected to Nat'l Highway
Mugas - Lanatad	Provincial	Gravel	Fair	5.35
Jct. Bdry. Tagum - Guadalupe	Provincial		Bad	Connected to Nat'l Highway
Bdry. Tagum - Crossing Kinamayan - Sto. Tomas	Provincial		Bad	7.86
Sitio Paradise - Magkakaisa - Esperanza	Provincial		Good	13.65
San Miguel - Libertad	Provincial		Good	9.19
San Miguel - Casig-ang	Provincial		Good	9.34
Prk. Magsaysay - Lunga-og - Dalisay	Provincial		Good	8.50
Prk. Apitong - Upper Balisong - Dalisay	Provincial		Good	9.53
Mugas - Lunga-og	Provincial		Fair	5.33
Jct. Bdry. Tagum - Talomo	Provincial		Fair	7.87
Kimamon - Lungaog - Talomo	Provincial		Fair	4.75
Kinamayan - Moslog - Mahayag	Provincial		Fair	9.30
Bacali - Casig-ang - Libertad	Provincial		Good	5.10



San Miguel - Moslog - Kinamayan	Provincial			8.06
Kinamayan - Lunga-og	Provincial		Fair	8.06
Los Amigos 1 - Esperanza - Los Amigos 2	Provincial		Good	10.39
San Miguel - Crossing Kinamayan	Provincial	Gravel	Fair	6.16
Pantaron - Mugas	Provincial	Gravel	Bad	2.06
San Miguel - Libertad	Provincial		Good	4.13

**Map 43. Alternative Routes during Ground Shaking**



## 5.2.9 Environmental Issues

### *a. Environmental Management Plan*

An environmental management plan (EMP) for road projects, also referred to as an impact management plan, is usually prepared as part of Environmental Impact Assessment (EIA) reporting. It will form the basis for impact management during project construction and operation.

Formulation of environmental management plans was introduced through the conduct of capacity building in order to strictly impose compliance to the fact based recommendations from environmental investigation especially on protected and high risk areas.

Full implementation of integrating EMPs on local road projects is fundamental to social environmental safeguards.

### *b. Wildlife Corridor*

A wildlife or green corridor is an area of habitat connecting wild animals living in nature separated by human activities or structure such as roads and development. The corridor allows continued wild inbreeding and genetic diversity.

The corridor may potentially moderate some of the worst effects of habitat fragmentation, wherein urbanization can split up habitat areas. Habitat fragmentation due to human development is an ever-increasing threat to biodiversity and habitat corridors are a possible mitigation.

At present, this concern was not really given utmost consideration in the current practices in the design and implementation of various infrastructure projects. It is, however, desired to be incorporated to the design guidelines in the future.

## 5.2.10 Sea Transport

### *a. Access*

The Island Garden City of Samal can be reached only by sea through the ferry landing and wharf located at Km. 11, Sasa District, Davao City and Sta. Ana Wharf at downtown Davao City. At present, RORO facilities bridge IgaCos to the mainland. Vehicles going to the main island may only pass through the ferry landings. Vessels depart regularly every fifteen (15) minutes from 5:00 AM until 11:00 PM daily.

There are two types of facilities on marine transportation available in the island namely, terminal ports and private domestic shipping. The primary landing facility is located at Brgy. Kinawitnon, Babak, District. These privately owned RoRo facilities provides marine transport service to almost all types of vehicles (e.g. bus, vans, trucks, cars, motorcycles, etc). Another, more recent similar facility started offering similar services nearby towards the Villarica Wharf, albeit on a far more limited capacity. Ferry services became a major means of transport of goods and commodities of the island.

There are many other entry points in the entire island. The different beach resorts have their own seacrafts and utilize their private wharves in transporting visitors and tourists. Other sea transportation options include water taxis and private speed and pumpboats that may bring travelers to any point in the island group at a cost.

Talikud Island, however, may only be reached through smaller boats, either coming from Sta. Ana Wharf in Davao City (around 1 hour and 20 minutes travel time). This route allows plight of vessels on a limited period of the day and is dependent on weather conditions, thereby limiting the traffic of tourists and goods. Another access is from Kaputian Wharf at Brgy. Poblacion Kaputian (around 15 minutes travel time) which is located in the immediate vicinity of Kaputian Beach Park. Continued increase in the traffic of tourists from this wharf may soon contribute to adverse effects in the environmental condition of the said beach park.

Wharves are the main points of access to and from the island. Table below shows LGU-owned facilities are located at Brgys. Villarica, Kinawitnon of Babak District, Poblacion Kaputian and ADECOR of Kaputian district in the main island and also in Brgys. Dadatan, Cogon and Sta. Cruz in Talikud Island.

**Table No. 3-124: List of Existing Wharves in the Island Garden City of Samal  
Province of Davao del Norte, 2013**

NAME	LOCATION	OWNERSHIP	MAJOR CARGOS
Babak Wharf	Brgy. Villarica (Babak)	LGU	Public Utility
Kaputian Wharf	Brgy. Poblacion (Kaputian)	LGU	Public Utility
Sta. Cruz Wharf	Brgy. Sta. Cruz, Talikud Island	LGU	Public Utility
ADECOR Wharf	Brgy. ADECOR (Kaputian)	LGU	Chartered Boat
Mansud Wharf	Brgy. Dadatan, Talikud Island	LGU	Public Utility
Cogon Wharf	Brgy. Cogon, Talikud Island	LGU	Public Utility
Ferry Boat Landing	Brgy. Kinawitnon (Babak)	LGU	Public Utility

*Source: IgaCos Socio Economic and Physical Profile 2012*

No less than 50 motorboats transport passengers and goods from the different coastal barangays of IGaCoS to Davao City. Motorized bancas ferry passengers from various points in the island to Davao City, particularly at Sta. Ana Wharf and Sasa Wharf. On peak days, it is estimated that about 3,000 to 5,000 visitors troop to various beaches of IGaCoS. Among key sun and beach destination points of tourists are the Paradise Beach Resort, Pearl Farm Resort, Hof Gorei Resort, Bluejaz Resort, Secdea Beach Resort, Babusanta Beach Resort, Leticia by the Sea and Isla Reta Beach Resort. Natural major attraction sites also include the Monfort Bat Sanctuary, a bat cave that set a Guinness World Record for the largest colony of fruit bats, Sanipaan Shoal, Mansud Wall, Angels Cove and Coral Garden Marine Park.

**b. Sea Transport Facilities exposed to Storm Surge**

13.90% of Barangays in Davao del Norte is on the coastal areas, both on the mainland and the Island Garden City of Samal. These barangays are, therefore, considered high risk areas for storm surge.

A computer-generated map of Storm Surge was created by Department of Science and Technology – Nationwide Operational Assessment of Hazards (DOST-NOAH), was based on typhoon Yolanda. The storm surge advisory height of five (5) meters was considered as worst case scenario. Almost all of the 31 barangays along the coastal area of the province are in the high susceptible for storm surge. Considering the extreme weather condition experienced globally due to climate change, sea ports are prone to storm surge, tsunami and sea level rise.

In the record of the earthquake incidence index of the Province of Davao del Norte there are epicenters which can be located at the Davao Gulf. With this there is a strong possibility of tsunami occurrence.

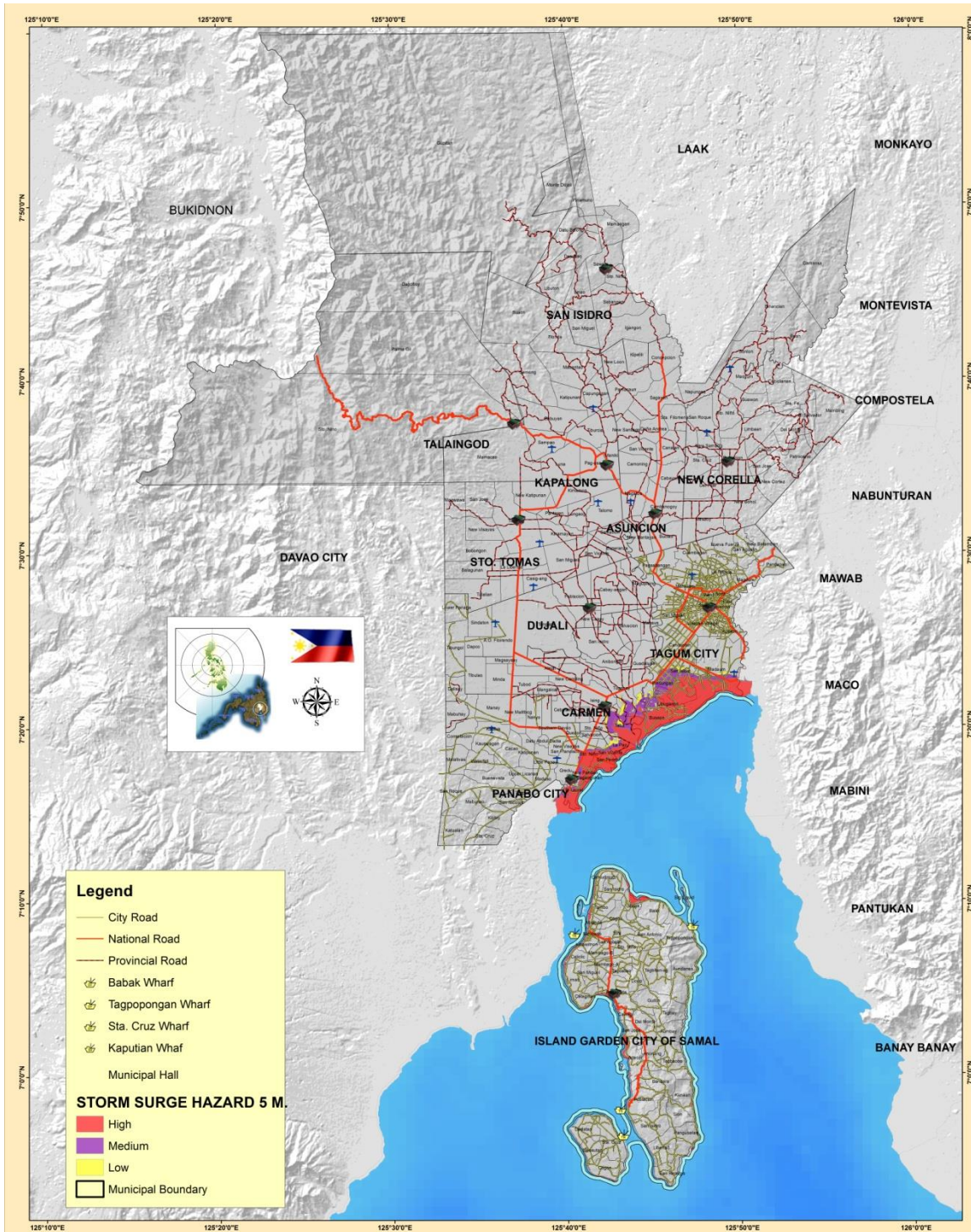
**Table 3-125: List of Earthquake Incidence in Davao del Norte, 2011**

Number	Year	Magnitude	Longitude	Latitude
1	1878	6.5	125.7485	6.9516
2	1963	6.1	125.9005	7.8005
3	1964	5.9	125.6995	6.9015
4	1969	5.4	125.7275	7.1725
5	1985	5.2	125.6925	6.9145
6	1981	5.2	125.641	7.001
7	2006	5.1	125.833	7.048
8	1995	4.9	125.8005	7.3995
9	1992	4.9	125.637	6.727
10	1991	4.9	125.7105	6.8715
11	1993	4.8	125.6545	6.9455
12	2015	4.6	125.44	7.600
13	1998	4.6	125.803	6.899
14	1995	4.6	125.8615	6.9465
15	1994	4.6	125.651	7.511
16	1987	4.6	125.7595	7.3775
17	1995	4.5	125.607	6.817
18	1987	4.5	125.6275	7.9405
19	2015	4.4	125.46	7.5700
20	2015	3.7	125.45	7.6200
21	2015	3.7	125.49	7.6000
22	2015	3.6	125.55	7.5500
23	2015	3.6	125.35	7.5600
24	2015	3.5	125.43	7.6100



25	2015	3.4	125.47	7.6300
26	2015	3.4	125.4	7.600
27	2015	3.4	125.46	7.5700
28	2015	3.2	125.43	7.5700
29	2011	3.2	126.24	7.8200
30	2015	3	125.38	7.5300
31	2015	2.8	125.57	7.6600

Map 44. Wharves Exposed to Storm Surge



Map Source: PROVINCIAL PLANNING AND DEVELOPMENT OFFICE

WHARVES EXPOSED TO STORM SURGE MAP

Coordinate System: WGS 1984 UTM Zone 51N  
 Projection: Transverse Mercator  
 Datum: WGS 1984  
 false easting: 500,000.0000  
 false northing: 0.0000  
 central meridian: 123.0000  
 scale factor: 0.9996  
 latitude of origin: 0.0000  
 Units: Meter



REPUBLIC OF THE PHILIPPINES  
 PROVINCE OF DAVAO DEL NORTE  
 REGION XI



This map is indicative and is intended for Provincial level Risk Assessment. For Municipality and site level hazard microzonation, further consultation to mandated government agencies is recommended.

### 5.2.11 Air Transport

Due to the presence of banana plantations in the province, private airstrips are available for crop dusters. Please refer to the table below; showing the presence of the airstrips in some municipalities.

Table 3-126. – List of Private Airstrips in the Province by Municipality, 2013

Municipality	Location	Company	No. of Strips
Asuncion	Magatos	DOLE	1
Kapalong	Sampao/Capungagan	AMS/Lapanday	2
New Corella	Macgum/San Roque	-	2
Sto. Tomas	Pob. Tibal-og/La Libertad/Kimamon	Marsman/Farming Town/Stanfilco	3
Tagum	Mankilam/Madaum	AMS/HIJO Twin River	2
Panabo City	Kasilak/AO Floirendo/Prk. 4	DAPCO	3

### 5.2.12 Proposed Improvements of Infrastructure Facilities

#### 1. Completion of Panabo-Carmen Coastal Road

The completion of this road is intended to connect the hard to reach production areas in Carmen to the market hubs of Panabo and Tagum City. This road will serve as the coastal circumferential road that will ease the traffic congestion in Panabo City. It will also give access to the coastal tourism areas in the municipality of Carmen and the city of Panabo.

#### 2. Upgrading of TagumCity By-Pass Road

Tagum City is recognized as one of the most competitive medium-sized component cities in the country and served as the business gateway of the province with its strategic location connecting the four major provinces: Davao Oriental, Compostela Valley, Davao City and Bukidnon with the road opening through the Municipality of Talaingod.

In order to meet the pressing demands of the city's growth, particularly at the urban areas and business districts where traffic congestion is a major problem, a bypass road is proposed to be opened. This road section is an existing barangay road which traverses from Jct. Agusan-Davao Rd. – Canocotan - San Miguel-Mankilam-Pagsabangan – La Filipina – Magdum, Tagum City, Davao del Norte.

#### 3. Upgrading of Panabo City By-Pass Road

One of the fast growing cities in the region in terms of economic activities, Panabo City is facing major traffic congestion particularly along Km 1476 + 000 to Km 1480 + 000 of the Agusan-Davao Road having the most number of Average Annual Daily Traffic as illustrated in Table 3-62 showing the traffic volume on major arterial roads.

To decongest traffic in the highway, an existing diversion road will be proposed to be upgraded and be used as a bypass road. This is an existing provincial road which traverses from Junction Agusan-Davao Rd. JP Laurel Sec. –Jct. Tagum – Panabo Circum. Rd. Southern Davao Section.

#### 4. Construction of Water Breakers/ Revetments

Recent phenomena accounted to climate change like typhoon Pablo that shatter myriads of lives and properties in Compostela Valley and Davao Oriental, the neighboring provinces of Davao del Norte, has brought about the alarming truth that the “typhoon free” blanket has been breached. Davao del Norte has experienced devastating landslides in the upland and extreme flooding in the lowland. But the most observed scenario is the aftermath of prolonging flood. Construction of water breakers and revetments are among the most sought-after mitigating measures to be taken at the shortest possible time before another occurrence comes.

#### 5. Construction of Fly-Over Projects at Panabo City and Tagum City

A Flyover is a crucial infrastructure that will help develop the local economy by easing traffic flow and lessening travel time within the area. The proposed flyover projects in Tagum City and Panabo City are expected to augment the road network and upgrade infrastructure to accommodate increases in population and impact of agricultural production, which is expected to result to increase vehicle use. It will bear an important solution to transport limited routes in the area which contribute to an increase in economic opportunity.

The flyover would serve incoming and outgoing traffic to and from the locality. Traffic congested area areas are prone to accidents that may result to loss of lives and damage to properties. The projects are aimed to avoid such fatalities, increase mobility thereby eliminating traffic congestion and securing the safety of the riding public.

#### 6. Sea Transport Facilities

Consequent to the proposed Samal Bridge, a wharf is proposed to be constructed along Garinan, Tagum City that will transport both passengers and cargoes to and from IGaCos. Large scale sea transport facilities in the province are engaged only in the exportations. With Cavendish bananas as one of the main export products in the province, government and private institutions should work hand in hand in improving the sea transport facilities in the province.

Being part of the Davao Gulf Area Development Plan, existing sea ports in IGaCoS such as Tagpopongan port and Babak port were among the ports to be rehabilitated to upgrade their serviceability.

Sta. Cruz Wharf and Kaputian Wharf also needs further improvements since IgaCos is on the verge of being a prime tourist destination.

#### 7. Roads leading to Tourism Destination Areas

Existing access roads to tourism destinations will be upgraded to provide ease in transport and optimum serviceability to visitors, tourists, excursionists and investors. It will also open opportunities to other potentials of the respective localities.

### 5.3. DEVELOPMENT ISSUES AND CHALLENGES WITH UNDERLYING CAUSES:

- **Inadequate Flood Control and Drainage.** This was brought about by the absence of an approved Comprehensive Master Plan that will establish the nature of the flood and drainage problems including the strategies to address this concern. At present, the Tagum Libuganon River Basin Master Plan is being prepared by the Department of Environment and Natural Resources.
- **Roads exposed to hazards such as rain induced landslide, liquefaction and earthquake induced landslide.** The occurrence of natural calamities have created damages to some road networks that affect other lifeline facilities and access to basic social services.
- **Inadequate Inter and Intra Road Linkages.** The province has a computed total road density of 1.05 Km/Sq.Km which means that it has barely passed the national road requirement of 1.0 Km/Sq. Km. However, the presence of vast area of forest lands and uneven distribution of roads at the local government unit level results to additional road requirements among municipalities, particularly that of Kapalong and Talaingod which has road densities of 0.36 Km/Sq. Km and 0.44 Km/Sq.Km. respectively. Moreover, local roads leading to major tourism destinations of the province are characterized as gravelroads that need to be upgraded.
- **Traffic Congestion.** One of the serious problems of the road sector which results to increase of travel time, failure of timely delivery of goods and people and loss of valuable time is traffic congestion. Increasing number of traffic volume causes jams on major trunk line roads in the province.
- **Insufficient allocation for road construction, rehabilitation and maintenance activities.** Despite the aid coming from various national programs and Official Development Agency (ODA), funds are still not enough to compensate all the needed infrastructure requirements of the road network in the province.
- **Strengthening of the existing cross-cutting themes in road development process.** There is an absence of gender and development, environmental and wildlife considerations in road planning, design and implementation. So, mainstreaming of these themes is essential to ensure that local transport is equitable, safe and provides access to resources and opportunities required for growth.



- **Lack of Road Safety and administration policies and enforcement.** Presently, there is laxity in the imposition of existing rules and regulations related to road safety and administration in the province.
- **Absence of Public Air Transport Facility in the province.** The current airport site, with a total area of 217 hectares, has exceeded its capacity of two million passengers as reflected in the 2011 and 2013 data of the Civil Aviation Authority of the Philippines (CAAP)-Davao.
- **Substandard Existing Public Sea Transport Facility.** The existing ports have substandard facilities and utilities that need to be upgraded. Large scale private sea transport facilities in the province are engage only in the exportations and new public ports will be constructed to transport goods and travelers.
- **Sea Transport Facilities exposed to storm surge.** Due to extreme weather conditions experienced globally, seaports are prone to storm surge and sea level rise. Sea ports exposed to such risks needs additional features making them storm surge resistant ensuring safety and resilience.

#### **5.4 Goals:**

1. **To enhance inter and intra road connectivity.**
2. **To ensure and sustain resiliency and adaptability of the land and water transport facilities and utilities to climate change and disasters.**

#### **5.5 Objectives:**

1. By 2022, flood prone municipalities / cities have established urban and rural drainage system
2. By 2020, at least 60% of the road network and public utilities and facilities are safe and risk resilient.
3. At the end of the planning period, the province shall be included in the Intra-Island Accessibility and Multi-Modal Transport through the Mindanao Railway Project
4. By 2022, the province shall be included in the Intra-Regional Connectivity of Davao Region through the High Standard Highway Network
5. By 2022, the provincial action plan on gender development for road network and environment will be established.
6. By 2016 , Integration of Environmental Management Plans for local road projects shall be fully implemented
7. To institutionalize eco-engineering processes and designs for wildlife protection and habitat/niche improvement in all infrastructure projects.

8. By the year 2020 policies and rules regarding road and safety should be fully implemented thus reducing vehicular accidents to 60%.
9. By the of 2016, key cities in the province shall be considered as location for alternative airport site in the region.
10. By 2022, existing ports within Davao del Norte shall be upgraded and be fully operational.

#### **5.6 Strategies:**

1. Mainstreaming of latest engineering and DRR-CCA technology, gender and environment issues and concerns in road network development planning, design and implementation
2. Prioritize rehabilitation and maintenance of alternative routes during disaster
3. Strengthen partnership among National, Provincial and Local agencies and other stakeholders for the implementation of CCA and risk resilient infrastructure facilities and regulation of utilities
4. Prioritize the implementation of the major external and internal access routes that link Davao del Norte to adjacent provinces and cities, and core road network projects that support the economic and social development of the province
5. Prioritize connectivity of municipalities identified with existing road gaps
6. Strengthen linkages and partnership among National agencies and other stakeholders for the Mindanao Railway Project
7. Ensure full implementation of road safety policies and regulations.
8. Strengthen linkages and partnerships among National Government Agencies, Public Private Partnerships, ODAs and other stakeholders
9. Implement national and local road planning and design guidelines and ensure that cross-cutting themes such as gender and CCA are considered in the design of local roads, its implementation and monitoring
10. Mainstream Eco-engineering processes and designs to all infrastructure projects.
11. Strengthen inter-agency linkages for the implementation of national/local ordinances/policies in relation to Road Safety and Vehicle Load Weight Regulation
12. Strengthen linkages among National agencies, Public-Private Partnership and other stakeholders for the establishment of sea transport facility.
13. Introduce/Establish wildlife protection measures and infrastructure projects particularly on provision of Wildlife Corridors crossing road sections.

## **5.7 PROGRAMS, PROJECTS AND ACTIVITIES**

### **5.7.1 Infrastructure Development Program**

- Repair/Maintenance of Various Provincial Roads and Bridges
- Various Local Roads and Drainage Development project
- Rural Electrification Project
- Various Gov't. Buildings and Facilities Development Project
- Infrastructure Fund Augmentation Project

#### **A. Road Hazards**

##### **A.1. Inadequate flood control and drainage facilities**

- A.1.1. Formulation of Provincial Comprehensive Drainage Master Plan
- A.1.2. Partial Implementation of Flood Control and Drainage System in conformity to the Master Plan
- A.1.3. Construction/ Improvement of Water Breakers
- A.1.4. Desiltation of Rivers
- A.1.5. Revetment of Dikes

##### **A.2. Roads exposed to hazards; such as rain induced landslide, liquefaction and earthquake induced landslide**

- A.2.1. Mapping out all the high risk Provincial Roads that are vulnerable to different kinds of hazards.
- A.2.2. PHILVOCS to conduct a 'WALK THE FAULT ACTIVITY' to pinpoint the three (3) major faultlines of the Province.
- A.2.3. Integration of DRRM and CCA in various plans, programs and projects specifically on road projects.
- A.2.4. Slope Protection Projects at Kapalong - Talaingod - Valencia, Bukidnon Road.

#### **B. Inadequate Inter and Intra road Linkages**

- B.1. Const. of Samal Bridge
- B.2. Opening of Kapalong, Davao del Norte-Loreto, Agusan del Sur Road.
- B.3. Completion of Kapalong, Davao del Norte-Valencia, Bukidnon Road
- B.4. Completion of Asuncion, Davao del Norte-Laak, Comval Province-Veruela, Agusan del Sur Road
- B.5. Upgrading of Local Roads leading to Tourism Destinations.
- B.6. Opening /Improvement of Local Roads
- B.7. NGAs to Conduct of Study on Mindanao Railway Project
- B.8. Rehabilitation and Improvement of the seven clusters of the Provincial Core Road Network as indicated in the Provincial Road Network Development Plan
- B.9. Repair and Maintenance of provincial core roads and bridges.

#### **C. Traffic Congestion**

- C.1. Construction of Fly-overs (in Tagum City and Panabo City)
- C.2. Construction of Diversion Roads (Impvt. Of Kiotoy, Sta. Cruz-Bunawan) (Panabo-Davao)
- C.3. Completion of Panabo-Carmen Coastal Road

- C.4 Consultation with component cities & municipalities on the imposition of separate lane or slow moving vehicle.
- C.5. Installation of Traffic lights along strategic areas
- C.6. Installation of Road Traffic Signs/Fixtures
- C.7. NGAs to Conduct study of MasterPlan on High Standard Highway Network along Tagum-Davao-General Santos Corridor
- C.8. Upgrading of Tagum City By-pass Road
- C.9. Upgrading of Panabo City By-pass Road

**D. Insufficient Allocation for Road Construction, Rehabilitation and Maintenance activities**

- D.1. Confer with target funding agencies, NGAs, business sector, CSOs and other LGUs

**E. Strengthening of the existing Cross cutting themes in Road Development Process**

- E.1. Capacity Building on: Mainstreaming of Cross cutting themes
- E.2. Conduct assessment on gender responsiveness of road network.
- E.3. Installation of gender responsive road facilities (additional waiting sheds, sidewalks and street lightings).
- E.4. Conduct dialogical process in formulating provincial action plan on Gender and Development for road network and Environment
- E.5. Conduct formulation workshop on Gender and Development for road network and Environment
- E.6. Continuing Capacity Building on Environmental Planning & Management
- E.7. Conduct of workshops on the formulation of policies relative to wildlife corridors on road networks
- E.8. Conduct Feasibility Study on the application of wildlife corridors in all horizontal infrastructure projects.
- E.9. Construction of new roads and other infra that are compliant to eco-engineering designs or obtain a Green Seal of approval
- E.10. Orientation and eco engineering designs for wildlife protection and habitat improvement.
- E.11. Establish ground level wildlife corridors in clusters for roads and highways in flood plains.

**F. Lack of Road Safety and Administration Policies and enforcement**

- F.1. Conduct symposia/fora and inter-agency consultation on road safety and local policies awareness and implementation
- F.2. Conduct consultation with the SP Committee on Public Safety
- F.3. Conduct of Road Inventory & Traffic Count , Road Safety Audit and Black Spot Analysis as needed
- F.4. Inclusion of road safety gadgets budget to the POW of Road Projects.
- F.5. Information dissemination using tri-media and social media through the PIO.
- F.6. Inter-agency consultation (implementation on existing laws)
- F.7. Conduct of Seminars on law enforcers relative to truck overloading
- F.8. Formulate guidelines for lane usage and speed limits.
- F.9. Organize and conduct road safety trainors' training among the PDRRMC Road Safety Management Committee
- F.10. Conduct of trainings and seminars for drivers and mechanics
- F.11. Improvement of pedestrian lanes and pavement markings, Installation of road signage and guardrails
- F.12. Construct pedestrian overpass

**G. Absence of Public Air Transport Facility in the province**

G.1. NGAs to conduct FS on Tagum City and Panabo City as potential alternative airport sites

**H. Substandard Existing Public Sea Transport Facility**

H.1. **Rehabilitation of Existing Public Sea Transport Facilities**

H.2. Rehabilitation of Tagpopongan Port, IGaCoS

H.3. Improvement of Sta. Cruz Wharf, Talikud, IGaCoS

H.4. Improvement of Kaputian Wharf, IGaCoS

**I. Lack of Additional Public Sea Transport**

I.1. NGAs to Conduct of feasibility study for the establishment of ports in Panabo City and Tagum City.

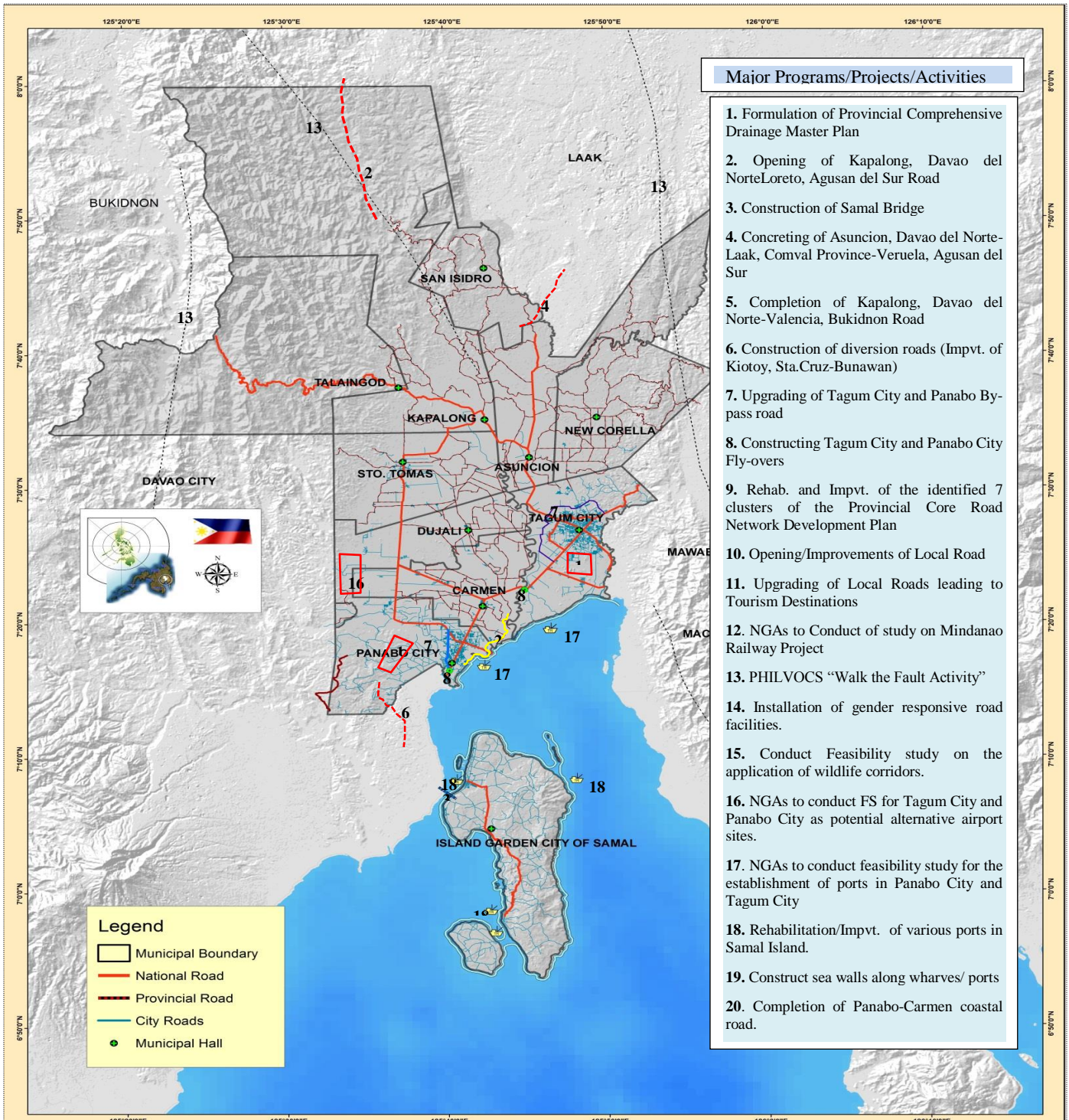
I.2. Conduct of feasibility study for the construction of San Isidro Wharf at Kaputian District, IGaCoS that shall serve as alternative entry point to Talikud Island

**J. Sea Transport Facilities exposed to Storm Surge**

J.1. Construct sea walls along wharfs/ports



**Map 45. Transport and Access Sector Map**



Map Source: PROVINCIAL PLANNING AND DEVELOPMENT OFFICE

**PROPOSED TRANSPORT AND ACCESS SECTOR MAJOR PPA'S MAP**

Coordinate System: WGS 1984 UTM Zone 51N  
 Projection: Transverse Mercator  
 Datum: WGS 1984  
 False Easting: 500,000.0000  
 False Northing: 0.0000  
 Central Meridian: 123.0000  
 Scale Factor: 0.9996  
 Latitude Of Origin: 0.0000  
 Units: Meter



REPUBLIC OF THE PHILIPPINES  
 PROVINCE OF DAVAO DEL NORTE  
 REGION XI



This map is indicative and is intended for Provincial level Risk Assessment. For Municipality and site level hazard microzonation, further consultation to mandated government agencies is recommended.

## 6.0 EMPLOYMENT, INCOME, SERVICE ACCESS AND POVERTY

Disasters are influenced by climate change. The occurrence of these affects the lives of people in many ways. Among others it transforms employment opportunities and incomes. It also results in greater unsteadiness in weather conditions and natural disasters such as floods and heat waves that can cause crop failure and reduced income.

Davao del Norte as an agricultural province is not spared from this phenomenon. Jobs and livelihood of many are at risk because of the high reliance on income from agricultural activities.

For these reasons, the ability to access the limited goods and services may even be greatly affected to the point that basic needs are not met and will result to poverty. Poverty, in turn, affects the quality of productions and eventually economic development. This chapter therefore presents the symptoms of growth particularly on the social dimension of development of the province

### 6.1 Employment

Table No. 3-127 shows that in 2013, the labor force of the province totaled 404,991 or 65 percent, 15 years old and above consisted 624,410 of its population. Out of this, 93 percent or 376,136 were gainfully employed and 7 percent or 28,855 were reported unemployed. On the other hand, 219,419 or 35 percent were not in the labor force. This is a projection made on the available latest data published by the Philippine Statistical Agency (October, 2013 Report).

Table No. 3-127: Labor Force

#### Province of Davao del Norte, 2013

	MALE	%	FEMALE	%	TOTAL	%
15 yrs. old & above	319,888	51%	304,522	49%	624,410	
In the labor force	259,429	81.1%	145,562	47.8%	404,991	65%
Employed	243,604	93.9%	134,354	92.3%	376,136	93%
Unemployed	15,825	6.1%	11,208	7.7%	28,855	7%
Not in the labor force	60,459	28%	158,960	72%	219,419	35%

Source: Philippine Statistical Agency

It is also reported that for every 100 population in productive age there are 53 dependents. Of which there are 51 dependents which belong to the young age and 2 dependents from the old age group.

With the interventions of the Public Employment Services Office (PESO) of Davao del Norte, a total of 25,601 were given employment in 2014 (Table No. 3-128)

**Table No. 3-128: Employment Generation by the PESO  
Davao del Norte, 2014**

Particular	Number
Job Vacancies	104,533
Applicants Registered	44,159
Applicants Referred	33,299
Applicants Placed	25,601
Jobs Fair Conducted	31
Applicants Registered	7,271
Applicants Hired on the Spot	1,078

Source: PESO, Davao del Norte

Based on Philippine Statistical Agency (PSA) of October 2013 report, Davao del Norte's employment rate of 93 per cent is more or less the same with the regional scenario of 93 per cent and slightly higher than the national figure of 92.7 per cent. While the unemployment rate of the province and of the region is the same at 7 percent, this is a bit less than the unemployment rate of the national figure of 7.3%. (Table No. 3-129).

**Table No. 3-129 : Employment Status, 2013  
Provincial/Regional/National**

Particular	Davao del Norte	Region XI	National
Labor force participation rate (%)	65	64	63.9
Employment rate (%)	93	93	92.7
Unemployment rate (%)	7	7	7.3

Source: PSA, October 2013 Labor Force Survey

While statistics suggests a good performance in employment generation, there remains a major concern on unemployment in Davao del Norte. Availability for job opportunities can be another concern which must be looked into. Job mismatch is still an issue being raised by some stakeholders.

## **6.2 Family Income**

Citing the National Economic Development Authority in Region XI report, the information on average family income of Davao del Norte is the same with Davao Region's data. In 2009, the average family income was estimated at P166,000 or P13,833.33 monthly. This figure is very much lower than the national figure of P206,000.

The source of income is mostly derived from wages and salaries which is 50.1%; entrepreneurial activities at 27.9% and from other sources at 24.7%. Low income is a major concern of the populace of the province.

Family Income being the basic determinant factor in gauging the living condition of the populace should therefore be considered in addressing the economic and other development of the province.

## **6.3 Social Services**

### **6.3.1 Health**

#### **a. Facilities**

There are twenty-five (25) hospitals in Davao del Norte, four of which are government owned and operated such as the Davao Regional Hospital, a DOH tertiary hospital located in Tagum City and the three (3) provincial hospitals located in the municipalities of Kapalong, Carmen and in the Island Garden City of Samal. There are other twenty-two (22) private hospital facilities mostly located in the component cities and first class municipalities.

In the implementation of Inter-Local Health System, the Davao Regional Hospital serves as the core referral hospital for cluster 1. The cluster has a total population of 327,849 with total hospital beds of 650 and having a ratio of 1:481. The data shows that it has more than compliance of DOH standard of 1:1,000. The implication is that they can cater additional number of patients.

On the other hand, Davao del Norte Hospital - Kapalong Zone, serves as the core referral hospital of patients and clients from Health Development Cluster II, with its cluster member compose of the Municipality of San Isidro, Kapalong, Asuncion and Talaingod. This Health Development Cluster has a total population of 189,343 with 67 available bed capacity.

The municipalities of Braulio E. Dujali, Sto. Tomas, Carmen and the City of Panabo served as the Cluster III, they are catered by the Carmen District Zone, a 43-bed capacity and with occupancy rate of 77%. Due to the inadequacy of health manpower as well as health facilities, patients with major ailments are brought to the private hospitals in Panabo City and even to Tagum and Davao City.



Samal District Hospital on the other hand, is a primary and a 25 bed capacity hospital. It caters the entire City covering 46 barangays and a total population of 101,704. It has an occupancy rate of 98%. Major ailments are usually referred to Davao City for further treatment.

Considering all public and private hospitals, there are a total of 1,143 authorized hospital beds in the province. Taking into account the 1,044,199 population, a hospital bed ratio to population is computed at 1:914 which is higher than the national standard of 1:1,000. However, when we look at per cluster, the cluster 2, 3 and 4 fell short of hospital beds. This indicates of a need for additional hospital beds to increase its authorized bed capacity and meet the need of respective cluster especially in times of disasters where victims are being attended to Table No. 3-130.

*Table No. 3-130 : Hospital Population Ratio  
by Health Development Cluster  
Davao del Norte, 2014*

City/ Municipality	No. of Hospitals		Total No. of Hospitals	(ABC) Bed Capa city	Hospital Bed Ratio by City/ Mun	Total Population per Cluster	Standard 1:1,000	Population 2014
	Gov't.	Private						
<b>Cluster I</b>								
Tagum City	1	4	5	650	1:481	327,849	1:504	274,524
New Corella	0	0	0	0				53,325
<b>Total</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>650</b>				<b>372,849</b>
<b>Cluster II</b>								
San Isidro	0	0	0	0		189,343	1:2,826	26,098
Kapalong	1	2	3	67	1:1,087			72,854
Asuncion	0	0	0	0				59,871
Talaingod	0	0	0	0				30,520
<b>Total</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>67</b>				
<b>Cluster III</b>								
B.E. Dujali	0	0	0	0		425,303	1:1,110	34,097
Carmen	1	1	2	43	1:763			75,837
Panabo City	0	8	8	272	1:713			194,031
Sto. Tomas	0	5	5	68	1:1,784			121,338
<b>Total</b>	<b>1</b>	<b>14</b>	<b>15</b>	<b>383</b>				
<b>Cluster IV</b>								
IGaCos						101,704	1:2,365	
Babak	1	0	1	18	1:2,352			42,351
Samal	0	1	1	25	1:1,154			28,944
Kaputian	0	0	0	0				30,409
<b>Total</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>43</b>				
<b>Over-all Total</b>	<b>21</b>	<b>4</b>	<b>25</b>	<b>1,143</b>	<b>1:913</b>	<b>1,044,199</b>	<b>1:914</b>	<b>1,044,199</b>

Source: PHO, Davao del Norte



In 2012, NSCB reported that in Region XI, Davao del Norte ranks second in the number of hospitals with the most number of authorized beds. In terms of its ratio of hospital bed to population, Davao del Norte also ranks third Table No. 3-131.

**Table No. 3-131: Hospital Bed Capacity and Bed Population Ratio, 2012**  
By Province/ City  
Region XI

Province / City	Number of Hospital			Authorized Beds			Ratio to Population
	Gov't	Private	Total	Gov't.	Private	Total	
Compostela Valley	4	10	14	70	166	236	1:2,701
Davao del Norte	4	21	25	275	840	1,119	1:879
Davao Oriental	5	4	9	160	93	253	1:1,921
Davao del Sur	7	36	43	190	919	1,109	1:742
Davao City	4	25	29	435	1,160	1,595	1:855
Davao Region	24	94	118	1,130	3,178	4,308	1:965

Source: NSCB Report

In other municipalities where hospitals are not available, health care services are augmented by the 14 Health Centers and 189 Barangay Health Stations where a total of 1,991 Barangay Health Workers (BHW) are assisting in delivering basic health services. Table No. 3-132.

**Table No. 3-132 : Main Health Centers, Barangay Health Stations  
and Brgy. Health Workers**  
Davao del Norte, CY 2014

AREA	Health Centers		Barangay Health Stations	
	No. of Health Center	Number of Barangays	Number of Brgy. Health Stations	Number of Brgy. Health Workers
Asuncion	1	20	13	240
Kapalong	1	14	13	124
New Corella	1	20	20	170
San Isidro	1	13	10	138
Tagum City	1	23	23	200
Talaingod	1	3	3	66
Carmen	1	20	13	158
B. E. Dujali	1	5	2	66
Panabo City	1	40	35	259
Sto. Tomas	1	19	16	159
IGaCos	4	46	41	411
<b>Province</b>	<b>14</b>	<b>223</b>	<b>189</b>	<b>1,991</b>

Source: PHO, Davao del Norte

Health facilities in the province still need upgrading and improvement. Additional medical equipment and facilities are necessary to advance the afforded health services to the community.

**b. Health facilities exposed to calamities**

It is a common knowledge that as calamities disrupts services the difficulty in providing care for patients also increases. Hence, it is important to identify the health facilities that need upgrading and improvement.

**Health Facilities Exposed to Liquefaction**

In Davao del Norte, there are 39 health facilities exposed to liquefaction. Of the six LGUs affected, Tagum City has 23 facilities exposed to liquefaction, the Davao Regional Hospital, 3 of its private hospitals, 15 of its health centers and 4 of its Botika ng Barangay are highly susceptible to liquefaction. Panabo City also has 6 health facilities which are highly and moderately exposed to liquefaction. Table No. 3-133.

*Table No. 3-133 : Health Facilities Exposed to Liquefaction  
Davao del Norte, CY 2014*

City/ Municipality	Health Facility	No. Exposed	Haz Code
Carmen	Hospital	2	HSA
	Medical Clinic	1	HSA
Kapalong	Public Hospital	1	HSA
Panabo	Medical Clinic/center	2	HSA
	Medical Clinic	1	MSA
	Hospital	3	MSA
Sto. Tomas	Medical Clinic/Hospital	4	HSA
Tagum	Public Hospital	1	HSA
	Private Hospital	3	HSA
	Health Centers	15	HSA
	Botika ng barangay	4	HSA
Talaingod	Medical clinic	2	LSA
		<b>39</b>	

**Health Facilities Exposed to Ground Shaking**

A total of 41 health facilities are prone to ground shaking. These include the seven (7) cities/municipalities Davao del Norte (Carmen, IGACOS, Kapalong, Panabo, Sto. Tomas, Tagum and Talaingod). The Davao hospitals (Carmen, Samal, and Kapalong district hospitals) are particularly identified with PHIVOLCS Earthquake Intensity Scale (PEIS) VII and PEIS VIII and above. Meanwhile, Tagum City has the most number of facilities exposed to ground shaking with 23 health facilities all are exposed to PEIS VIII and above and Panabo City with 6 health facilities exposed to PEIS VII. Noteworthy to mention that most of the facilities exposed to ground shaking are the same facilities exposed to liquefaction.

*Table No. 3-134* : **Health Facilities Exposed to Ground Shaking**  
Davao del Norte, CY 2014

City/ Municipality	Facility	No. of Facilities Exposed	Haz Code
Carmen	Hospital	2	PEIS VII
	Medical Clinic	1	PEIS VII
IGACOS	Hospital	2	PEIS VII
Kapalong	Hospital	1	PEIS VIII and above
Panabo	Medical Clinic	3	PEIS VII
	Hospital	3	PEIS VII
Sto. Tomas	Medical Clinic/Hospital	4	PEIS VII
Tagum	Barangay Health Center	15	PEIS VIII and above
	Hospital	4	PEIS VIII and above
	Botika ng barangay	4	PEIS VIII and above
Talaingod	Medical Clinic	2	PEIS VII
		41	

#### **Health Facilities Exposed to Earthquake Induced Landslide**

The province has 5 identified health facilities susceptible to earthquake induced landslide, 2 are from New Corella, 2 Kapalong and 1 from San Isidro. All are highly susceptible to earthquake induced landslide. Table No. 3-135.

*Table No. 3-135* : **Health Facilities Exposed to Earthquake Induced Landslide**  
Davao del Norte, CY 2014

City/ Municipality	Facility	No. Exposed	Haz Code
New Corella	Botika ng Barangay	1	HSA
	Health Center	1	HSA
Kapalong	Botika ng Barangay	1	HSA
	Health Center	1	HSA
San Isidro	Health Center	1	HSA
		5	

#### **Health facilities exposed to Rain Induced Landslide (for revision)**

There are 5 health facilities exposed to rain induced landslide, 3 from New Corella two (2) from Kapalong and one (1) from San Isidro. All are highly susceptible to earthquake induced landslide.

### Health Facilities Exposed to Flood

The province has about sixteen (16) health facilities exposed to flooding. These include the district hospitals in Carmen and Kapalong with medium susceptibility area (MSA) and high susceptibility area (HSA) to flood, respectively. Panabo City has the most number exposed to flooding with 6 health facilities ranging from low susceptibility (LSA) to medium susceptibility (MSA). There are 4 health facilities in Sto. Tomas which are affected with flooding, ranging from the lowest scale to highest scale. Other LGUs with some medical clinics and hospitals are also identified as flood prone. Table No. 3-136.

**Table No. 3-136 : Health Facilities Exposed to Flood**  
Davao del Norte, CY 2014

City/ Municipality	Health Facility	No. Exposed	Haz Code
Carmen	District Hospital	1	MSA
	Medical Clinic	1	LSA
	Hospital	1	LSA
Kapalong	District Hospital	1	HSA
Panabo	Medical Clinic	2	LSA
	Medical Clinic	2	MSA
	Hospital	1	MSA
	Hospital	1	LSA
Sto. Tomas	Medical Clinic/Hospital	2	LSA
	Medical Clinic	2	MSA
Tagum	Health Center	2	HSA
		<b>16</b>	

### Health Facilities Exposed to Storm Surge

Table No. 3-137 reveals that there are nine (9) health facilities in four coastal cities/municipalities of Davao del Norte that are exposed to storm surge. The municipality of Carmen and three (3) cities (Island Garden City of Samal, Panabo City and Tagum City) are situated along the coastal area of the province hence are the LGUs with high probability to be affected by coastal flood or tsunami-like phenomenon of rising water commonly associated with low pressure weather systems. The facilities which are at greater risk to storm surge are found in IGACOS, Panabo City and Tagum City with exposure ranging from 2 to 3.

**Table No. 3-137 : Health Facilities Exposed to Storm Surge**  
Davao del Norte, CY 2014

City/ Municipality	Health Facility	No. of facilities exposed	Var
Carmen	Hospital	1	2
IGACOS	Hospital	2	3
Panabo	Hospital	2	2

	Hospital	1	2
Tagum	Health center	2	2
	Health center/botika ng barangay	1	3
		<b>9</b>	

There is a need to assess, protect and strengthen these identified health facilities to prepare and meet the required lifelines of the populace especially in times of disasters. The role of the local government units in Davao del Norte is significant in the enforcement of policies and implementation of programs, projects and activities for safer environment and better disaster risk management.

### b. Health Manpower

Considering the projected population of 1,044,199 in 2014, the doctor to population ratio is placed at 1:41,767. This is relatively higher by 109% or greater in number by 21,767 than the National Standards. Only the number of midwives is within the standard set by the national government. (See Table No. 3-138).

*Table No. 3-138 : Doctor- Population Ratio*  
Davao del Norte CY 2014

Category	Number	Ratio to Proportion	Average No. of Physician to meet the Standard (DOH target)	National Standard Ratio
Physician	23	1:41,767	57	1:20,000
Nurses	40	1:26,105	57	1:20,000
Dentists	15	1:69,613	53	1:20,000
Midwives	161	1:6,485	214	1:1,000
Medical Technologists	17	1:61,423	53	1:20,000
Sanitary Inspectors	13	1:80,323	53	1:20,000

*Source: PHO, Davao del Norte*

The same scenario in the other areas of the Region has been observed regarding the health manpower ratio to population. There is a need for additional health personnel. Table No. 3-139.



**Table No. 3-139 : Number of Selected Field Health Manpower & Ratio to Population  
By Province/ City  
Region XI, 2013**

MAN-POWER	PROVINCE / CITY										DOH STANDARD RATIO
	Davao del Norte		Compostela Valley		Davao Oriental		Davao del Sur		Davao City		
	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	No.	Ratio	
Doctors	19	1:53,672	15	1:48,300	12	1:45,178	18	1:50,311	16	1:97,425	1:59,385
Dentists	10	1:101,976	10	1:72,450	10	1:54,214	11	1:82,327	14	1:111,343	1:86,378
Nurses	24	1:42,490	19	1:38,131	18	1:30,119	32	1:28,300	84	1:18,557	1:26,841
Midwives	154	1:6,622	172	1:4,212	177	1:3,063	160	1:5,660	89	1:17,515	1:6,318
Nutritionist	8	1:127,470	1	1:724,495	3	1:180,712	3	1:301,865	18	1:86,600	1:143,963
Medical Technologists	16	1:63,735	15	1:48,300	11	1:49,285	11	1:82,327	16	1:97,425	1:68,852
Sanitary Engineer	0		0		0		0		0		0
Sanitary Inspector	17	1:59,986	15	1:48,300	14	1:38,724	21	1:43,124	14	1:111,343	1:58,652
Dental Aide	12	1:84,980	10	1:72,450	12	1:45,178	15	1:60,373	16	1:97,425	1:73,089
Barangay Health Workers	2,376	1:429	2,147	1:337	2,676	1:203	3,184	1:284	1,036	1:1,505	1:416

Source: Provincial Health Office, Davao del Norte

**c. Other Health Indicator**

Table No. 3-140 are the health indicators produced by the Provincial Health Office of Davao del Norte for the year 2014. These are computed based on the projected population of 1,044,200. Other vital health indices are as follows:

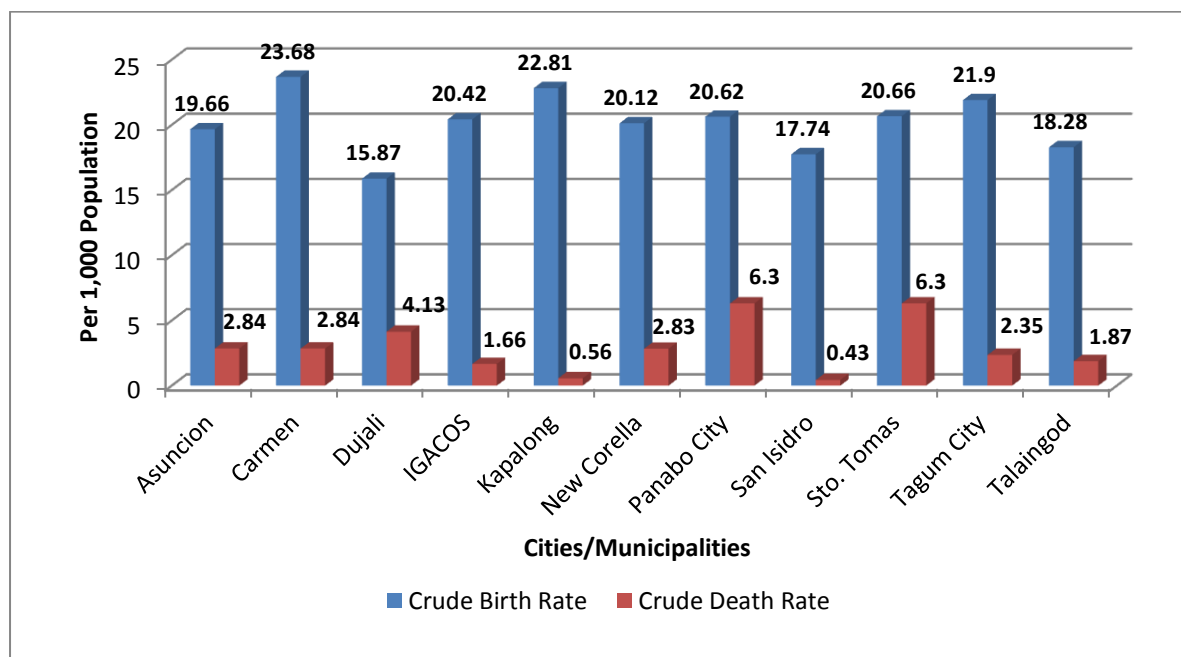
Table No. 3-140 : Vital Health Indices  
Davao del Norte, 2014

Projected Population	1,044,200
Live Births	21,867
Crude Birth Rate	20.94
Number of Deaths	3,219
Crude Death Rate	3.08
Maternal Deaths	33
Maternal Mortality Rate	150.91
Infant Deaths	410
Infant Mortality Rate	18.75
Under 5 deaths	508
Under 5 Mortality Rate	23.23
Perinatal Deaths (Rate/100,000)	471.02
Neonatal Deaths (Rate/100,000)	567.06
Fetal Deaths (Rate/100,000)	64.02

Source: Provincial Health Office, Davao del Norte

The Crude Birth Rate (CBR) and Crude Death Rate (CDR) in the cities and municipalities of Davao del Norte are presented in Figure No. 20. These are both measured by the rate of births or deaths respectively among a population of 1,000. In 2014, the municipality of Carmen has the highest CBR with 23.68 while Panabo City has the highest CDR with 6.3.

**Figure No. 20 : Crude Birth Rate & Crude Death Rate**  
Per 1,000 Populations By Cities/Municipalities  
Davao del Norte, CY 2014



Source: Provincial Health Office, Davao del Norte

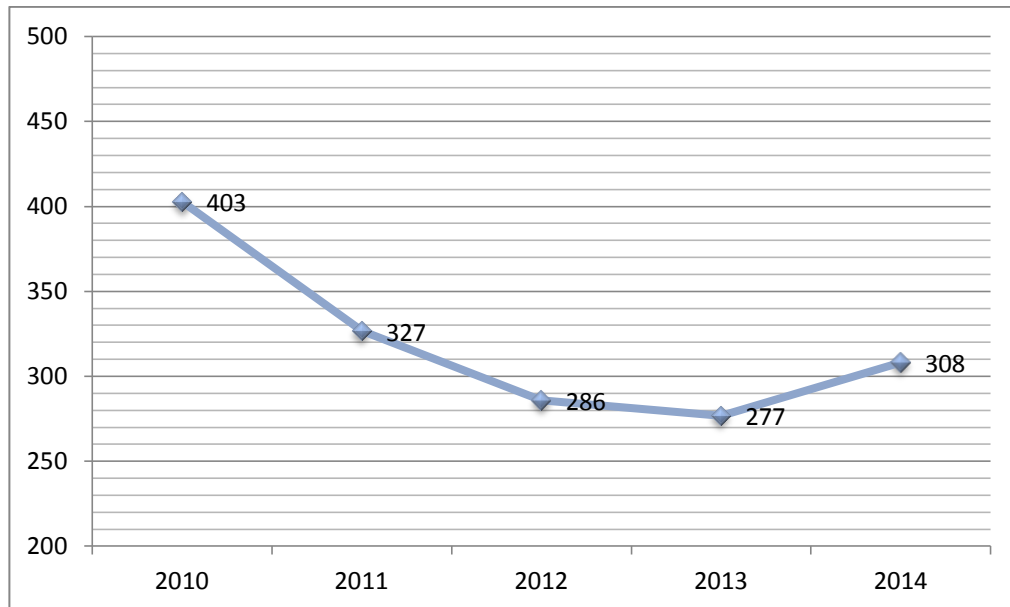
**Table No. 3-141 : Crude Birth Rate & Crude Death Rate**  
Per 1,000 Populations By Cities/Municipalities  
Davao del Norte, CY 2014

City/Municipality	Crude Birth		Crude Death	
	Live births	Rate	Mortality Cases	Rate
Asuncion	1177	19.66	26	2.84
Carmen	1796	23.68	313	2.84
Dujali	541	15.87	97	4.13
IGACOS	2077	20.42	169	1.66
Kapalong	1662	22.81	41	0.56
New Corella	1073	20.12	151	2.83
Panabo City	4002	20.62	1222	6.30
San Isidro	463	17.74	74	0.43
Sto. Tomas	2507	20.66	424	6.30
Tagum City	6011	21.90	645	2.35
Talaingod	558	18.28	57	1.87

Source: Provincial Health Office, Davao del Norte

Mortality rate for the last four (4) years has been decreasing from 403 per 100,000 population in 2010 to 277 in 2013 but had an increase of 308 in 2014. (Figure No. 21).

**Figure No. 21 : Mortality Rate**  
Per 100,000 Population  
Davao del Norte 2010-2014



Source: Provincial Health Office, Davao del Norte

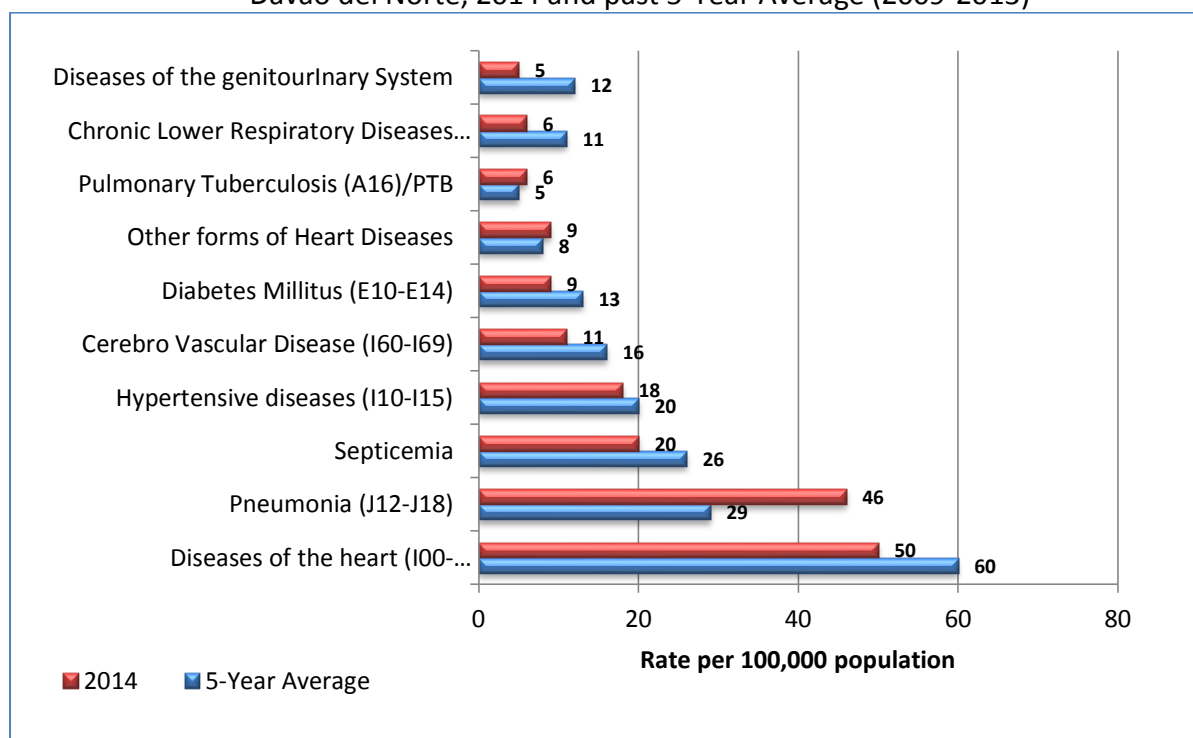
**Table No. 3-142: Mortality Rate**  
Per 100,000 Population  
Davao del Norte 2010-2014

Year	Number of Deaths	Mortality Rate per 100,000 Population
2010	3495	403
2011	3155	327
2012	2815	286
2013	2821	277
2014	3219	308

Source: Provincial Health Office, Davao del Norte

In Davao del Norte, the top most leading causes of death include heart diseases, pneumonia, septicemia, hypertensive diseases and cerebro vascular diseases. It can be noted that the rate of 46 of pneumonia cases in 2014 has exceeded the 5-year average rate of 29. Most of the common causes are closely related to lifestyles of the populace. (Figure No. 22).

**Figure No. 22: Mortality Leading Causes (All ages)**  
Rate per 100,000 populations  
Davao del Norte, 2014 and past 5-Year Average (2009-2013)



Source: Provincial Health Office, Davao del Norte

**Table No. 3-143 : Mortality Leading Causes (All ages)**  
Rate per 100,000 populations  
Davao del Norte, 2014 and past 5-Year Average (2009-2013)

Causes	2014		5-Year Average	
	Number	Rate	Number	Rate
1. Diseases of the heart	524	50	575	60
2. Pneumonia	478	46	280	29
3. Septicemia	212	20	251	26
4. Hypertensive Disease	193	18	192	20
5. Cerebro Vascular Disease	119	11	154	16
6. Diabetes Millitus	95	9	126	13
7. Other forms of Heart Diseases	93	9	78	8
8. Pulmonary Tuberculosis	68	6	52	5
9. Chronic Lower Respiratory Diseases	66	6	110	11
10. Diseases of the Genitourinary Systems	58	5	118	12

Source: Provincial Health Office, Davao del Norte



Considering other provinces in the region, diseases of the heart, pneumonia and malignant neoplasm are the three top most leading causes of mortality. Davao del Norte is next to Davao City with cases related to heart diseases. (Table No. 3-144).

**Table No. 3-144 : Mortality, Leading Causes Number and Rate**  
Per 100,000 Population  
Region XI, 2013

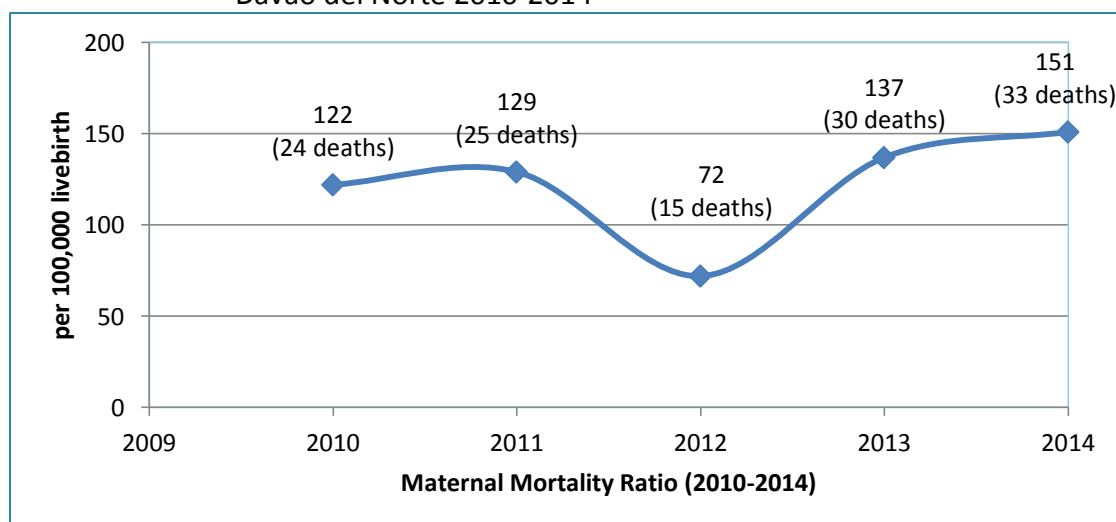
Causes	Davao del Norte		COMVAL		Davao Oriental		Davao Sur		Davao City	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
1. Diseases of the heart	608	60	72	10	112	21	288	32	1,100	71
2. Pneumonia	382	37	56	7	259	48	230	25	1,302	84
3. Malignant neoplasm, all forms	225	22	83	11	-	-	102	11	795	51
4. Hypertensive diseases	210	21	134	18	102	19	224	25		
5. Diseases of the Genitourinary System	147	14	-	-	22	4	60	7	495	32
6. Cerebrovascular disease	133	13	47	6	73	13	-	-	1,201	77
7. Diabetes Mellitus	132	13	51	7	59	11	-	-	484	31
8. Chronic Lower Respiratory Disease	118	12	-	-	32	6	22	2	-	-
9. Septicemia	96	9	-	-	40	7	28	3	230	15
10. Tuberculosis	89	9	41	5	83	15	50	6	262	17
11. Accident, all forms	-	-	61	8	-	-	51	6	-	-
12. Assault	-	-	7	1	-	-	-	-	-	-
13. Diseases of the Digestive System	-	-	41	5	35	6	23	3	246	16
14. Diseases of arteries. Aterriols & capillaries	-	-	-	-	-	-	-	-	906	58

Source: DOH XI – RHIS & Special Report

Maternal mortality measures death among women during pregnancy, childbirth and postpartum. In the past five (5) years (2010-2014), Davao del Norte shows an erratic trend of maternal mortality. There is a decrease of maternal death from 24 deaths in 2010 to 15 deaths in 2012 but experienced an increase in succeeding years despite the Millenium Development Goal's effort to reduce cases. In 2014, there are thirty-three (33) maternal deaths in the province. (Figure No. 23 & Table No. 3-145).

In the span of five years, most maternal deaths occur in the LGUs of Tagum City, Panabo City, Carmen and Sto. Tomas. However, in 2014 the municipality of Asuncion has a drastic change having reported 4 maternal deaths. The municipality of New Coreolla and San Isidro have zero maternal deaths. Maternal deaths mostly occur from the third to the 1<sup>st</sup> week after birth and are due to delivery complications

Figure No. 23 : **Maternal Mortality Ratio**  
Per 100,000 Livebirth  
Davao del Norte 2010-2014



Source: Provincial Health Office, Davao del Norte

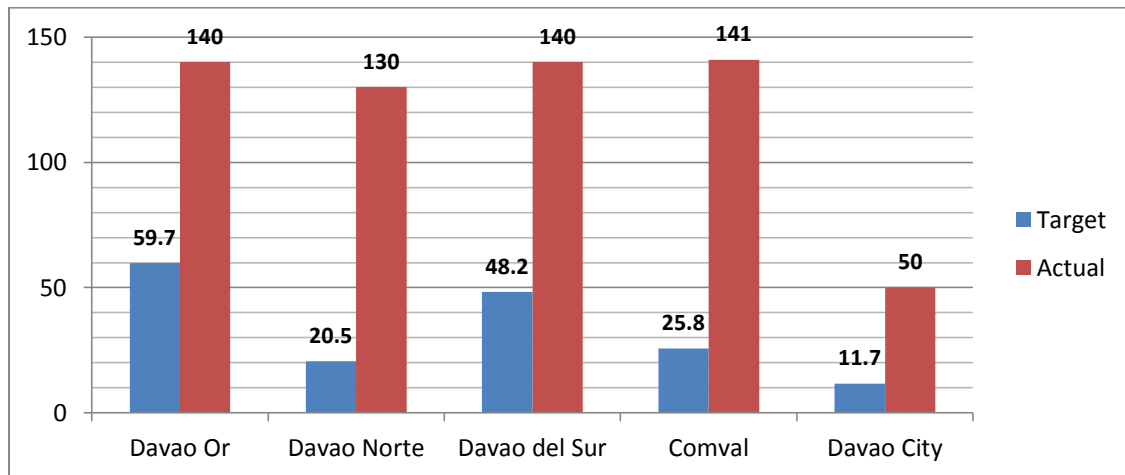
Table No. 3-145 : **Maternal Mortality Ratio**  
Per 100,000 Livebirth  
Davao del Norte 2010-2014

City/ Municipality	2010		2011		2012		2013		2014	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Asuncion	1	5.06	3	15.43	1	4.80	1	4.56	5	22.87
Carmen	0	-	1	5.14	1	4.80	2	9.11	5	22.87
Dujali	0	-	0	-	0	-	1	4.56	1	4.57
IGACOS	0	-	5	25.72	1	4.80	1	4.56	1	4.57
Kapalong	1	5.06	2	10.29	1	4.80	3	13.67	1	4.57
New Coreolla	2	10.12	1	5.14	1	4.80	3	13.67	-	-
Panabo City	3	15.19	5	25.72	3	14.39	7	31.89	8	36.58
San Isidro	2	10.12	1	5.14	1	4.80	2	9.11	-	-
Sto. Tomas	9	45.56	3	15.43	0	-	3	13.67	4	18.29
Tagum City	6	30.37	3	15.43	4	19.19	4	18.22	6	27.44
Talaingod	0	-	1	5.14	2	9.59	3	13.67	2	9.15
	24		25		15		30		33	

Source: Provincial Health Office, Davao del Norte

In Davao Region, among the provinces and cities, Davao del Norte has the lowest reported cases of maternal death. Figure No. 24.

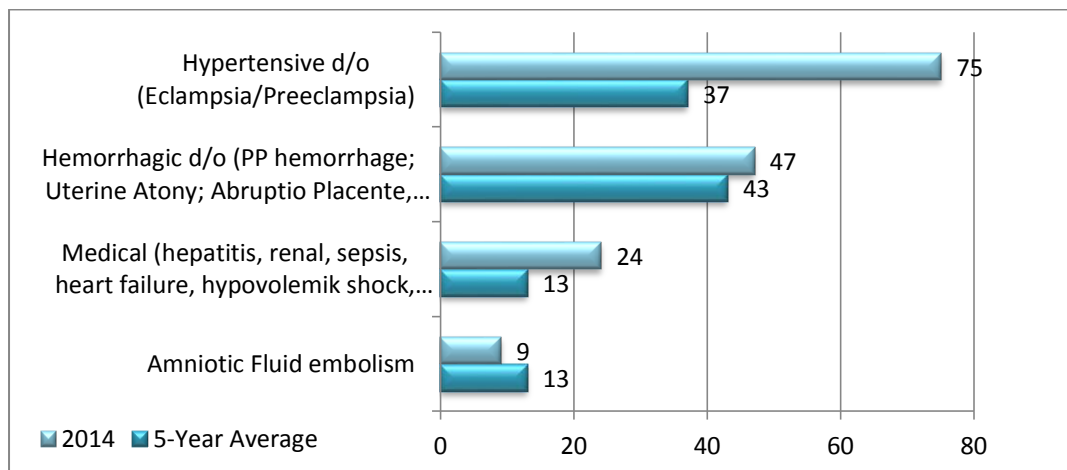
**Figure No. 24: Maternal Mortality Ratio**  
2011 MDG Targets Davao Region by City/Province



Source: Department of Health

Figure No. 24 shows the leading causes of maternal mortality in the province. These are complications of labor and delivery which includes hypertensive, postpartum hemorrhage, medical related and amniotic fluid embolism. Hypertensive which includes eclampsia and/or preeclampsia is lifestyle case related. It has also the highest rate in Davao del Norte with 16 cases. To reduce or avoid the occurrence of this, there is a need to upgrade the delivery system of essential health care package for pregnant women both in barangay health stations and hospitals of the province.

**Figure No. 25 : Maternal Mortality Leading Causes**  
Rate per 100,000 Livebirths  
Davao del Norte, 2014 and past 5-year Average (2009-2013)



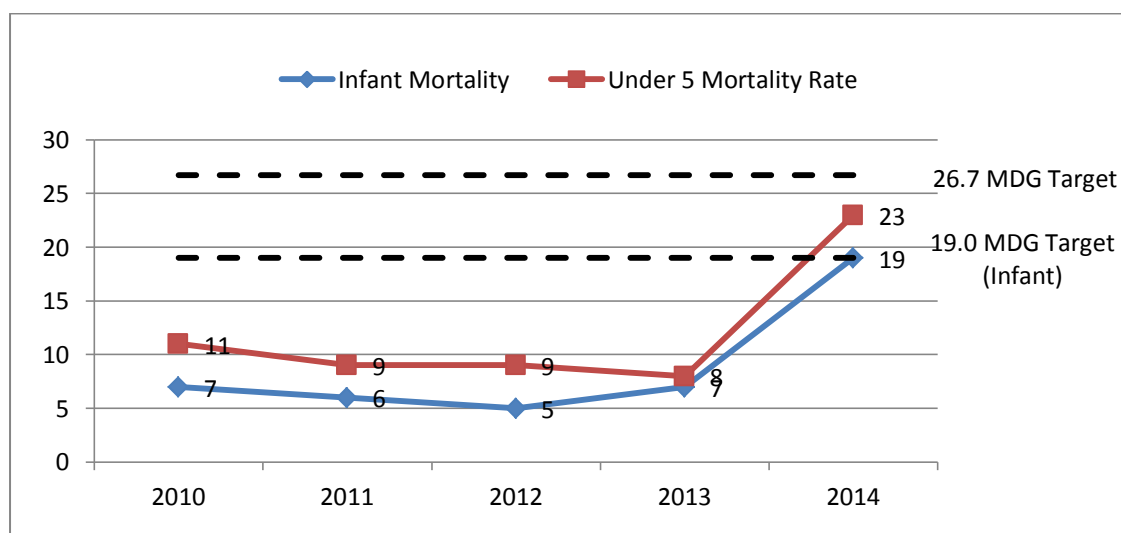
**Table No. 3-146 : Maternal Mortality Leading Causes**  
Rate per 100,000 Livebirths  
Davao del Norte, 2014 and past 5-year Average (2009-2013)

Causes	2014		5-Year Average	
	Number	Rate	Number	Rate
1. Hypertensive (Eclampsia/Pre eclampsia)	16	75	7	37
2. Hemorrhagic (Hemorrhage; Uterine Atony; Abruptio Placenta; Placenta Previa)	10	47	9	43
3. Medical (hepatitis, renal, sepsis, heart failure, hypovolemik shock, etc)	5	24	3	13
4. Amniotic Fluid Embolism	2	9	3	13

Source: Provincial Health Office, Davao del Norte

As illustrated in Figure No. 26, from 2012-2013 infant and child mortality and under 5 mortality rate in the province show a decreasing rate in 2010 to 2012 but experienced an abrupt increase in 2013 to 2014. In 2014, the infant mortality rate (IMR) is 19 per 1,000 livebirths while the under-five mortality (UFMR) is 23 per 1,000 live births. Both were higher compared to the rates of the previous years. Table No. 3-147.

**Figure No. 26 : Infant and Under-5 Mortality Rates**  
Per 1,000 Livebirths  
Davao del Norte, CY 2010-2014



Source: Provincial Health Office, Davao del Norte

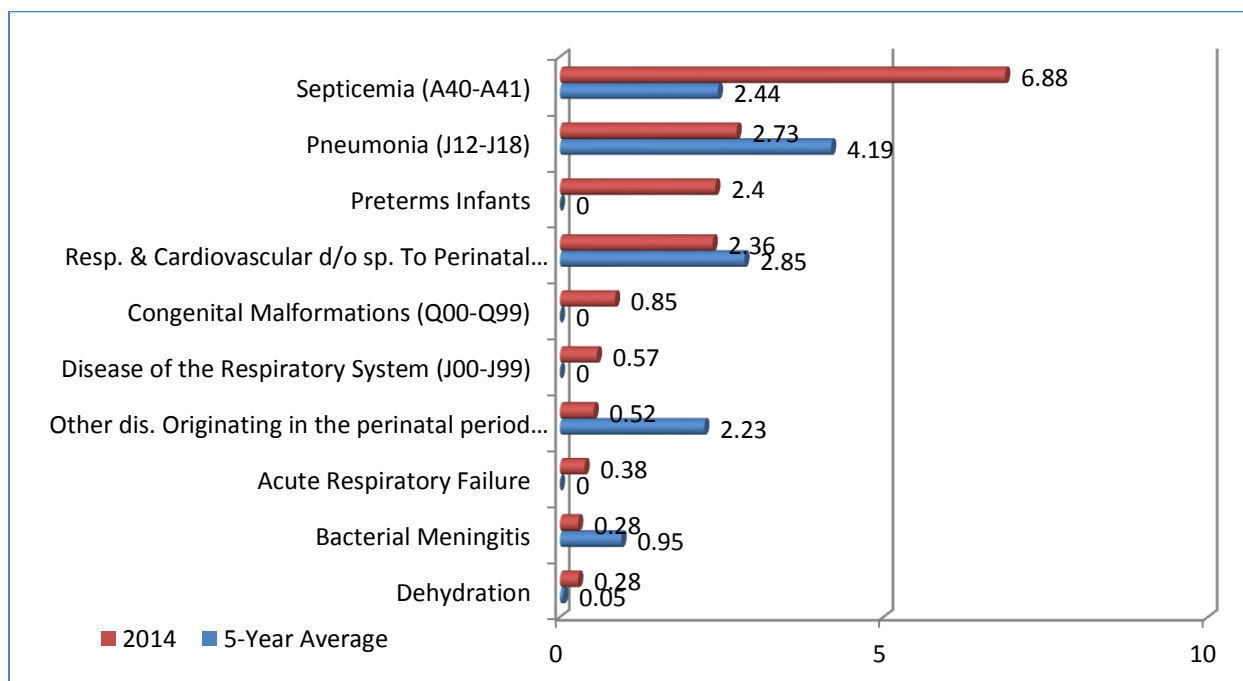
Table No. 3-147 : **Infant and Under-5 Mortality Rates**  
Per 1,000 Livebirths  
Davao del Norte, CY 2010-2014

	Infant Mortality Rate		Under-5 Mortality Rate	
	Number	Rate	Number	Rate
<b>2010</b>	143	7.20	220	11.00
<b>2011</b>	120	6.07	175	9.00
<b>2012</b>	105	5.03	189	9.00
<b>2013</b>	143	6.50	780	8.20
<b>2014</b>	410	18.75	508	23.23

Source: Provincial Health Office, Davao del Norte

The top three (3) leading causes of infant death in the province are septicemia, pneumonia and pre maturity. Figure No. 27 and Table No. 3-148.

Figure No. 27 : **Infant Mortality Leading Causes**  
Rate per 100,000 Livebirth  
Davao del Norte, 2014 and past 5-year Average (2009-2013)



Source: Provincial Health Office, Davao del Norte



**Table No. 3-148 : Infant Mortality Leading Causes**

Rate per 100,000 Livebirth

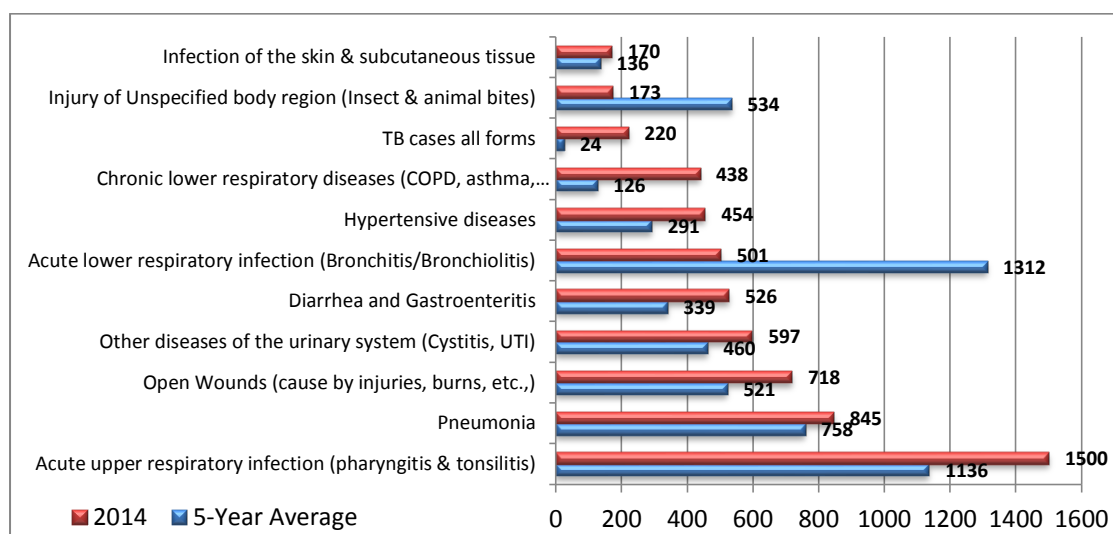
Davao del Norte, 2014 and past 5-year Average (2009-2013)

Causes	2014		5-Year Average	
	Number	Rate	Number	Rate
1. Septicemia	146	6.88	49	2.44
2. Pneumonia	58	2.73	84	4.19
3. Preterms infants	51	2.4	0	0
4. Respiratory & Cardiovascular d/o sp. to Perinatal	50	2.36	58	2.85
5. Congenital Malformations	18	0.85	0	0
6. Disease of the Respiratory System	12	0.57	0	0
7. Other diseases originating in the perinatal period	11	0.52	45	2.23
8. Acute Respiratory Failure	8	0.38	0	0
9. Bacterial Meningitis	6	0.28	19	0.95
10. Dehydration	6	0.28	1	0.05

Source: Provincial Health Office, Davao del Norte

Morbidity is said to be the common diseases that occur in the locality. In 2014, acute upper respiratory infection took the top place in Davao del Norte. Other top reported causes are open wounds due to injuries, pneumonia, other diseases of the urinary system and diarrhea and gastroenteritis. As presented in the 5-year average for Davao del Norte, acute lower respiratory infection with 12,567 or 1,312 rate per 100,000 and acute upper respiratory infection with 10,880 or 1,136 rate per 100,000 are the leading causes followed by open wounds, pneumonia and other diseases of the urinary system (Table No. 3-150). While Figure No. 28 illustrates that the rate of 1,500 cases in 2014 has exceeded the 5-year average rate of 1,136.

**Figure No. 28 : Morbidity Leading Causes**  
Rate per 100,000 population  
Davao del Norte, 2014 and past 5-year Average (2009-2013)



Source: PHO, Davao del Norte

**Table No. 3-149 : Leading Causes of Morbidity**  
Davao del Norte, CY 2014 and 5-Year Average

	CAUSES	2014		5 – Year Average	
		Number	Rate	Number	Rate
1	Acute Upper Resp. Infection (pharyngitis & tonsillitis)	15,661	1499.81	10,880	1,136
2	Pneumonia	8,822	844.86	7,260	758
3	Open Wounds (cause by injuries, burns, etc.)	7,496	717.87	4,988	521
4	Other diseases of the urinary system (Cystitis, UTI)	6,238	597.40	4,410	460
5	Diarrhea and Gastroenteritis	5,493	526.05	3,250	339
6	Acute lower respiratory infection (Bronchitis/ Bronchiolitis)	5,227	500.57	12,567	1,312
7	Hypertensive diseases	4,740	453.94	2,785	291
8	Chronic lower respiratory diseases (COPD, asthma, emphysema)	4,575	438.13	1,204	126
9	TB cases all forms	2,297	219.98	233	24
10	Rabies	1,809	173.24	5,510	534
11	Infections of the skin & subcutaneous tissue	1,770	169.51	1,299	136

Source: PHO, Davao del Norte

Comparing to other provinces in the region, Davao del Norte has the most number of reported cases on acute upper respiratory infection and next to Davao City in acute lower respiratory infection cases. Table No. 3-150.

*Table No. 3-150 : Leading Causes of Morbidity  
Region XI, by Province/City, 2013*

	CAUSES	DEL NORTE		COMVAL		DEL SUR		ORIENTAL		DAVAO CITY	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1.	Acute Upper Respiratory Infection	12,656	<b>1,241</b>	2,732	<b>377</b>	-	-	4,236	<b>781</b>	8,860	<b>568</b>
2.	Acute Lower Respiratory Infection	15,997	<b>1,569</b>	8,652	<b>1,194</b>	6,978	<b>761</b>	5,366	<b>990</b>	18,529	<b>1,189</b>
3.	Pneumonia	6,594	<b>647</b>	1,096	<b>151</b>	928	<b>101</b>	2,053	<b>379</b>	14,046	<b>901</b>
4.	Diarrhea All Forms	3,736	<b>366</b>	738	<b>102</b>	907	<b>99</b>	1,975	<b>364</b>	6,891	<b>442</b>
5.	Urinary Tract Infection	5,463	<b>536</b>	943	<b>130</b>	868	<b>95</b>	961	<b>177</b>	5,026	<b>322</b>
6.	Respiratory Tuberculosis	2,166	<b>212</b>	1,221	<b>169</b>	1,510	<b>165</b>	1,200	<b>221</b>	3,766	<b>242</b>
8.	Hypertensive Diseases	4,083	<b>400</b>	-	-	1,254	<b>137</b>	2,852	<b>526</b>	4,000	<b>257</b>
10.	Influeza	-	-	-	-	773	<b>84</b>	372	<b>69</b>	-	-
11.	Diseases of the Heart	-	-	-	-	-	-	-	-	1,911	<b>123</b>
12.	Anemia	-	-	382	<b>53</b>	-	-	-	-	-	-
13.	Bronchial Asthma	1,786	<b>175</b>	269	<b>37</b>	243	<b>27</b>	-	-	1,848	<b>119</b>
14.	Gastritis	1,286	<b>126</b>	332	<b>46</b>	-	-	920	<b>170</b>	-	-
16.	Dengue	797	<b>78</b>	1,067	<b>147</b>	1,047	<b>114</b>	1,260	<b>232</b>	7,340	<b>471</b>
17.	Malnutrition	-	-	-	-	291	<b>32</b>	-	-	-	-

Source: Provincial Health Office, Davao del Norte

Infectious diseases remain to be the significant causes of morbidity such as acute upper respiratory infection and acute lower respiratory infection while diarrhea and gastroenteritis can be attributed to sanitation. Hypertension and other life-style related diseases are however preventable. The prevalence of these illnesses can be attributed to lack of health providers, inadequate health service facilities and patient's lack of awareness on health and nutrition. There is a need to intensify advocacy, promote and adopt behavioral change for healthy lifestyle.

There is also a need to strengthen the capability and skills of midwives through the provision of training on Newborn Screening, Integrated Management of Childhood Illness (IMCI), Essential Intra Partum Newborn Care (EINC), Breastfeeding, Safe Motherhood and Cold Chain Management. The provision of medicines, vaccines and supplies for child care should be reinforced in all LGUs.

### **Vulnerability of Health Sector to Dengue**

Indicators used to determine the vulnerability of health sector to dengue are : rainfall volume, access to level III water supply, and use of material recovery facility (MRF). For exposure indicators: household with access to sanitary toilets, and access to level III water supply. And for adaptive capacity, indicators used are access to proper waste disposal facility and IEC campaign. All cities and municipalities have moderate to low vulnerability to dengue.

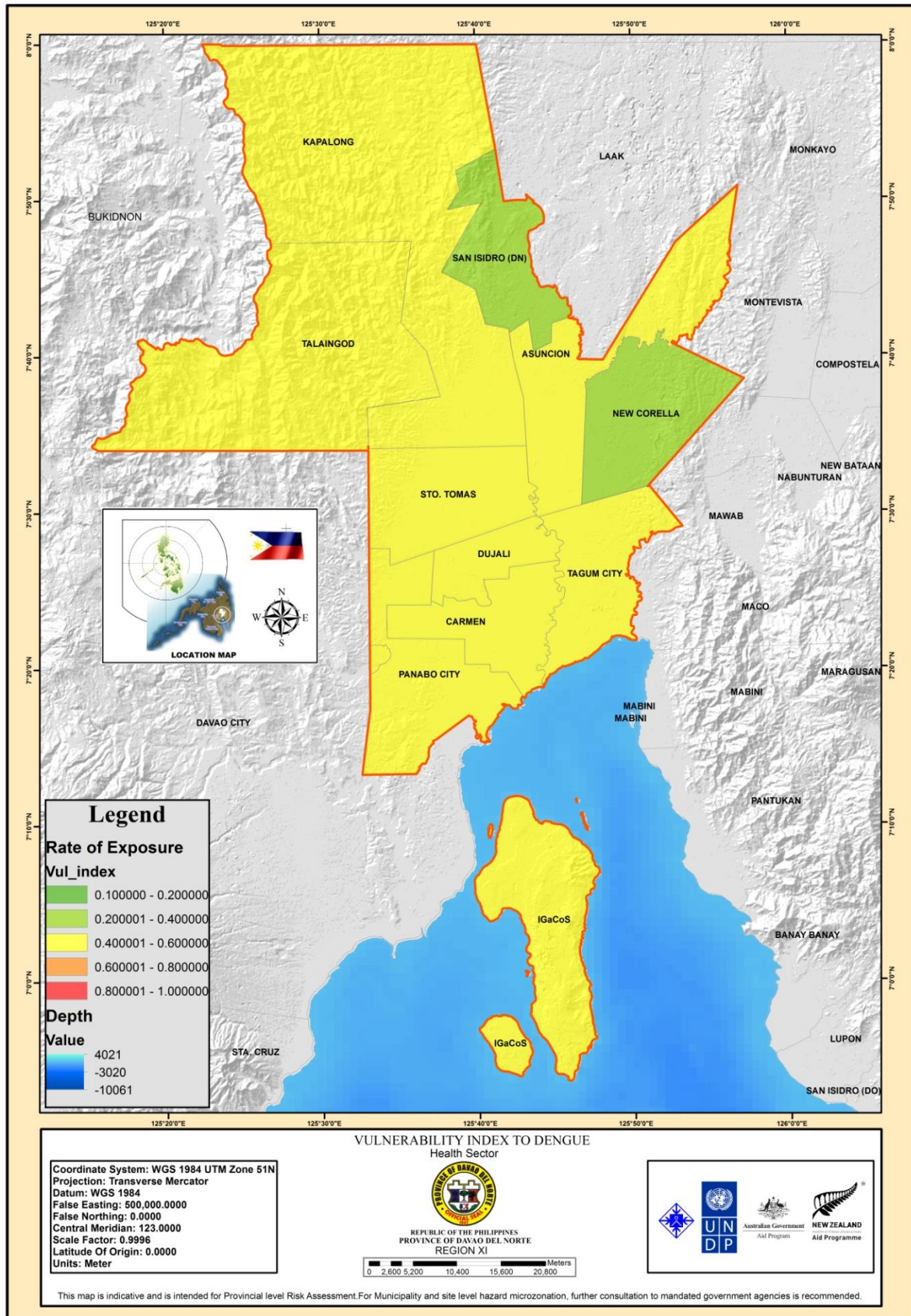
*Table No. 3-151 : Level of Vulnerability of Health Sector to Dengue*

By City/Municipality, Davao del Norte, CY 2013

City/ Municipality	Sensitivity Value (Weighted Average)	Exposure Value (Weighted Average)	Adaptive Capacity Value (Weighted Average)	Vulnerability Index (Weighted Average)	Vulnerability Category
Asuncion	0.72	0.32	0.48	0.508	Moderate
BE Dujali	0.60	0.02	0.48	0.424	Moderate
Carmen	0.60	0.32	0.48	0.466	Moderate
IGaCoS	0.48	0.32	0.60	0.46	Moderate
Kapalong	0.72	0.20	0.60	0.502	Moderate
New Corella	0.48	0.02	0.48	0.382	Low
Panabo City	0.60	0.02	0.60	0.46	Moderate
San Isidro	0.48	0.20	0.48	0.382	Low
Sto. Tomas	0.72	0.02	0.60	0.502	Moderate
Tagum City	0.60	0.02	0.60	0.46	Moderate
Talaingod	0.48	0.52	0.48	0.494	Moderate

Map No. 46. Level of Vulnerability of Health Sector to Dengue

By City/Municipality, Davao del Norte, CY 2013



**Vulnerability of Health Sector to Malaria**



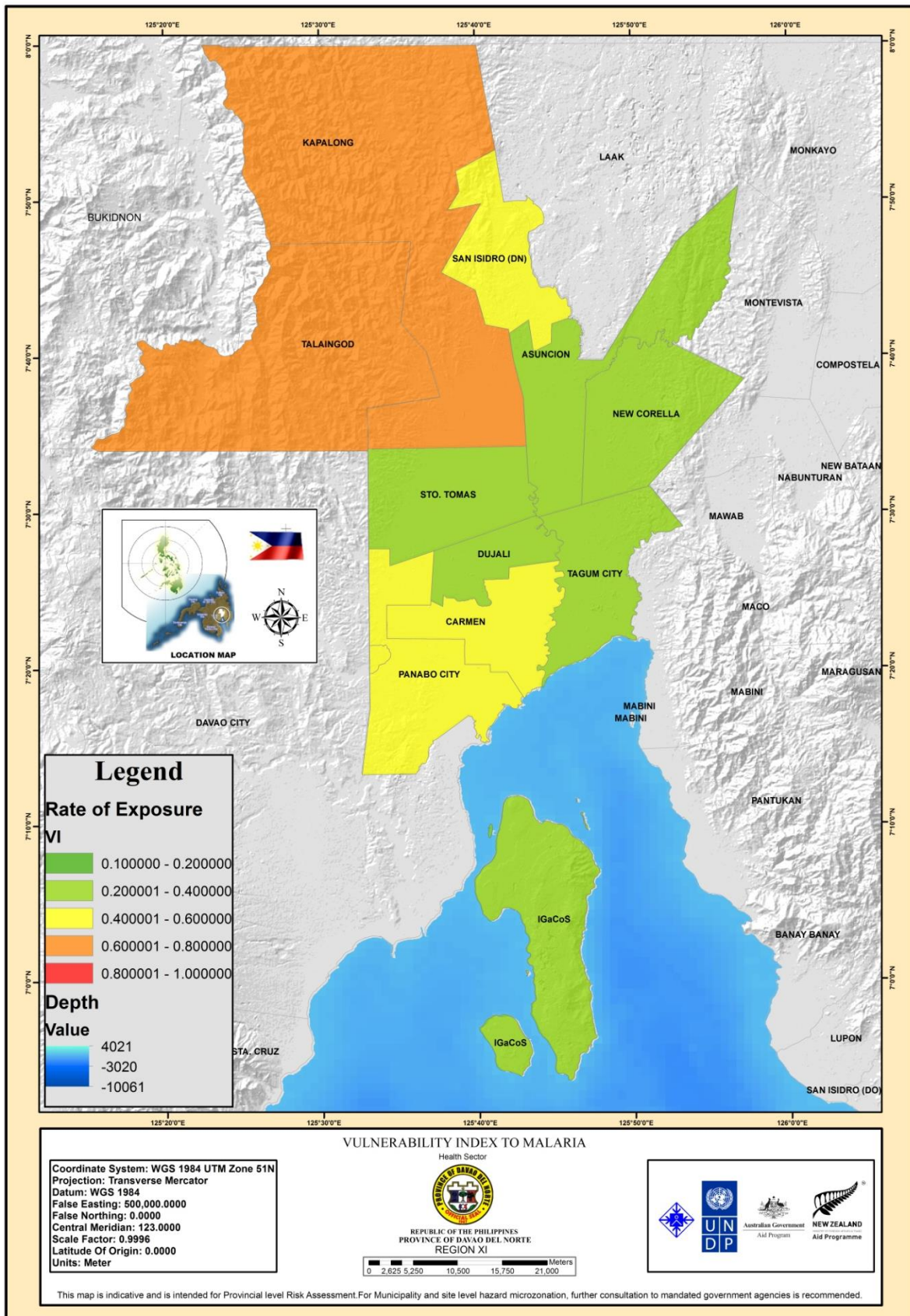
All cities and municipalities have moderate to low vulnerability to malaria except Kapalong and Talaingod which has a high vulnerability category to malaria.

*Table No. 3-152 : Level of Vulnerability of Health Sector to Malaria  
By City/Municipality, Davao del Norte, CY 2013*

<b>City/ Municipality</b>	<b>Sensitivity Value (Weighted Average)</b>	<b>Exposure Value (Weighted Average)</b>	<b>Adaptive Capacity Value (Weighted Average)</b>	<b>Vulnerability Index (Weighted Average)</b>	<b>Vulnerability Category</b>
Asuncion	0.48	0.68	0.2	0.256	Low
BE Dujali	0.48	0.68	0.2	0.256	Low
Carmen	0.60	0.84	0.3	0.468	Moderate
IGaCoS	0.48	0.68	0.2	0.256	Low
Kapalong	0.72	0.84	0.2	0.606	High
New Corella	0.60	0.68	0.2	0.256	Low
Panabo City	0.60	0.56	0.2	0.48	Moderate
San Isidro	0.60	0.44	0.3	0.496	Moderate
Sto. Tomas	0.72	0.56	0.2	0.382	Low
Tagum City	0.48	0.44	0.2	0.256	Low
Talaingod	0.72	1.00	0.2	0.662	High

*Map No. 47: Level of Vulnerability of Health Sector to Malaria Map*

**By City/Municipality, Davao del Norte, CY 2012**



The Operation Timbang (OPT) Plus of the National Nutrition Council is the annual weighing of all preschoolers 0-71 months old or below six year old in a community to identify and locate the malnourished children. Data generated through OPT Plus are used for local nutrition action planning, particularly in quantifying the number of malnourished and identifying who will be given priority interventions in the community. Moreover, results of OPT Plus provide information on the status of the preschoolers and the community in general, thus providing on the effectiveness of the local nutrition program.

In Davao del Norte, the nutritional status of children below seven years old was determined through the conduct of Operation Timbang by Municipality/City. In 2014, there were estimated 169,161 pre-schoolers with 126,783 or 74.94% actual pre-schoolers weighed. Wherein 119,372 or 94% were with normal weight, 4,894 or 3.86% were identified as underweight ; 1,141 or .90% were severely underweight and 1,376 or 1.09% were overweight. Most of the children falling under underweight and the overweight came from Tagum City while most of the severely underweight came from Sto. Tomas. Table No. 3-153.

The over-all result for Davao del Norte points out that the prevalence rate of malnourished among pre-school children is 4.76% and among the municipalities, Talaingod has the highest percentage rate of malnourished with 16.9% followed by 8.7% of San Isidro and 7.98% of Sto. Tomas. Inadequate intake of food due to large families; under employment of parents as well as inadequate food production, were considered as the main causes of malnutrition. The presence of diseases and poor maternal care were also identified as contributory factors in malnutrition particularly to low birth weight among 0-6 month infants.

**Table No. 3-153 : Operation Timbang Result, By City/Municipality  
Davao del Norte, 2014**

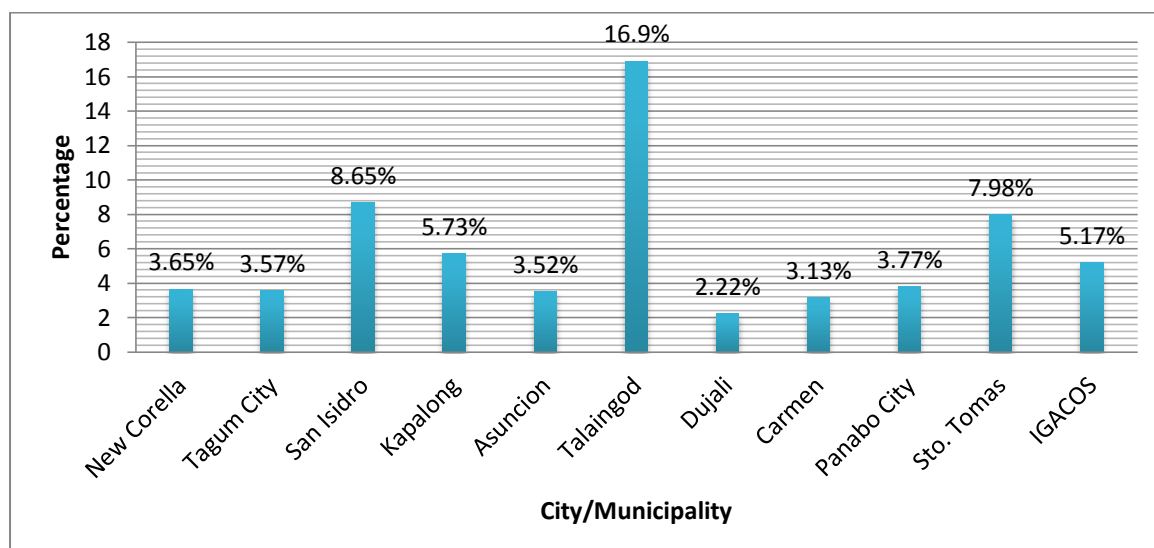
Name of LGU	Estimated No. of PS	Actual PS Weighed	OPT Coverage (%)	No. of Normal	No. of Under-weight PS	No. of Severely Under-weight PS	No. of Over-weight	Total No. of underweight + severely Underweight PS	PREVALENCE RATE	RANK
Talaingod	4,944	2,993	60.53	2,466	335	171	21	506	16.90%	1 <sup>st</sup>
San Isidro	4,228	3,329	78.73	3,017	251	37	24	288	8.65%	2nd
Sto. Tomas	19,657	12,804	65.13	11,584	782	240	198	1,022	7.98%	3rd
Kapalong	11,802	8,927	75.63	8,346	390	122	69	512	5.73%	4th
New Corella	8,639	6,647	76.94	6,368	222	21	36	243	3.65%	5th
Asuncion	9,699	7,004	72.21	6,709	229	18	48	247	3.52%	6th
Carmen	12,286	10,050	81.80	9,653	256	59	82	315	3.13%	7th
BE Dujali	5,524	2,788	50.47	2,707	56	6	19	62	2.22%	8th
IGACOS	16,476	13,400	81.33	12,633	569	125	73	694	5.17%	1st
Panabo City	31,433	21,564	68.60	20,523	666	147	223	813	3.77%	2nd
Tagum City	44,473	37,277	83.82	35,361	1,138	195	583	1,333	3.57%	3rd
<b>TOTAL</b>	<b>169,161</b>	<b>126,783</b>	<b>74.94%</b>	<b>119,372</b>	<b>4,894</b>	<b>1,141</b>	<b>1,376</b>	<b>6,035</b>	<b>4.76%</b>	

Source: Provincial Health Office, Davao del Norte

Figure No. 12 below demonstrates that the municipality with the highest malnutrition rate is Talaingod (16.90%). To answer this felt need, intervention such as the implementation of Gulayan sa Paaralan at Kabahayan needs to be facilitated. Another interventions are the provision of Salter Weighing scales for hard to reach sitios, strengthening of partnership with Municipal Social Welfare and Development Office in their Nutrition Month celebration in Day Care Centers and close coordination with DepEd in Nutrition Month celebration in elementary schools.

Moreover, San Isidro (8.65%) and Sto. Tomas (7.98%) need to strengthen regular monitoring and supervision of nutrition programs, conduct of trainings on nutrition and provision of supplemental feeding and procurement of OPT equipment.

**Figure No. 29 : Prevalence Rate on Malnutrition  
By City/Municipality  
Davao del Norte, 2014**



**Table No. 3-154 : Prevalence Rate on Malnutrition  
By City/Municipality  
Davao del Norte, 2014**

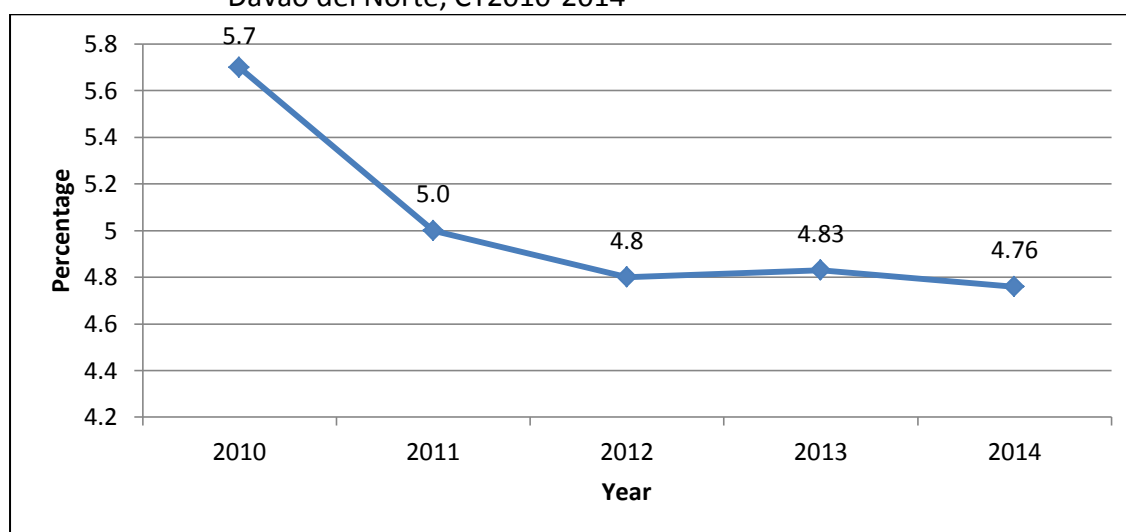
City/ Municipality	2014	
	No.	Rate
Asuncion	247	3.52%
Carmen	315	3.13%
Dujali	62	2.22%
IGACOS	694	5.17%
Kapalng	512	5.73%
New Corella	243	3.65%
Panabo City	813	3.77%
San Isidro	288	8.65%

Sto. Tomas	1022	7.98%
Tagum City	1333	3.57%
Talaingod	506	16.90%

Source: Provincial Health Office, Davao del Norte

Figure No. 30 shows the 5-year (2010-2014) trend on malnutrition rate in Davao del Norte. A decreasing trend is noted from 5.70% in 2010 to 4.76% in 2014.

**Figure No. 30 : 5-Year Trend on Malnutrition Rate**  
(0-71 Months Old Preschool Children)  
Davao del Norte, CY2010-2014



The significant improvement on the nutrition status of pre-school children can be accredited to the active support and involvement of the Barangay Nutrition Scholars, Provincial Nutrition Council (PNC) and other stakeholders. The eradication of extreme poverty and hunger is the number 1 Goal of the Millenium Development Goal (MDG). Achievements in reducing malnutrition need to be sustained through the collaborative effort of every sector by continuously advocating the implementation of service delivery.

#### **ISSUES AND CONCERNS AND UNDERLYING POSSIBLE CAUSES**

1. Despite past efforts to improve access to health services, the province continues to face this challenge. This could be due to urban-rural bias or disparity of distribution of services. The peace and order condition and the distance of an area could also be contributory to the impediment of the prompt delivery of services.
2. The province continues to experience increasing number of maternal death (15 in 2012, 24 in 2013, and 33 in 2014). These happen despite the fact that most cases of maternal mortality can be considered preventable given proper access to interventions. Overall, the evident risk factor linked with poor level of maternal health is the delay in seeking health care.



3. There is increasing number of infant death. This can be directly associated to health care among pregnant women. There is a need to pursue more aggressive measure to reduce infant deaths.
4. There is a need to give more focus on the prevention and treatment of infectious and communicable diseases. Sizable of this is related to respiratory (acute lower and upper respiratory and pneumonia) and other is related to sanitation which is open wounds, diarrhea, and rabies. And life-style related diseases, such as heart diseases, hypertensive diseases, cerebro vascular diseases and diabetes millitus. These are the province's leading causes of mortality and morbidity.
5. The average number of public health service provider is below the national standard target of 1:20,000. The government needs to address this gap.

#### **GOAL**

1. To sustain provision of quality health care for all Dabaonons

#### **OBJECTIVES**

1. To increase access to health facilities and services
2. To reduce maternal death rate by 50/100,000 by 2016
3. To attain zero infant mortality by 2016
4. To increase access to BEMONC/CEMONC facilities
5. To increase knowledge on proper nutrition, encourage physical activities and limit consumption of instant food preparation.
6. To increase number of public health providers to meet national standard ratio to population by 2022
7. To decrease number of life-style related diseases.

#### **STRATEGIES**

1. Maximize support by the LGUs in financing barangay health stations through local government support.
2. Revisit existing policies/regulations in the provision of health facilities.
3. Scale-up public health intervention for Millineum Development Goals.
4. Strengthen the implementation of Maternal Neonatal Child Health and Nutrition (MNCHN) Program.
5. Regular conduct of quarterly maternal death review wherein parties that are directly and indirectly involved in the maternal deaths are invited.
6. Capacitating the health personnel not only the public service providers but also the private stakeholders that directly take care of the pregnant and expectant mothers
7. Contributed efforts of the organized Community Health Team members (CHTs) in every barangay in order for them to be functional.
8. Procurement of Newborn Kits
9. Conduct BEMONC/CEMONC trainings
10. Conduct Newborn Screening Training
11. Strengthen the Family Planning Program

12. Increase awareness on Pre and Post Natal check-up.
13. Conduct advocacy on proper nutrition, physical fitness program, and healthy food preparation.
14. Encourage regular physical examination and annual and semi-annual laboratory examinations
15. Ensure the improvement in the performance indicator of LGUs in the scorecard rating particularly in the human resources for health ratio to population.

## **PROGRAMS, PROJECTS AND ACTIVITIES**

### **a. Health Governance Program**

- Local health Support Project

### **b. Family Health care Program**

- Mother And Child Health care Project
- Nutrition Health Project
- Family Planning and Responsible Parenthood Project

### **c. Environmental Health Program**

- Water and Sanitation Project
- Water Bacteriology Laboratory Project
- Vector Control (Malaria, Dengue and Filaria) Project

### **d. Disease Prevention and Control Program**

- Prevention and Control of Communicable Disease Project
- Prevention and Control of non-Communicable Disease Project

### **e. Health Care Services Program**

- Philhealth Sponsored Project

## **6.3.2 Education Services**

### **a. Facilities**

Table No. 3-155 shows that Davao del Norte has a total of 386 elementary schools, 296 of which are public schools and 90 are private schools. The Island Garden City of Samal (IGACOS) has the most number of schools. On the other hand, there are 107 secondary schools, 71 of which are public schools and 36 are private institutions. Panabo City together with Tagum City has the most number of schools. This indicates that basic education is accessible in both elementary and secondary levels in all barangays of the province.

**Table No. 3-155 : Education Facilities, by level  
Davao del Norte, SY 2014 - 2015**

City/ Municipality	Elementary			Secondary		
	Public	Private	Total	Public	Private	Total
Asuncion	27	1	28	3	1	4
BE Dujali	10	2	12	3	1	4
Carmen	21	4	25	6	1	7
Kapalong	31	5	36	7	4	11
New Corella	27	2	29	3	1	4
San Isidro	15	-	15	3	-	3
Sto. Tomas	25	7	32	7	4	11
Talaingod	14	1	15	2	-	2
Panabo City	44	12	56	12	9	21
Tagum City	31	29	60	12	9	21
IGACOS	51	27	78	13	6	19
<b>Davao del Norte</b>	<b>296</b>	<b>90</b>	<b>386</b>	<b>71</b>	<b>36</b>	<b>107</b>

Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCos

Table No. 3-156 shows that there are 21 registered tertiary institutions in Davao del Norte offering various courses/degrees, two of which are State Universities and Colleges (SUCs) while 19 are private institutions. Accounting the number of government higher institutions, education is quite inaccessible to marginal sector because SUCs adheres the access and equity regulations but selective admissions in nature as compared to private higher institutions.

In terms of operations, 57% or 12 tertiary institutions are operating in Tagum City. Hence, there are also four institutions whose main campuses are in Davao City.

**Table No. 3-156 : Educational Facilities, Tertiary  
Davao del Norte, 2015**

	INSTITUTION	LOCATION
1.	ACES Polytechnic College	Panabo City
2.	ACES Tagum College	Tagum City
3.	ACLIC College of Tagum City	Tagum City
4.	Arriego College Foundation	Tagum City
5.	Davao del Norte State College	Panabo City
6.	Davao Winchester Colleges, Inc.	Sto. Tomas
7.	Holy Cross of Davao College-Babak	IGACOS
8.	Kapalong College of Arts, Sciences & Technology	Kapalong
9.	Liceo de Davao	Tagum City
10.	North Davao Colleges	Panabo City
11.	NDC- TAGUM Foundation	Tagum City

12.	Northlink Technological College	Panabo City
13.	Queen of Apostles College Seminary	Tagum City
14.	Saint Mary's College	Tagum City
15.	St. Thomas More School of Law and Business	Tagum City
16.	Tagum City College of Science and Technology Foundation.	Tagum City
17.	Tagum Doctors College	Tagum City
18.	UM Panabo College	Panabo City
19.	UM Peñaplata College	IGACOS
20.	UM Tagum College	Tagum City
21.	University of Southeastern Philippines- College of Agriculture	Tagum City

Source : CHED, Region XI

Table No. 3-157 shows that various public and private Technical Vocational Institutions (TVIs) registered with the Technical Education and Skills Development Authority (TESDA) located in Kapalong, Tagum City , Braulio E. Dujali, Sto. Tomas, Panabo City and IGaCoS provide Post-Secondary Technical Vocational Education and Training (TVET) programs. Tagum City, the economic hub and capital city of the province has the most number of TVIs over the period of three (3) years followed by Panabo City. IGaCoS has registered programs along tourism sector, being the tourism destination in the region. The increasing trend of TVIs can be attributed to the growing demand of skilled workers in the labor market.

**Table No. 3-157 : Technical Vocational Institutions  
Davao del Norte, 2012-2014**

City/Municipality	No. of Technical Vocational Institutions		
	2012	2013	2014
Kapalong	1	2	2
Tagum City	22	23	25
Braulio E. Dujali	1	1	1
Sto. Tomas	3	3	3
Panabo City	8	9	9
IGaCoS	2	3	3
<b>Davao del Norte</b>	<b>37</b>	<b>41</b>	<b>43</b>

Source: TESDA, Davao del Norte

Enrolment in the tertiary level has also been increasing from 18,975 in SY 2013-2014 to 25,233 in SY 2014-2015 with the University of Mindanao - Tagum Campus has the most number of enrolments in various courses as shown in Table No. 3-158 . However, this data does not represent the students who are residents of Davao del Norte alone, as there are those who came from outside the province. The increase of enrolment can be attributed

to some factors such as increasing the number of Pantawid Familyang Pilipino Program or the 4P's beneficiaries which provides cash incentives to identified poor households and the expanded LGU (Municipal, City and Provincial) and NGO scholarships that comply with requirements on school children's regular school needs.

**Table No. 3-158: Enrolment, by School**  
Davao del Norte, SY 2013-2015

Name of School	SY 2013-14	SY 2014-15	Increase/ Decrease
1. ACES Polytecnic College	517	495	-22
2. ACES Tagum College	679	733	54
3. ACLC College of Tagum City	147	246	99
4. Arriescado College Foundation	705	654	-51
5. Davao del Norte State College	1737	1540	-197
6. Davao Winchester Colleges, Inc.	133	385	252
7. Holy Cross of Davao College-Babak	189	127	-62
8. Kapalong College of Arts, Sciences & Technology	851	1824	973
9. Liceo de Davao	135	1112	977
10. North Davao Colleges	953	80	-873
11. NDC- TAGUM Foundation	-	368	-
12. Northlink Technological College	22	133	111
13. Queen of Apostles College Seminary	-	388	
14. Saint Mary's College	2588	1500	-1088
15. St. Thomas More School of Law and Business	338	370	32
16. Tagum City College of Science and Technology Foundation.	406	508	102
17. Tagum Doctors College	208	276	68
18. UM Panabo College	434	1371	937
19. UM Peñaplata College	325	418	93
20. UM Tagum College	8608	9537	929
21. University of Southeastern Philippines- College of Agriculture	No data Available	3168	-
<b>TOTAL</b>	<b>18,975</b>	<b>25,233</b>	<b>6258</b>

Source: CHED, Region XI

Enrolment in TVET courses has been fluctuating for the past four (4) years as shown in Table No. 3-159. Males outnumbered females in four consecutive school years from 2010-2011 to 2013-2014 with an average enrolment in male trainees at 57.3% compared to females trainees, 42.7%. However, in CY 2014 a slight increase of female enrollees (5,910 or 52%) than male (5,456 or 48%) is noted. The sudden shift of enrolment is attributed to



the social acceptance, high marketability and employability demand of women skilled workers in the international labor market congruous to male skilled-workers.

**Table No. 3-159: TVET Enrollment, by Sex and Year**  
Davao del Norte, 2010-2015

SCHOOL YEAR	TOTAL	ENROLMENT			
		Female		Male	
		No.	%	No.	%
2010-2011	4190	1,692	40.38	2,498	59.62
2011-2012	4939	1,842	37.29	3,097	62.71
2012-2013	6442	3,088	47.9	3,354	52.06
2013-2014	6,723	2,993	45	3,730	55
2014-2015	11,366	5,910	52	5,456	48

Source: TESDA, Davao del Norte

As shown in Table No. 3-160, TVET Enrolment by qualification/course for CY 2013-2014 has been fluctuating and varies among male and female trainees. The Computer Hardware Servicing NC II has the most number of enrollees while the least is Plumbing NC II. The trend shows that both male and female enrollees still prefer the traditional way of choosing programs.

**Table No. 3-160 : TVET Enrolment, by Qualification/Course**  
Davao del Norte, CY 2013-2014

Qualification	Summary of Enrollment				
	Total	Female		Male	
		No.	%	No.	%
Automotive Servicing NC I	1007	24	2.38	983	97.62
Automotive Servicing NC II	2589	73	2.85	2516	97.15
Bartending NC II	402	203	50.50	199	49.50
Beauty Care NC II	30	29	96.67	1	3.33
Bookkeeping NC II	1141	1050	92.02	91	7.98
Caregiving NC II	153	132	86.27	21	13.73
Carpentry NC II	13	2	15.38	11	84.62
Commercial Cooking NC II	164	106	64.63	58	35.37
Computer Hardware Servicing NC II	4286	2043	47.67	2243	52.33
Consumer Electronics Servicing NC II	437	30	6.86	407	93.14
Technical Drafting NC II	66	23	34.85	43	65.15
Dressmaking NC II	84	82	97.62	2	2.38
Driving NC II	472	35	7.42	437	92.58
Electrical Installation and Maintenance NC II	614	5	0.81	609	99.19
Finishing Course for Call Center Agent NC II	67	42	62.69	25	37.31

Food and Beverage Services NC II	1745	1013	58.05	732	41.95
Food Processing NC II	272	203	74.63	69	25.37
Heavy Equipment Operation (Forklift) NC II	30	5	16.67	25	83.33
Front Office Servicing NC II	243	124	51.03	119	48.97
Foreign Language ( Nihonggo) – (NTR)	118	101	85.59	17	14.41
Hairdressing NC II	26	24	92.31	2	7.69
Housekeeping NC II	764	123	16.00	641	84.00
Health Care Services NC II	112	101	90.18	11	9.82
Heavy Equipment Operation (Hydraulic Excavator) NC II	15	0	0.00	15	100.00
Massage Therapy NC II	295	203	68.81	92	31.19
Aces Natural Farming	236	106	44.92	130	55.08
Organic Agriculture Production NC II	41	17	40.00	24	60.00
Performing Arts ( Dance ) NC II	120	111	92.50	9	7.50
Performing Arts (Song) NC II	13	10	76.92	3	23.08
Plumbing NC II	4	0	0.00	4	100.00
Programming NC IV	779	406	52.12	373	47.88
RAC Servicing ( PACU/CRE NC II)	49	0	0.00	49	100.00
Security Services NC I	260	73	28.08	187	71.92
Security Services NC II	260	73	28.08	187	71.92
Shielded Metal Arc Welding NC II	762	46	6.04	716	93.96
Standard American English (NTR)	190	105	55.26	85	44.74
Technical Drafting NC II	46	14	30.43	32	69.57
Tile Setting NC II	41	1	2.44	40	97.56
Trainers Methodology	102	42	41.18	60	58.82
Tour Guiding Services NC II	26	15	57.69	11	42.31
Heavy Equipment Operation (Wheel Loader) NC II	15	1	6.67	14	93.33
<b>Total</b>	<b>18,089</b>	<b>6,723</b>	<b>100.00</b>	<b>11,366</b>	<b>100.00</b>

Source: TESDA, Davao del Norte

Table No. 3-161 shows that most of the registered programs offered by TVIs are in the sectors of Tourism, Information and Communication Technology (ICT), Health, Social and Other Community Development Services, Automotive and Land Transport, and Construction. While the economic typology of the province is in agriculture, it can be noted that only one (1) program is offered for agriculture sector which is organic agriculture production while other programs are incongruous to sustain the economic typology of the province.

**Table No. 3-161 : Technical Vocational Institutions with Registered Programs  
Davao del Norte, 2014**

<b>Name of School</b>	<b>Address</b>	<b>Registered Program</b>
A.B.A Cosmetology Carreer Center, Inc.	2540 Mencidor Village, Magugpo East, Tagum City Davao del Norte	<ul style="list-style-type: none"> <li>• Beauty Care (Nail Care)NC II (216 Hours)</li> <li>• Hairdressing NC II (565 Hours)</li> </ul>
ABA Technical School of Sto. Tomas, Inc.	Fd Rd. 2 Tibal-og, Sto. Tomas, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II (356 Hours)</li> </ul>
ABA Technical Institute of Dujali, Inc.	Braulio E. Dujali, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II (532 Hours)</li> </ul>
Aces Polytechnic College, Inc.	Tadeco Road, San Francisco, Panabo City, Davao del Norte	<ul style="list-style-type: none"> <li>• Organic Agriculture Production NC II (232 Hours)</li> <li>• Organic Agriculture Production NC II under Mobile Training Classroom, Park and Train Program (MBC-PTP) (232 Hours)</li> <li>• Computer Hardware Servicing NC II (460 Hours)</li> <li>• Finishing Course for Call Center Agents NC II (100 Hours)</li> <li>• Housekeeping NC II (485 Hours)</li> <li>• Programming NC IV (330 Hours)</li> <li>• Standard American English (NTR) (140 Hours)</li> </ul>
Aces Tagum College, Inc.	Mankilam, Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II (460 Hours)</li> <li>• Consumer Electronics Servicing NC II (438 Hours)</li> <li>• Housekeeping NC II (436 Hours)</li> <li>• Programming NC IV (330 Hours)</li> </ul>
ACLIC College of Tagum City, Inc.	CAP Bldg., National Highway, Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III (292 Hours)</li> <li>• Computer Hardware Servicing NC II (356 Hours)</li> <li>• Housekeeping NC II (436 Hours)</li> <li>• Programming NC IV (252 Hours)</li> <li>• Computer Programming and Network Technology (608 Hours)</li> </ul>
Arriescado College Foundation, Inc.	Bonifacio St., Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Caregiving NC II (786 Hours)</li> <li>• Food and Beverage Services NC II (480 Hours)</li> <li>• Housekeeping NC II (508 Hours)</li> </ul>
BFSAI Training Center Inc.	3505 Mirafuentes St., Tagum City Davao del Norte	<ul style="list-style-type: none"> <li>• Security Services NC I (170 Hours)</li> <li>• Security Services NC II (Amended) (223 Hours)</li> </ul>
Computersense College of Communication and Technology, Inc. - Panabo Branch	2 <sup>nd</sup> Floor Cabang Building, National Highway Cor. Cabaluna St., Panabo City Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II (356 Hours)</li> <li>• Housekeeping NC II (436 Hours)</li> </ul>
Davao Northphil Institute of Technology, Inc.	Mankilam, Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II (462 Hours)</li> <li>• Consumer Electronics Servicing NC II (569 Hours)</li> <li>• Driving NC II (153 Hours)</li> <li>• Electrical Installation Maintenance NC II (603 Hours)</li> </ul>
Davao Winchester College, Inc.	Sto. Tomas, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing (462 Hours)</li> <li>• Housekeeping NC II (565 Hours)</li> <li>• Food and Beverage NC II (530 Hours)</li> </ul>
DPWH Training Center	Tagum City Davao del Norte	<ul style="list-style-type: none"> <li>• Heavy Equipment Operation (Hydraulic Excavator) NC II (206 Hours)</li> <li>• Heavy Equipment operation (Forklift) NC II</li> </ul>

		(206 Hours) • Heavy Equipment Operation (Wheel Loader) NC II (206 Hours)
East Asian College of Panabo, Inc.	San Francisco, Panabo City, Davao del Norte (new address)	• Computer Hardware Servicing NC II (462 Hours) • Health Care Services NC II (1,116 Hours) • Performing Arts (Dance) NC II (1,782 Hours) • Performing Arts (Song) NC II (1,674 Hours) • Foreign Language (Nihongo) NTR (300 Hours)
Endonela Institute of Technology Foundation, Inc. – Tagum Branch	Prk. Daneco, Brgy. Magugpo East, Tagum City, Davao del Norte	• Shielded Metal Arc Welding NC II (268 Hours)
Estela College, Inc.	Sto. Tomas, Davao del Norte	• Automotive Servicing NC II (632 Hours) • Computer Hardware Servicing NC II (462 Hours)
Fides Institute for Security Training Inc.	Park Narra, Visayan Village, Tagum City, Davao del Norte	• Security Services NC I (170 Hours) • Security Services NC II (223 Hours)
International Spiritual and Material Therapeutic Massage Tagum City, Inc.	Magugpo South, Tagum City, Davao del Norte	• Massage Therapy NC II (560 Hours)
Global Education Technology of Kapalong, Inc.	P 9B, Highway, Maniki, Kapalong, Davao del Norte,	• Housekeeping NC II (567 Hours) • Food and Beverage Services NC II (491 Hours)
Goncar Security Training Academy, Inc.	2F Gonzales Bldg., Pioneer Ave., Tagum City Davao del Norte	• Security Services NC I (170 Hours) • Security Services NC II (223 Hours)
Jireh Skills Training and Development Center, Inc.	Jireh Mission Compound, Prk. 6 Brgy. Caliclic, District of Babak, Island Garden City of Samal, Davao del Norte	• Computer Hardware Servicing NC II (356 Hours) • Housekeeping NC II (436 Hours) • Food and Beverage Services NC II (385 Hours)
Maryknoll College of Panabo, Inc.	Prk. Atis, Sto. Niño, Panabo City Davao del Norte	• Bartending NC II (427 Hours) • Food and Beverage Services NC II (392 Hours) • Housekeeping NC II (472 Hours)
Magugpo Institute of Technology, Inc.	Lagmar Bldg., cor. Osmeña&Mabini St. Tagum City	• Computer Hardware Servicing NC II (462 Hours) • Consumer Electronics Servicing NC II (569 Hours) • Housekeeping NC II (567 Hours) • Programming NC IV (378 Hours)
NDC Tagum Foundation, Inc.	Apokon Road, Tagum City	• Health Care Services NC II (996 Hours)
North Davao Colleges, Inc.	Panabo City, Davao del Norte	• Health Care Services NC II (996 Hours)
Northern Paramedical and Technological College of Panabo, Inc.	New Pandan, Panabo City Davao del Norte	• Computer Hardware Servicing NC II (463 Hours)
Northlink Technological College, Inc.	National Highway, Brgy. New Pandan, Panabo City, Davao del Norte	• Cookery NC II (345 Hours) • Computer Hardware Servicing NC II(462 Hours) • Food and Beverage Servicing NC II(385 Hours) • Housekeeping NC II (436 Hours)

		<ul style="list-style-type: none"> <li>• Programming NC IV (328 Hours)</li> </ul>
Prestige School of Technology, Inc.	Brgy. Miranda, Babak District, Igacos Davao del Norte	<ul style="list-style-type: none"> <li>• Food and Beverage Servicing NC II(385 Hours)</li> <li>• Front Office Servicing NC II (471 Hours)</li> </ul>
Saint John Learning Center of Tagum City, Inc.	Boja Arcade, Rizal St. Tagum City Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III (292 Hours)</li> </ul>
STI Gillamac Information Technology Center, Inc. (STI Tagum)	Gillamac Bldg., Mabini St., Magugpo, Tagum City	<ul style="list-style-type: none"> <li>• Commercial Cooking NC II(Amended)(436 Hours)</li> <li>• Computer Hardware Servicing NC II (1,908)</li> <li>• Food and Beverage Services NC II (372 Hours)</li> <li>• Programming NC IV (1,442 Hours)</li> </ul>
St. John Education System, Inc.	Quezon St., Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III (292 Hours)</li> <li>• Finishing Course for CCA NC II (100 Hours)</li> </ul>
Tagum City College of Science and Technology Foundation, Inc.	Elpidio M. Gazmen Compound, Gazmen Rd., Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III (380 Hours)</li> <li>• Computer Hardware Servicing NC II (462 Hours)</li> <li>• Driving NC II (154 Hours)</li> <li>• Food Beverage Services NC II (500 Hours)</li> <li>• Programming NC IV (330 Hours)</li> </ul>
Tagum City Trade School	Apokon, Tagum City Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III (379 Hours)</li> <li>• Carpentry NC II (243 Hours)</li> <li>• Computer Hardware Servicing NC II(463 Hours)</li> <li>• Consumer Electronics Servicing NC II(438 Hours)</li> <li>• Dressmaking NC II (275 Hours)</li> <li>• Electrical Installation &amp; Maintenance NC II, (402 Hours)</li> <li>• Food Processing NC II (568 Hours)</li> <li>• Housekeeping NC II, (436 Hours)</li> <li>• Masonry NC II (336 Hours)</li> </ul>
Tagum Longford College, Inc.	UNP2 Bldg., Circumferential Road, Public Market, Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III, (292 Hours)</li> <li>• Computer Hardware Servicing NC II(392 Hours)</li> <li>• Housekeeping NC II (435 Hours)</li> </ul>
The Leores Training Academy, Inc.	2548 Quezon St., Panabo City, Davao del Norte	<ul style="list-style-type: none"> <li>• Caregiving NC II (786 Hours)</li> <li>• Health Care Services NC II (996 Hours)</li> <li>• Massage Therapy NC II (560 Hours)</li> </ul>
The Philippine Center for Innovative Training and Education, Inc.	3rd Flr Gabriel II Bldg., Apokon Rd. cor National Highway Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II(392 Hours)</li> <li>• Food and Beverage Services NC II (356 Hours)</li> <li>• Housekeeping NC II (436 Hours)</li> <li>• Programming NC IV (252 Hours)</li> </ul>
University of Mindanao, Inc. - Tagum Branch	8100 Mabini St., Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Caregiving NC II (854 Hours)</li> </ul>
University of Mindanao, Inc. - Peñaplata Branch	Peñaplata, Island Garden City of Samal, Davao del Norte	<ul style="list-style-type: none"> <li>• Computer Hardware Servicing NC II (432 Hours)</li> <li>• Housekeeping NC II (556 Hours)</li> </ul>
University of Mindanao, Inc. - Panabo Branch	P. Arguilles St., Brgy. San Francisco, Panabo City, Davao del Norte	<ul style="list-style-type: none"> <li>• Bookkeeping NC III (380 Hours)</li> <li>• Computer Hardware Servicing NC II(510 Hours)</li> </ul>
Valiant Technical Institute and Assessment Center, Inc.	Bangoy St., Salvacion, Panabo City, Davao del Norte	<ul style="list-style-type: none"> <li>• Automotive Servicing NC I, (374 Hours)</li> <li>• Automotive Servicing NC II (680 Hours)</li> </ul>
Ventura College of	Prk. Bautista, Mankilam,	<ul style="list-style-type: none"> <li>• Hilot ( Wellness Massage) NC II (160 Hours)</li> </ul>



Natural Therapeutic Health & Sciences, Inc.	Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Massage Therapy NC II (560 Hours)</li> </ul>
White Lamp School, Inc.	Apokon, Tagum City, Davao del Norte	<ul style="list-style-type: none"> <li>• Caregiving NC II,(1,060 Hours)</li> <li>• Health Care Services NC II (1,150 Hours)</li> </ul>

Source: TESDA, Davao del Norte

Table No. 3-162 shows that enrolment in the Post-Secondary TVIs has also been increasing from 6,723 in CY 2013 to 11,366 in CY 2014 with an increase margin of 4,643. However, this data does not represent the trainees who are residents of Davao del Norte alone, as there are those who came from outside of the province. The Tagum City Trade School has the highest number of enrollees in various registered programs. The increase of enrollees from CY 2013 to 2014 can be attributed to the increase in the provision of scholarship programs for TVET by the current administration and the increase of awareness and acceptance of people on TVET.

It can be noted that TVET delivery is competency based approach and implementation is based on the training duration which is computed in training hours as prescribed in the Training Regulations (TRs) for every registered program hence, training starts and ends anytime of the year.

**Table No. 3-162 : Enrolment, by TVIs**  
Davao del Norte, CY 2013-2014

Name of School	2013	2014	Increase/ Decrease
A.B.A Cosmetology Career Center, Inc.	17	39	<b>22</b>
ABA Technical School of Sto. Tomas, Inc.	100	158	<b>58</b>
ABA Technical Institute of Dujali, Inc.	10	10	<b>0</b>
Aces Polytechnic College, Inc.	372	729	<b>357</b>
Aces Tagum College, Inc.	498	384	<b>-114</b>
ACLIC College of Tagum City, Inc.	0	14	<b>14</b>
Arriessgado College Foundation, Inc.	77	150	<b>73</b>
Computersense College of Communication and Technology, Inc. - Panabo Branch	0	108	<b>108</b>
Davao Northphil Institute of Technology, Inc.	921	558	<b>-363</b>
Davao Winchester College, Inc.	159	210	<b>51</b>
DPWH Training Center	60	0	<b>-60</b>
East Asian College of Panabo, Inc.	237	299	<b>62</b>
Endonela Institute of Technology Foundation, Inc. – Tagum Branch	372	510	<b>138</b>
Estela College, Inc.	107	15	<b>-92</b>
Fides Institute for Security Training Inc.	83	0	<b>-83</b>
International Spiritual and Material Therapeutic Massage Tagum City, Inc.	126	154	<b>28</b>
Global Education Technology of Kapalong, Inc.	140	99	<b>-41</b>
Goncar Security Training Academy, Inc.	140	15	<b>-125</b>
Jireh Skills Training and Development Center, Inc.	405	801	<b>396</b>
Maryknoll College of Panabo, Inc.	0	0	<b>0</b>
Magugpo Institute of Technology, Inc.	8	562	<b>554</b>
Mindtechs Institute of Technology, Inc.	171	363	<b>192</b>

NDC Tagum Foundation, Inc.	0	0	<b>0</b>
North Davao Colleges, Inc.	0	24	<b>24</b>
Northern Paramedical and Technological College of Panabo, Inc.	41	140	<b>99</b>
Northlink Technological College, Inc.	266	856	<b>590</b>
Prestige School of Technology, Inc.	0	554	<b>554</b>
Saint John Learning Center of Tagum City, Inc.	1	197	<b>196</b>
STI Gillamac Information Technology Center, Inc. (STI Tagum)	385	31	<b>-354</b>
St. John Education System, Inc.	82	4	<b>-78</b>
Tagum City College of Science and Technology Foundation, Inc.	338	358	<b>20</b>
Tagum City Trade School	852	3188	<b>2336</b>
TagumLongford College, Inc.	13	0	<b>13</b>
The Leores Training Academy, Inc.	31	0	<b>-31</b>
TagumLongford College, Inc.	0	291	<b>291</b>
The Philippine Center for Innovative Training and Education, Inc.	297	51	<b>-246</b>
University of Mindanao, Inc. - Tagum Branch	0	8	<b>8</b>
University of Mindanao, Inc. - Peñaplata Branch	11	146	<b>135</b>
University of Mindanao, Inc. - Panabo Branch	6	17	<b>11</b>
Valiant Technical Institute and Assessment Center, Inc.	257	230	<b>-27</b>
Ventura College of Natural Therapeutic Health & Sciences, Inc.	17	42	<b>25</b>
White Lamp School, Inc.	123	51	<b>-72</b>
<b>Total</b>	<b>6,723</b>	<b>11,366</b>	<b>4,643</b>

Source: TESDA, Davao del Norte

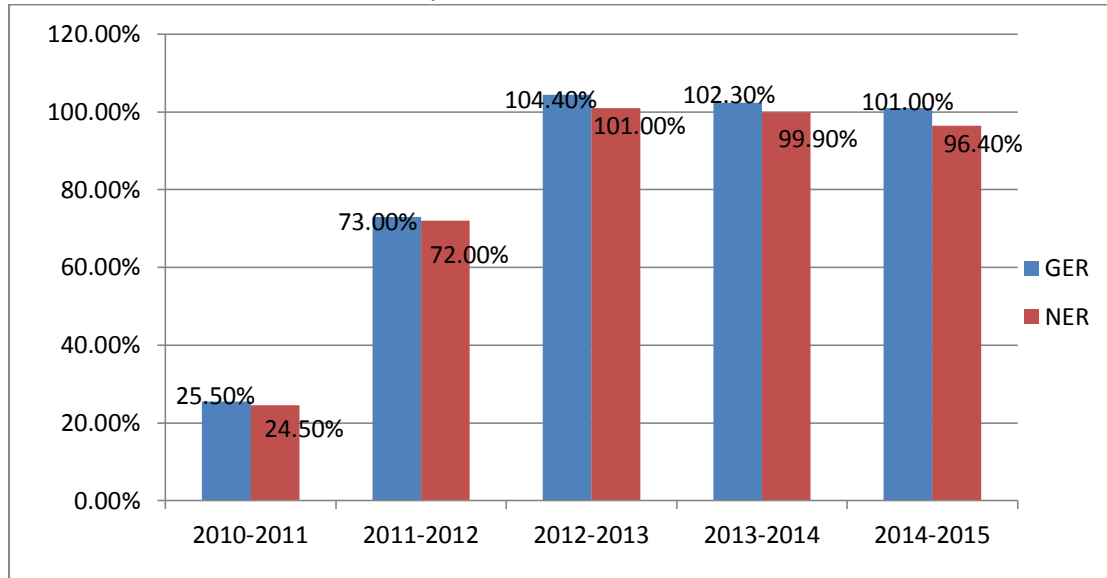
## **b. Access**

To ensure that children have equitable access to free and compulsory primary education of good quality, Gross and Net enrollment Rate are the indicators chiefly used to gauge the development on how accessible education in our province.

### **1. Gross Enrolment Rate (GER) and Net Enrolment Rate (NER)**

Gross enrolment rate is the total enrolment in a given level of education as a percentage of the population while net enrolment rate is the ratio of the enrolment for the school age to the population of the same age group in a given year. The official school age is 6-11 for elementary and 12-15 for secondary.

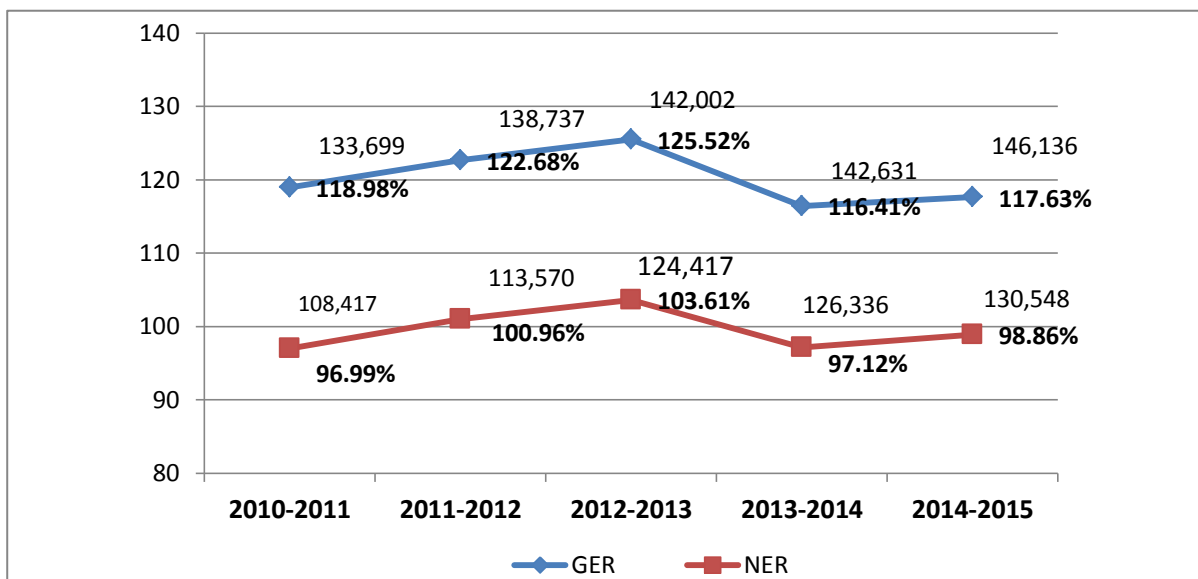
**Figure No. 31 : Gross and Net Enrolment Rate for Kindergarten  
Davao del Norte, SY 2010-11 to SY 2014-15**



Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

Gross Enrolment and Net Enrolment Rates for Kindergarten shown in Figure No. 31 has been fluctuating since SY. 2010-2011 to SY. 2014-2015. A huge average increase in GER (39.45%) and NER (38.25%) was noted from S.Y 2010-2011 to 2012-2013, while a slight decrease in GER and NER from SY. 2013-2014 to 2014-2015 was also observed. Despite the slight decrease in the latter school years, still it can be noted that enrolment surge was due to the universalization of the preschool program in SY. 2011-2012. This indicates that the province is nearing towards the attainment of its goal in providing pre-school education for all based on United Nation Millenium Development Goals (UNMDGs) mantra on education.

**Figure No. 32: Gross Enrolment Ratio and Net Enrolment Ratio (NER) - Elementary  
Davao del Norte, SY 2010-2011 to 2014-2015**



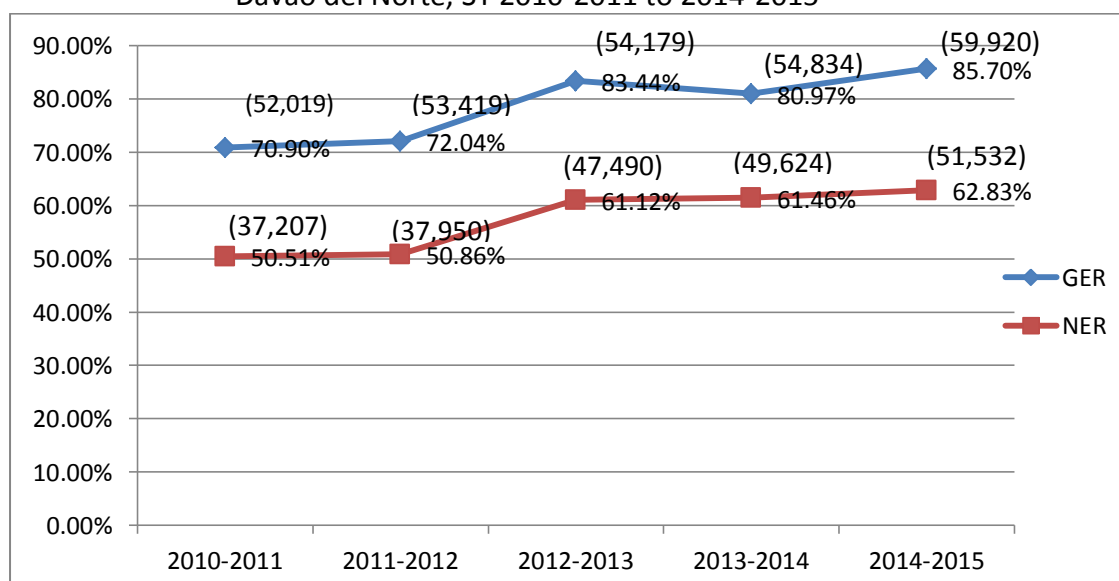
**Table No. 3-163 : Gross Enrolment Ratio and Net Enrolment Ratio (NER) - Elementary  
Davao del Norte, SY 2010-2011 to 2014-2015**

	2014-2015		2013-2014		2012-2013		2011-2012		2010-2011	
	GER	NER	GER	NER	GER	NER	GER	NER	GER	NER
Davao del Norte	115.85%	94.27%	114.79%	93.26%	122.77%	98.73%	128.26%	103.69%	119.44%	95.75%
Panabo City	120.04%	101.48%	119.52%	100.82%	126.81%	106.45%	130.99%	109.35%	127.50%	105.62%
Tagum City	119.50%	102.86%	121.18%	102.46%	124.77%	104.40%	112.02%	92.32%	111.86%	90.96%
Island Garden City of Samal	115.11%	96.82%	110.13%	91.93%	127.72%	104.85%	119.44%	98.50%	117.11%	95.64%
<b>Total</b>	<b>117.63%</b>	<b>98.86%</b>	<b>116.41%</b>	<b>97.12%</b>	<b>125.52%</b>	<b>103.61%</b>	<b>122.68%</b>	<b>100.96%</b>	<b>118.98%</b>	<b>96.99%</b>

Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

Reflected in Figure No. 32 is the fluctuating trend in Gross and Net enrolment rates for Elementary for five consecutive school years, from SY. 2010-2011 to SY. 2014-2015. The situation merits a closer look that although the trend is fluctuating, GER registered an average point of 20.74% for five consecutive school years while there remained 1.14% in NER for S.Y 2014-2015 who did not enter to school at the right age. This has implications to universalization of basic education because children who are over aged are prone to dropping out of school. Meanwhile, the four divisions comprising the province of Davao del Norte are not at par in reaching the goal for education for all.

**Figure No. 33 : Gross Enrolment Ratio and Net Enrolment Ratio (NER) - Secondary  
Davao del Norte, SY 2010-2011 to 2014-2015**



Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

**Table No. 3-164 : Gross Enrolment Ratio *and* Net Enrolment Ratio (NER) - Secondary  
Davao del Norte, SY 2010-2011 to 2014-2015**

Division	2014-2015		2013-2014		2012-2013		2011-2012		2010-2011	
	GER	NER	GER	NER	GER	NER	GER	NER	GER	NER
Davao del Norte	72.08%	50.64%	67.85%	49.70%	71.00%	50.17%	64.89%	46.00%	62.23%	43.36%
Panabo City	92.31%	69.76%	85.85%	65.02%	87.74%	65.38%	73.99%	52.17%	72.60%	56.37%
Tagum City	93.63%	69.39%	92.13%	71.09%	89.33%	68.52%	72.77%	53.09%	72.48%	53.57%
Island Garden City of Samal	84.76%	61.53%	78.04%	60.01%	85.70%	60.43%	76.54%	52.18%	76.29%	48.75%
<b>Ave.</b>	<b>85.70%</b>	<b>62.83%</b>	<b>80.97%</b>	<b>61.46%</b>	<b>83.44%</b>	<b>61.12%</b>	<b>72.04%</b>	<b>50.86%</b>	<b>70.90%</b>	<b>50.51%</b>

Source: Deped Division Planning Offices: Tagum, Panabo, IGACOS and Davao del Norte

A closer examination of the GER and NER in secondary level which is the main indicator for universal basic education goals in EFA is shown in Figure No. 33. The increasing trend of GER has been registered from SY 2010-2011 to 2012-2013 and a slight decrease in SY 2013-2014. On the other hand, the NER has been increasing from SY 2010-2011 to 2014-2015. Though increasing in NER, but there are 37.17% students who did not enter to school at the right age based on the population of the school aged (12-15 years old) in secondary. This means that all Divisions comprising Davao del Norte have fall short in capturing the participation of the students both over aged (GROSS) and school aged 12-15 (NET). It simply indicates that Davao del Norte Province is still far in reaching its goal on “Education for All.”

Once the students are in school, the next step for the administration is how to keep these students intact and engaged so that students are able to acquire the essential skills based on competencies in the curriculum. Internal efficiency of the school can be gauged on how the school keeps the students leaving before completing a particular level. These indicators include completion rate, cohort survival, graduation, retention and dropout rate summarized in Table No. 3-165 and 3-166, respectively.

**Table No. 3-165 : Summary of Performance Indicators, Public Elementary  
Davao del Norte, SY 2010-2011 to 2014-2015**

Indicators	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Completion Rate	72.36%	72.26%	80.31%	79.71%	93.06%
Cohort Survival Rate	79.77%	81.19%	85.75%	87.52%	96.06%
Graduation Rate	98.60%	96.26%	97.43%	101.24%	No Data
Retention Rate	91.72%	92.04%	99.99%	95.04%	No Data
Dropout Rate	0.97%	0.96%	0.75%	0.48%	No Data

Source: Deped Division Planning Offices: Tagum, Panabo, IGACOS and Davao del Norte

Closer look of the different performance indicators for five consecutive years from S.Y 2010-2011 to SY 2014-2015 has been increasing. It revealed that cohort survival has a desirable increasing pattern. About 3.94% of the pupils who do not reached sixth grade. The increase of completion, retention, graduation and cohort survival is a positive



manifestation that schools have strengthened its holding capacity to retain and produce graduates. The increase of performance over the last five(5) years was attributed to some interventions made by the government such Drop-out Rate Reduction Program (DORP), Pantawid Pamilyang Pilipino Program or the 4Ps' and other schools' initiative. Meanwhile, each division is currently conducting researches to address this concern.

**Table No. 3-166 : Summary of Performance Indicators, Public Secondary  
Province of Davao del Norte, 2012 – 2014**

<b>Indicators</b>	<b>2010-2011</b>	<b>2011-2012</b>	<b>2012-2013</b>	<b>2013-2014</b>	<b>2014-2015</b>
Completion Rate	72.29%	67.33%	69.56%	76.86%	No Data
Cohort Survival Rate	77.35%	73.75%	75.17%	79.62%	No Data
Graduation Rate	No Data	No Data	95.34%	98.91%	No Data
Retention Rate	90.34%	89.10%	108.92%	91.03%	No Data
Dropout Rate	3.88%	3.39%	2.15%	0.89%	No Data

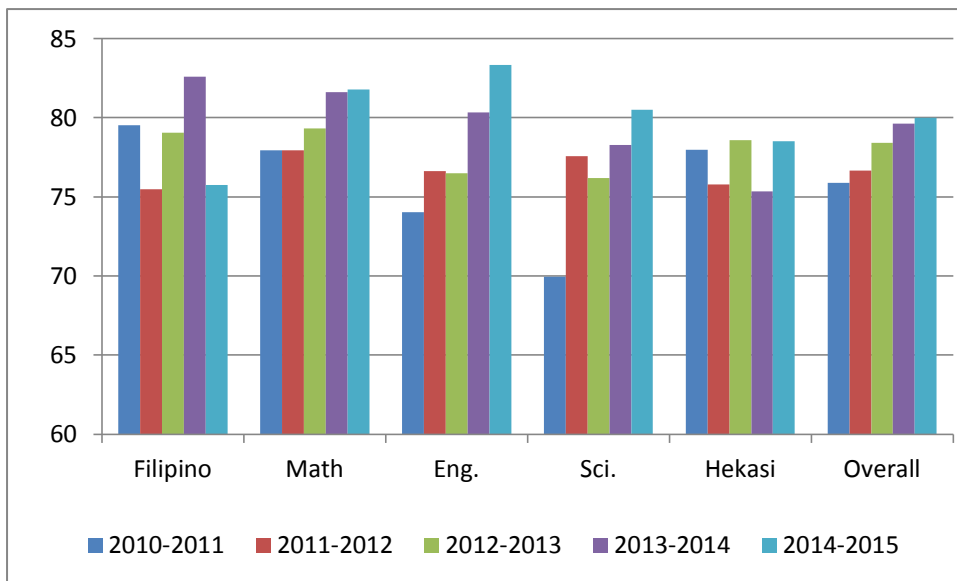
*Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS*

The public secondary schools internal efficiency has been improving over the last five (5) years. The four performance indicators (completion, graduation, retention and cohort survival rates) are inversely proportional to dropout rate. However, for SY 2013-2014, there were 20.22% of the students who did not complete their four years of high school. This can be explained that as the age cohort increases, the need to look for work and the high cost of education are the reasons for not going to school while the significant decreasing trend in dropout rate is attributed to some interventions strengthened by the Department of Education such as School-Based Feeding Program (SBFP), adoption and implementation of Drop-Out Rate Reduction Program (DORP), Alternative Delivery Modalities (ADMs') and Conditional Cash Transfer Programs. With these programs introduced down the lines, the schools' internal capacity to hold/keep the students in school is now addressed regardless of what kind of modalities the school imposed.

## **2. National Achievement Test (NAT)**

The National Achievement Test (NAT) is a Philippine-made standardized test designed to gauge the schools effectiveness based on pupils/students' achievement level in five key curricular subject areas at the end of the school year, administered to Grade VI.

The five-year comparative results and the of the National Achievement Test as shown in Figure No. 34 has an increasing over all Mean Percentage Score (MPS) beating the national target, 75% MPS. Over the years, they performed best in Filipino in contrast with the remaining subjects: Math, Science, Hekasi and English. Recently, the examinees showed marked increase in English; while slightly improved performance in Science. However, there is a remarkable decrease in Filipino.



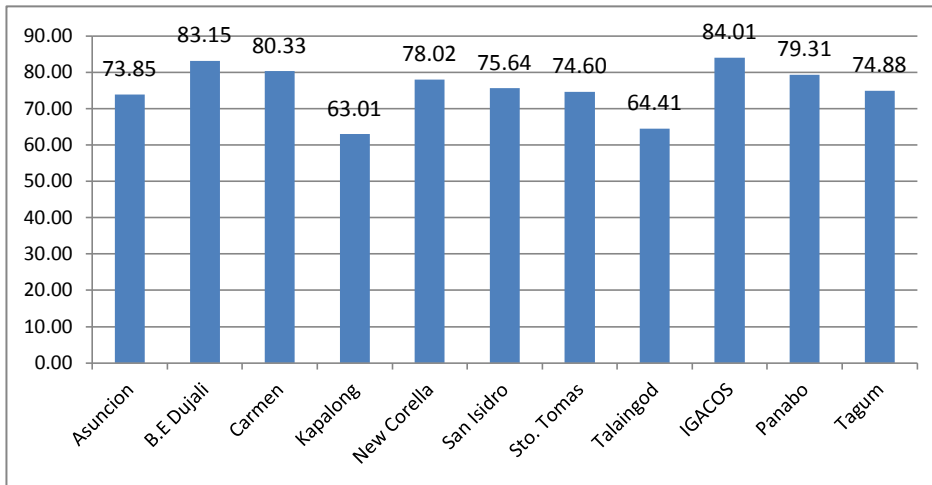
**Table No. 3-167 : National Achievement Test Performance, Elementary Level, Grade 6 Davao del Norte, SY 2010-2015**

School Year	Filipino	Math	English	Science	Hekasi	Overall
2010-2011	79.51	77.95	74.03	69.96	77.97	75.88
2011-2012	75.47	77.94	76.62	77.56	75.77	76.67
2012-2013	79.04	79.31	76.5	76.18	78.59	78.41
2013-2014	82.59	81.62	80.33	78.28	75.34	79.63
2014-2015	75.76	81.79	83.32	80.51	78.51	79.98

Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

The five - year average NAT Performance of the cities and municipalities is displayed in Figure No. 35 shows that Island Garden City of Samal (IgaCoS), B.E Dujali, Carmen, Panabo, New Corella and San Isidro have reached over the National target of 75% while Talaingod and Kapitalong have registered farthest from the National Target. It was also shown that IGACOS was better than the rest of the cities and municipalities. On categorical performance, the categorical classification of the three cities (IGACOS, Panabo, Tagum) and six municipalities (B.E Dujali, Carmen, New Corella, San, Isidro, Sto. Tomas & Asuncion) are moving towards the mastery level while the two municipalities (Talaingod & Kapitalong) categorized as average performing. Some factors can be considered of being average performance is the LGU support of the implementation of some DepEd programs initiated by the Districts and schools.

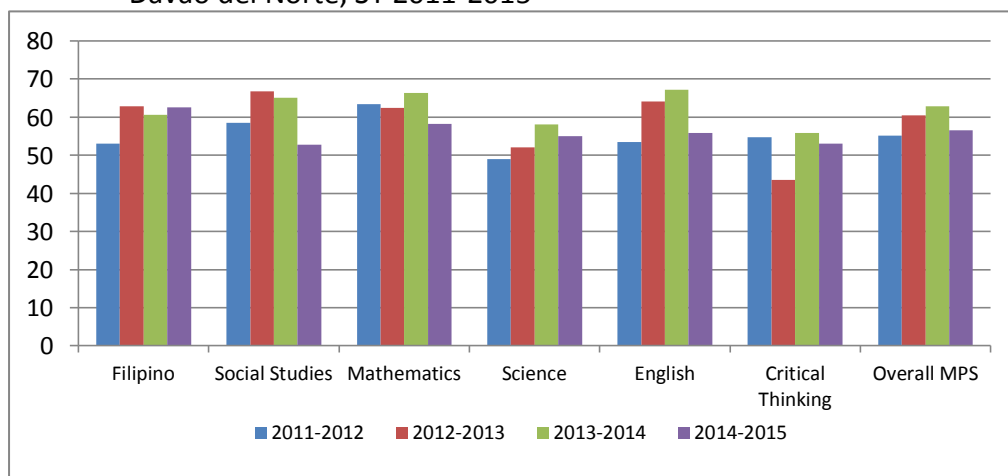
**Figure No. 35 : National Achievement Test Average Performance per City/Municipality ( Five-year performance), Elementary Level, Grade 6 Davao del Norte, SY 2010-2015**



Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

In SY 2011-2015, the NAT subtests of Secondary, Year 4 was shown in the figure below. The performance of Fourth Year examinees in the recent NAT (MPS of 56.60) decreased drastically against the previous year’s performance (MPS of 62.80). Over the years, they performed best in Mathematics (62.60) in contrast with the remaining subjects: Social Studies (60.80), English (60.10), Filipino (59.8), Science (53.60), and Critical Thinking (51.80). In the recent NAT, the examinees showed an increase in Filipino; while decreased performance in all other subjects. On the average for the past four years, the fourth year students obtained an MPS of 58.80 which is described as Average halfway to Mastered. The decrease of performance proved that schools proved less effort. Socioeconomic status is one of the most researched and debated factor among educational professionals that contribute towards the academic performance of students. The most prevalent argument is that the socioeconomic status of learners affects the quality of their academic performance which has negative connotation because the learners basic needs remain unfulfilled hence, they do not perform better academically. Fig. No. 36 & Table No. 3-168.

**Figure No. 36 : National Achievement Test Performance, Secondary Level, Year 4 Davao del Norte, SY 2011-2015**



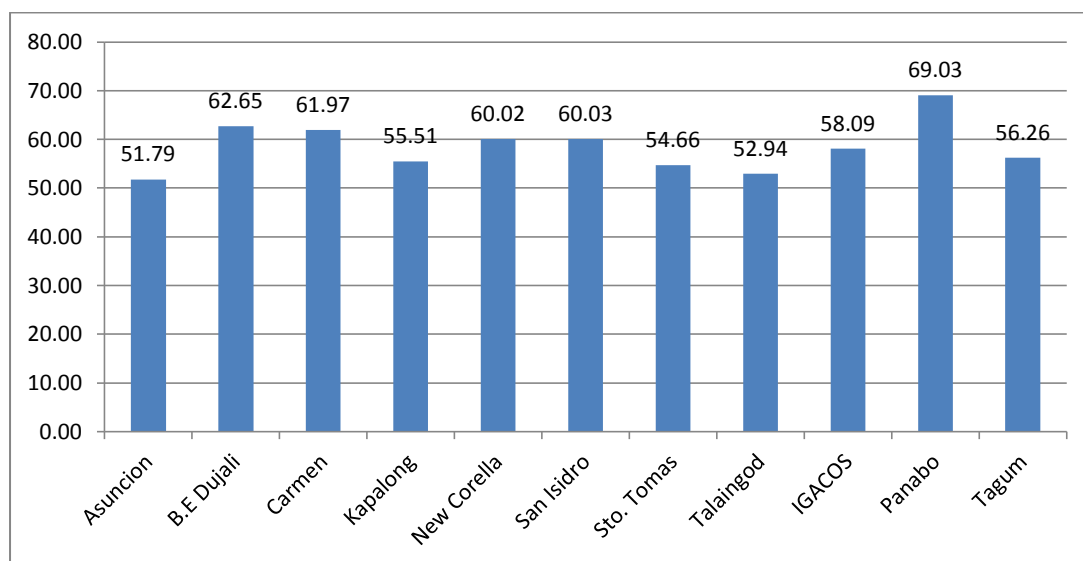
**Table No. 3-168 : National Achievement Test Performance, Secondary Level, Year 4  
Davao del Norte, SY 2011-2015**

School Year	Filipino	Social Studies	Math	Science	English	Critical Thinking	Overall MPS
2011-2012	53.1	58.5	63.4	49	53.4	54.7	55.2
2012-2013	62.8	66.8	62.4	52.1	64.1	43.5	60.5
2013-2014	60.6	65.1	66.3	58.1	67.2	55.8	62.8
2014-2015	62.5	52.7	58.2	55	55.8	53.1	56.6
<b>Average</b>	<b>59.8</b>	<b>60.8</b>	<b>62.6</b>	<b>53.6</b>	<b>60.1</b>	<b>51.8</b>	<b>58.8</b>

Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

The figure below showed the average NAT performance of the three cities and eight municipalities in SY 2011-2015 in secondary level. Among the cities and municipalities comprises Davao del Norte, Panabo City with 69.03 MPS was the nearest to the National target of 75% while the municipality of Asuncion is the farthest. In consonance with DepEd’s descriptive equivalent, only Panabo City categorically described as moving towards the Mastery Level (range: 65%-85%) while the rest are described as average performance level (range: 35%-65%). Results have implications that each municipality/city should strengthen its support towards the implementation of the different DepEd programs relating to the improvement of quality performance be it in a nationally or locally initiated initiatives because the province is still at par in reaching the national target, 75%.

**Figure No. 37 : National Achievement Test Average Performance  
Per City/Municipality (Four-year performance), Secondary Level, Year 4  
Davao del Norte, SY 2011-2015**



Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS

Table No. 3-169 presents the comparative performance for elementary level of the 10 Schools Divisions of Region XI in SY 2014-2015. Analyzing the subtests per Division, each Division has excelled in different subtests but most of the Divisions got the highest Mean Percentage Score (MPS) in Mathematics in contrast with the other subjects. However, in most of the Divisions, Filipino has marked up the lowest MPS. On the average MPS of the recent NAT, IGACOS Division ranked number 1, Panabo City ranked 4, Tagum City ranked 5 and Davao del Norte ranked 8 while Davao City placed at the bottom. Categorically, the performance of the three Divisions (IGACOS, Panabo and Tagum) was described as moving towards the Mastery Level while Davao del Norte Division classified as average performing. With this trend, each division has continuously strengthened its effort in improving its NAT performance as targeted in their respective Division Educational Development Plan (DEDP).

**Table No. 3-169: Mean Percentage Scores per Schools Divisions by Subject Area,  
Elementary Level  
Region XI, SY 2014-2015**

Division	FILIPINO	MATH	ENGLISH	SCIENCE	ARALING PANLIPUNAN	OVERALL MPS	Rank
Island Garden City Of Samal	78.34	90.20	88.73	82.53	85.38	85.04	1
Digos City	80.79	87.52	86.14	86.10	81.42	84.39	2
Davao Del Sur	77.27	86.23	85.07	83.71	84.05	83.27	3
Panabo City	78.05	84.72	86.11	85.77	80.72	83.07	4
Tagum City	75.33	75.32	82.04	80.11	74.31	77.42	5
Mati City	73.69	79.42	79.33	76.96	76.86	77.25	6
Davao Oriental	70.90	78.44	77.12	74.34	74.84	75.13	7
Davao Del Norte	71.28	76.93	76.41	73.62	73.64	74.38	8
Compostela Valley	72.37	75.93	77.26	72.78	73.32	74.33	9
Davao City	65.74	61.21	67.19	63.35	59.04	63.31	10

Source: Deped Regional Office XI

Table No. 3-170 showed the Division MPs increment/decrement in SY 2013-2015. It showed that IGACOS (1.42) and Panabo (0.71) have positive performance compared to Tagum City (-0.20) and Davao del Norte (-0.55) registered a slight decrease in MPS. With this trend, each Division of Davao del Norte continues to monitor its measures and interventions on how to increase the performance of the students in the NAT. Research will also be conducted to determine what specific interventions will be made with this concern.



*Table No. 3-170 : Mean Percentage Score (MPS)– Elementary Level by Division  
Region XI, 2013-2015*

Division	Division MPS		Increment
	2013-2014	2014-2015	
Compostela Valley	76.98	74.33	-2.65
Davao City	65.70	63.31	-2.39
<b>Davao Del Norte</b>	<b>74.92</b>	<b>74.38</b>	<b>-0.55</b>
Davao Del Sur	84.33	83.27	-1.07
Davao Oriental	71.25	75.13	3.88
Digos City	80.63	84.39	3.76
<b>Island Garden City Of Samal</b>	<b>83.61</b>	<b>85.04</b>	<b>1.42</b>
Mati City	77.51	77.25	-0.25
<b>Panabo City</b>	<b>82.36</b>	<b>83.07</b>	<b>0.71</b>
<b>Tagum City</b>	<b>77.63</b>	<b>77.42</b>	<b>-0.20</b>
Average MPS Region XI	77.49	77.76	0.27
Target	75.00	75.00	

*Source: Deped Regional Office XI*

Table No. 3-171 presents the comparative performance of the ten (10) Schools Divisions of Region XI in recent National Achievement Test, SY 2014-2015. It showed that most of the Divisions performed well in Filipino in contrast with the remaining of the subtests while Critical Thinking Skills got the lowest MPS all throughout the region. Notably, each Division's performance settled only to average performance which is far behind the national target, 75%. This indicates that a lot of catching up is needed in almost all subjects particularly in Critical Thinking Skills. With this, each division is looking forward in finding the right interventions and strategies that all the learning competencies will be discussed timely so as to score high in NAT. The result implied that each Division should double their efforts in delivering quality instructions to the students in order to surpass the national mark. This indicates that four Divisions in the province are still far in attaining quality education in the province.

*Table No. 3-171 : Mean Percentage Scores per Schools Divisions by Subject Area,  
Secondary Level  
Region XI, SY 2014-2015*

Division	Filipino	AP	Math	Science	English	CTST	Overall MPS	Rank
<b>Panabo City</b>	<b>66.28</b>	<b>57.70</b>	<b>67.70</b>	<b>66.93</b>	<b>64.11</b>	<b>62.62</b>	<b>64.32</b>	<b>1</b>
Davao Oriental	62.69	53.96	61.06	59.50	54.39	44.66	57.35	2
<b>Davao Del Norte</b>	<b>61.02</b>	<b>49.45</b>	<b>59.16</b>	<b>55.78</b>	<b>53.29</b>	<b>47.15</b>	<b>55.08</b>	<b>3</b>
Compostela Valley	60.12	54.09	60.42	54.78	49.23	45.38	54.91	4
<b>Tagum City</b>	<b>61.82</b>	<b>52.19</b>	<b>55.34</b>	<b>47.15</b>	<b>53.38</b>	<b>52.75</b>	<b>53.85</b>	<b>5</b>
Davao Del Sur	58.62	51.21	55.89	53.36	51.06	48.17	53.59	6
<b>Island Garden City Of Samal</b>	<b>61.04</b>	<b>50.50</b>	<b>52.36</b>	<b>50.28</b>	<b>51.55</b>	<b>49.82</b>	<b>52.96</b>	<b>7</b>
Mati City	59.42	48.61	52.42	52.44	49.03	49.97	52.23	8

Digos City	59.72	47.57	41.62	47.58	49.74	50.15	49.55	9
Davao City	57.81	46.99	38.07	41.76	43.01	43.72	45.65	10
Average MPS	60.86	51.23	54.40	52.96	51.88	49.44	53.95	

Source: Deped Regional Office XI

The table below shows the performance for each division's increase/decrease from SY 2013-2014 to SY 2014-2015. It shows that Davao del Norte Province's Divisions such Davao del Norte and Panabo City have an increase of 4.05 and 9.08. The increase indicates the positive performance the Division in taking the National Achievement Test. On the other hand, IGACOS Division has experience a slight decrease of -0.48 while Tagum City dramatically dropped to -14.66. This indicates the negative performance of the two Divisions in the National Achievement Test. Results implied that an increase or a decrease in the MPS can be attributed to each Division's intervention or strategy conducted. This data also would tell us that LGU- Davao del Norte should strengthen its full support to each Division so as to achieve quality education in the province.

**Table No. 3-172: Division Mean Percentage Scores increment/decrement per Schools  
Divisions, Secondary Level  
Region XI, SY 2013-2015**

Division	DIVISION MPS		Increment
	2013-2014	2014-2015	
Compostela Valley	<b>55.84</b>	54.91	-0.94
Davao City	56.80	45.65	-11.15
<b>Davao Del Norte</b>	<b>51.02</b>	<b>55.08</b>	<b>4.05</b>
Davao Del Sur	60.96	53.59	-7.37
Davao Oriental	56.53	57.35	0.82
Digos City	57.29	49.55	-7.74
<b>Island Garden City Of Samal</b>	<b>53.44</b>	<b>52.96</b>	<b>-0.48</b>
Mati City	58.73	52.23	-6.50
<b>Panabo City</b>	<b>55.24</b>	<b>64.32</b>	<b>9.08</b>
<b>Tagum City</b>	<b>68.52</b>	<b>53.85</b>	<b>-14.66</b>
Average MPS	57.44	53.95	-3.49

Source: Deped Regional Office XI

As presented in Table No. 3-173 shows the five (5) year comparison, literacy in the province shows irregular trend and an indication that the target of 2% yearly increase was not attained. Illiteracy rate on the other hand, was also increasing though a reduced rate was attained in Calendar Year 2010. Over the years, both literacy and illiteracy has been fluctuating. The inversely relationship of literacy and illiteracy shows that as the illiteracy increases the literacy decreases. In CY 2013, it registered a huge increase to 14% while in CY 2014 it posted a minimal decrease to 2%. Reasons to be considered are more children unable to go to school, and with those in school dropping out. While the fluctuating pattern indicates that some improvements were made in educating the children in the province. Further, it must also be noted that the government has been partially successful

in reducing illiteracy but likewise it also revealed that the government needs to put more efforts in bringing education to sustain the improvements made.

**Table No. 3-173 : Literacy and Illiteracy Rate, by year**  
Davao del Norte, 2010-2014

Calendar Year	Literacy Rate	Illiteracy Rate
2010	96.64	4.02
2011	96.04	3.96
2012	96.23	3.77
2013	86.00	14.00
2014	88.00	12.00

Source: DepEd – Alternative Learning System Unit, Davao del Norte Division, Tagum City, IGACOS and Panabo City.

The Alternative Learning System (ALS) of the Department of Education and the LGUs plays an important role in attaining the goal of “Education for All”. It aims toward the attainment of functional literacy especially the out of school youth, the adult and the indigenous people.

To raise the literacy and numeracy skills of the poor and also to expand access to basic education, ALS education has been established. Notably, from 2010 to 2014, a total of 328 literacy classes were organized with a total enrollment of 4,053, wherein 51.52% or 2,088 were females and 48.48% or 1965 were males. The increase in ALS classes indicates that more out-of school-youth, adult and IP’s were served and captured in the ALS program that makes the program more accessible to marginal sector both OSY and Adult, and IP. Table No. 3-174.

**Table No. 3-174 : Literacy Classes and Enrolment (Alternative Learning System)**  
Davao del Norte, 2010-2014

Calendar Year	No. of Classes	Total	Enrolment			
			Female	%	Male	%
2010	5	64	23	35.94	41	64.06
2011	7	121	46	38.02	75	61.98
2012	7	167	52	31.14	115	68.86
2013	356	5473	2890	52.80	2583	47.20
2014	328	4053	2088	51.52	1965	48.48

Source: DepEd – Alternative Learning System Unit, Divisions of Davao del Norte, Tagum City, Samal and Panabo City

#### 4. Resource Indicators

##### 4.1 Teaching Force

Table Nos. 3-175 and 3-176 show those available teachers at the elementary totaled 5,406 and 1,791 teachers at the secondary level. Teaching force in the province is female dominated having 89% female teachers in the elementary and 76% female teachers in secondary level.

Taking into account the current enrolment (SY 2014-2015) of 153,873 in the elementary and 60,086 in the secondary, the teacher – pupil/ student ratio is placed at 1:29 and 1:34 respectively. This scenario is within the national standard of 1 teacher for every 40 students/ pupils. Data reveal that there seems to be sufficient number of teachers in both levels, but taking into consideration the school to school requirements, there still a need to hire more teachers to fill the gap of the teacher resources in both elementary and secondary. The teacher-resources gap was due to dramatic increase of enrolment to schools' annexes wherein the gap wasn't seen in the reservoir of data- EBEIS because it was incorporated in the mother school.

**Table No. 3-175 : Public Elementary Resource Indicators  
Davao del Norte, CY 2014-2015**

City Municipality	Current Enrolment	Actual Number of Teachers	Teacher Pupil Ratio	Actual No. of Classrooms	Classroom-pupil ratio	Actual no. of Furniture	Furniture Pupil Ratio
Asuncion	10428	454	23	220	47	5989	1.48
B.E Dujali	3847	183	21	98	39	3483	1.41
Carmen	12478	549	23	255	49	9320	1.46
Kapalong	13877	574	24	295	47	7548	1.46
New Corella	9463	433	22	185	51	7095	1.52
San Isidro	5040	232	22	98	51	2929	1.50
Sto. Tomas	19249	849	23	363	53	11663	1.45
Talaingod	5694	203	28	89	64	3990	1.43
IGACOS	17322	454	39	327	53	13554	1:1.3
Panabo City	30159	716	42	618	49	20124	1:50
Tagum City	26042	759	50	659	45	33025	1.30
Total	153,873	5406	29	3207	50	118,720	1.40

Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGA CoS

**Table No. 3-176 : Public Secondary Resource Indicators  
Davao del Norte, CY 2014-2015**

City Municipality	Current Enrolment	Actual Number of Teachers	Teacher Pupil Ratio	Actual No. of Classrooms	Classroom-pupil ratio	Actual no. of Furniture	Furniture Pupil Ratio
Asuncion	3367	100	31	75	45	2864	1.09
B.E Dujali	2038	59	34	44	46	1445	1.36
Carmen	4192	130	31	93	45	4250	1.40
Kapalong	4593	145	29	109	42	3754	1.19
New Corella	3016	86	33	57	53	2394	1.06

San Isidro	1345	40	28	22	61	1165	1.10
Sto. Tomas	6627	182	33	174	38	4423	1.42
Talaingod	934	25	30	22	42	828	0.90
IGACOS	7064	245	1:29	175	40	5,358	1:20
Panabo City	10727	365	29	232	46	8734	1:1.22
Tagum City	16183	414	36.04	281	53	14311	1.04
Davao del Norte-Total	60,086	1791	34	1,287	46	49,526	1.20

*Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGaCoS*

## **4.2 Classrooms**

In 2014, available classrooms in the elementary totaled to 3,207 and 1,287 in the secondary. Classroom – student ratio is computed at 1:50 in the elementary and 1:46 in the secondary. The Provincial Scenario in secondary level is a little bit higher than the national standard of 40 students per classroom. Taking into account the school to school requirements, additional classrooms at the elementary level particularly in Talaingod and at the secondary level in San Isidro is a felt need.

In response to the safety and security of children in calamity, the Divisions of Davao del Norte and Panabo City (No Data available for Tagum City and Samal City) have built a total of 169 risk resilient classrooms for both elementary and secondary level. Thus, this number calls a closer look for an in dire need to build more classrooms resilient to calamities.

## **4.3 Chairs/ Armchairs**

Data reveal additional chairs/armchairs needed in both levels based on data presented in Table Nos. 20 and 21. The shortage of chairs/armchairs is due to failure of bidding where no suppliers participated, thus, resulting to failure to procure for CY 2013-2015.

## **4.4 School Facilities Exposed to Calamities**

### **School Facilities Exposed to Liquefaction**

In Davao del Norte, there are 233 school facilities that are exposed to liquefaction. Of the eight (8) LGUs affected, Kapalong City has 56 school facilities exposed to liquefaction, with 45 elementary schools and 11 high schools affected. And also, the municipality of Kapalong has the most number of elementary schools and high schools with highly susceptible area (HSA) exposure to liquefaction. Tagum City has 12 day care centers with HSA exposure to liquefaction. Table No. 3-177.



*Table No. 3-177 : School Facilities Exposed to Liquefaction  
Davao del Norte, CY 2013*

City/ Municipality	Health Facility	No. Exposed	Haz Code
Asuncion	Elementary School	8	HSA
B.E. Dujali	Elementary School	2	HSA
	High School	1	HAS
Carmen	Elementary School	3	LSA
	Elementary School	15	HSA
	High School	1	LSA
	High School	6	HSA
Kapalong	Elementary School	15	LSA
	Elementary School	1	MSA
	Elementary School	29	HSA
	High School	3	LSA
	High School	8	HSA
New Corella	Elementary School	27	HSA
	High School	4	HSA
Panabo	Elementary School	4	LSA
	Elementary School	14	MSA
	Elementary School	16	HSA
	High School	1	LSA
	High School	3	MSA
	High School	2	HSA
Sto. Tomas	Elementary School	28	HSA
	High School	9	HSA
Tagum	Day Care Center	12	HSA
	Elementary School	17	HSA
	High School	3	HSA
	Trade School	1	HSA
		<b>233</b>	

### School Facilities Exposed to Ground Shaking

A total of 319 school health facilities are prone to ground shaking. These include the nine (9) cities/municipalities Davao del Norte (Asuncion, Carmen, B.E. Dujali, IGACOS, Kapalong, New Corella, Panabo, Sto. Tomas, and Tagum). The municipality of New Corella has the most number of facilities exposed to ground shaking with 57 PEIS VIII and above and 3 PEIS VII exposed school facilities, 53 of which are elementary schools. Table No. 3-178.

*Table No. 3-178 : School Facilities Exposed to Ground Shaking  
Davao del Norte, CY 2013*

City/ Municipality	Facility	No. of Facilities Exposed	Haz Code
Asuncion	Elementary School	8	PEIS VIII and above
Carmen	Elementary School	30	PEIS VII
	High School	9	PEIS VII

B.E. Dujali	Elementary School	2	PEIS VII
	High School	1	PEIS VII
IGACOS	Elementary School	9	PEIS VI
	Elementary School	37	PEIS VII
	High School	4	PEIS VI
	High School	9	PEIS VII
Kapalong	Elementary School	16	PEIS VII
	Elementary School	29	PEIS VIII and above
	High School	3	PEIS VII
	High School	8	PEIS VIII and above
New Corella	Elementary School	53	PEIS VIII and above
	High School	3	PEIS VII
	High School	4	PEIS VIII and above
Panabo	Elementary School	31	PEIS VII
	High School	5	PEIS VII
Sto. Tomas	Elementary School	23	PEIS VII
	Elementary School	5	PEIS VIII and above
	High School	7	PEIS VII
	High School	2	PEIS VIII and above
Tagum	Elementary School	17	PEIS VIII and above
	High School	4	PEIS VIII and above
		<b>319</b>	

### School facilities exposed to Earthquake Induced Landslide

The province has 7 identified school facilities susceptible to earthquake induced landslide, two (2) are from Kapalong, two (2) from New Corella and three (3) from San Isidro. All are highly susceptible to earthquake induced landslide. Table No. 3-179

**Table No. 3-179 : School Facilities Exposed to Earthquake Induced Landslide**  
Davao del Norte, CY 2013

City/ Municipality	Facility	No. Exposed	Haz Code
Kapalong	Day Care Center	1	HSA
	Elementary School	1	HSA
New Corella	Elementary School	2	HSA
San Isidro	Day Care Center	1	HSA
	Elementary School	2	HSA
		<b>7</b>	

### School facilities exposed to flood

There are 162 school facilities in seven (7) cities/municipalities identified as exposed to flooding. These include 2 day care centers, 127 elementary schools and 33 high schools. The municipality of Sto. Tomas has the most number exposed to flooding with 38 facilities followed by Carmen with 33 facilities and Kapalong with 37 facilities. The city/municipalities of Carmen, Kapalong and Tagum has one (1) each of identified very highly susceptible area (VHSA) to flooding. Table No. 3-180

**Table No. 3-180: School Facilities Exposed to Flood  
Davao del Norte**

City/ Municipality	Health Facility	No. Exposed	Haz Code
Carmen	Elementary School	25	MSA
	Elementary School	1	VHSA
	High School	6	MSA
	High School	1	LSA
B.E. Dujali	Elementary School	2	LSA
	High School	1	LSA
Kapalong	Elementary School	29	HSA
	High School	1	VHSA
	High School	7	HSA
New Corella	Elementary School	24	MSA
	Elementary School	2	HSA
	High School	2	MSA
	High School	1	HSA
Panabo	Elementary School	10	LSA
	Elementary School	3	MSA
	High School	3	LSA
Sto. Tomas	Elementary School	20	MSA
	Elementary School	8	HSA
	High School	1	LSA
	High School	4	MSA
	High School	5	HSA
Tagum	Day Care Center	2	HSA
	Elementary School	2	HSA
	Elementary School	1	VHSA
	High School	1	HSA
		<b>162</b>	

**School Facilities exposed to Storm Surge**

Table No. 3-181 reveals that there are twenty-one (21) school facilities in four coastal cities/municipalities of Davao del Norte exposed to storm surge. The facilities which are at greater risk to storm surges are found in IGACOS, Panabo City and Tagum City with Var code ranging from 2 to 3. The city of Panabo has eight (8) elementary school facilities that are exposed to storm surge with var code of 3 or with high exposure to storm surge.

**Table No. 3-181 : School Facilities Exposed to Storm Surge  
Davao del Norte**

City/ Municipality	School Facility	No. of facilities exposed	Var Code
Carmen	Elementary School	1	2
IGACOS	Elementary School	1	2
	Elementary School	3	3
Panabo	Elementary School	1	2
	Elementary School	8	3
	High School	2	3

Tagum	Day Care Center	1	1
	Day Care Center	1	2
	Day Care Center	1	3
	Elementary School	1	2
	High School	1	2
		<b>21</b>	

#### 4.5 Sports Development

Youth and sports development program in Davao del Norte through the construction of the Davao del Norte Sports and Tourism Complex endeavors to provide sustainable scientific base training to all Dabaonon athletes. Since its establishment in 2012, it increased the activities of grassroot trainings and exposure of athletes to higher athletic undertakings such as Palarong Pambansa, Regional Batang Pinoy, National Batang Pinoy and other elite games sponsored by private organizations.

Sports have been integrated in the development of the province and in different special sectors. One sport program for the IPs, ten (10) provincial sports associations were organized and ten (10) sports clinic were conducted.

Table No. 3-182 shows the standing of Davao del Norte divisions (Davao del Norte, IGACOS, Panabo City and Tagum City) in the Davao Region Athletic Association (DAVRAA) meet in 5-year period. In 2015, Panabo City and Tagum City divisions got the third and second rank, respectively.

**Table No. 3-182: Performance of different divisions in DAVRAA, 2011-2015  
Davao del Norte, 2011-2015**

Division	2011	2012	2013	2014	2015
COMVAL	2 <sup>nd</sup>	2 <sup>nd</sup>	5 <sup>th</sup>	9 <sup>th</sup>	7 <sup>th</sup>
Davao City	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>	1 <sup>st</sup>
Davao del Sur	3 <sup>rd</sup>	3 <sup>rd</sup>	3 <sup>rd</sup>	5 <sup>th</sup>	5 <sup>th</sup>
Davao Oriental	6 <sup>th</sup>	5 <sup>th</sup>	8 <sup>th</sup>	8 <sup>th</sup>	8 <sup>th</sup>
Mati City	-	-	9 <sup>th</sup>	6 <sup>th</sup>	9 <sup>th</sup>
Digos City	7 <sup>th</sup>	8 <sup>th</sup>	7 <sup>th</sup>	4 <sup>th</sup>	4 <sup>th</sup>
Davao del Norte	4 <sup>th</sup>	4 <sup>th</sup>	4 <sup>th</sup>	7 <sup>th</sup>	6 <sup>th</sup>
IGACOS	9 <sup>th</sup>	9 <sup>th</sup>	10 <sup>th</sup>	10 <sup>th</sup>	10 <sup>th</sup>
Panabo City	5 <sup>th</sup>	6 <sup>th</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	2 <sup>nd</sup>
Tagum City	5 <sup>th</sup>	7 <sup>th</sup>	6 <sup>th</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>

Source: Sports Division, PGO

Table No. 3-183 reflects the 5 year standing of DAVRAA in Palarong Pambansa. It demonstrates a fluctuating performance from 7<sup>th</sup> place in 2011 to 9<sup>th</sup> place in 2015.

During the recent 2015 Palarong Pambansa held in Davao del Norte, the province garnered 9<sup>th</sup> in the over-all national standing, 9<sup>th</sup> in the elementary category and 8<sup>th</sup> in the secondary category.

**Table No. 3-183 : Comparative Standing of DAVRAA in Palarong Pambansa  
Davao del Norte, 2015**

Year	Venue	Elem	Sec	Over-All
2011	Dapitan	8 <sup>th</sup>	5 <sup>th</sup>	7 <sup>th</sup>
2012	Pangasinan	10 <sup>th</sup>	10 <sup>th</sup>	10 <sup>th</sup>
2013	Dumaguete	11 <sup>th</sup>	10 <sup>th</sup>	11 <sup>th</sup>
2014	Laguna	8 <sup>th</sup>	11 <sup>th</sup>	8 <sup>th</sup>
2015	Davao del Norte	9 <sup>th</sup>	8 <sup>th</sup>	9 <sup>th</sup>

Source: Sports Division, PGO

Through the establishment and operationalization of the DavNor Sports Academy it is likely that over-all performance of athletes in regional, national and international competitions be improved.

#### 4.6 Schools as Evacuation Shelters

Schools are oftentimes used as evacuation centers. For whatever reason, whether it is due to natural calamities such as typhoons or floodings, or as a result of accidents such as fires, schools have traditionally been used to serve as evacuation centers for displaced victims. It is because it can accommodate large number of people. It is strategically located. Schools can offer good shelter and protection. They have the most basic amenities for personal necessities. And they are accessible for the delivery of aid and other needs required.

In the Province of Davao del Norte's eight (8) municipalities, all of which are likely to experience calamity. Hence, each Municipal DRRM Office determined the location of evacuation centers in their respective areas.

A total of 38 Elementary Schools, 18 Daycare Centers, and 18 Secondary Schools were designated as temporary shelters. Table No. 3-184.

**Table No. 3-184 : Schools Identified as Evacuation Shelters  
Davao del Norte, CY 2014**

Municipality/District	Barangay	Evacuation Center
<i>(Source: Municipal Disaster Risk Reduction and Management Council of Carmen)</i>	Anibongan	Anibongan Elementary School Anibongan National High School
	Ising	Day Care Center
	Maniki	Maniki Central Elem. School Gym



<p>Kapalong <i>(Source:Municipal Disaster Risk Reduction and Management Council of Kapalong)</i></p>	Pag-asa	Pag-asa Elem. School Luna Elem. School
	Sampao	Samapo Elem. School
	Gabuyan	Day Care Center
	Tiburcia	Tiburcia Elem. School
	Mabantao	Mabanatao National High School
	Sua-on	Public Schools in every sitios: Sambayon Primary School Sua-on Elem. School Sua-on National High School
<p>Braulio E. Dujali <i>(Source:Municipal Disaster Risk Reduction and Management Council of B.E. Dujali)</i></p>	Magupising	Lower Magupising Day Care Center Magupising Elem. School Upper Magupising Daycare Center East Cabay-angan Elem. School East Cabay-angan Daycare School Cabay-angan National High School
	Tanglaw	Tanglaw National High School Tanglaw Elementary School Tanglaw Townsite Daycare Center Tanglaw 1 Daycare Center
	Cabay-angan	East Cabay-angan Elementary School East Cabay-angan Daycare Center Cabay-angan National High School East Cabay-angan Elem. Mini Gym Cabay-angan Elem. School Cabay-angan Daycare Center Balisong Elem. School Balisong Daycare Center
	Dujali	Dujali Poblacion Daycare Center Dujali Central Elementary School Bugtong Talisay Elementary School Bugtong Talisay Daycare Center Bacale Elementary School Bacale Daycare Center Purok 8, D-6 Daycare Center Pawas Daycare Center
	New Casay	New Casay Elementary School New Casay Daycare Center
<p>Sto. Tomas <i>(Source:Municipal Disaster Risk Reduction and Management Council of Sto. Tomas)</i></p>	Tibal-og	Sto. Tomas Central Elem. School Covered Court Sto. Tomas Central Elem. School Classrooms Sto. Tomas National High School Covered Court Sto. Tomas National High School Classrooms
	New Katipunan	New Katipunan Elem. School Classrooms
	Kimamon	Kimamon Elem. School Classrooms Kimamon High School Classrooms Kimamon High School
	Pantaron	Pantaron Elem. School Classrooms
	San Vicente	San Vicente Elem. School Classrooms
	Salvacion	Salvacion High School Buildings Salvacion Elem. School Buildings

	La Libertad	La Libertad High School Buildings La Libertad Elem. School Buildings
	NAFCO, Tibal-og	NAFCO Elem. School Buildings
	Tulalian	Tulalian High School Buildings
	Balagunan	Balagunan Elem. School Buildings Balagunan High School Buildings
	Bobongon	Bobongon Elem. School Buildings
	New Visayas	New Visayas Elem. School S Buildings
	Magwawa	Magwawa Elem. School Buildings
Asuncion <i>(Source:Shelter, Food and Non-Food Sector, Davao del Norte)</i>	Camansa	Camansa Elementary School Day Care Center
	Cambanogoy	Cambanogoy Elementary School
	Canatan	Day Care Center
	Sagayen	Sagayen National High School
Sonlon	Sonlon	Sonlon Elementary School Sonlon National High School
Talaingod <i>(Source:Shelter, Food and Non-Food Sector, Davao del Norte)</i>	Sto. Nino	Sto. Nino National High School Sto. Nino Central Elementary School
New Corella <i>(Source:Shelter, Food and Non-Food Sector, Davao del Norte)</i>	Dagohoy	Dagohoy National High School
	New Corella	New Corella National High School
	Mesaoy	Mesaoy National High School Mesaoy Elementary School
	Macgum	Macgum Elementary School
	Sta. Cruz	Sta. Cruz Elementary School
	Del Pilar	Del Pilar Elementary School
Island Garden City of Samal	Babak	Angel Villarica Central Elem. School
	Samal	San Jose Elem. School
	Samal	Peñaplata Central Elem. School - SPED Center
Panabo City	A.O Floirendo	A. O. Floirendo National High School
	Kauswagan	Kauswagan National High School
	Little Panay	Little Panay National High School
	Manay	Manay Elem. School
		Panabo National High School.
		Quezon High School - Panabo NHS Annex
		San Vicente National High School
	Southern Davao	Southern Davao National High School
		Cabili Elem. School
		Dona Nenita R. Floirendo Elem. School
	Gredu	Gredu Elem. School
		Panabo Central Elem. School
		Rizal Elem. School
		Salvacion Elem. School
		San Francisco Elem. School
		San Vicente Elem. School
		Sto. Nino Elem. School
	A.O. Floirendo	A.O Floirendo Elem. School
		Concordia A. Sison Elem. School
		Dalisay Village Elem. School
	Don Manuel A. Javellana Memorial School	
Nanyo	Nanyo Central Elem. School	
	P. Changco Elem. School	

		Rodrigo D. Mabitad Sr. Elem. School
		Roxas Elem. School
	Southern Davao	Southern Davao Elem. School
		Valentin N. Daquio Elem. School
		Buenavista Elem. School
		Consolacion Elem. School
	Datu Abdul	Datu Abdul Elem. School
		Glecerio L. Dondoy Central Elem. School
		Kasilak Elem. School
		Katipunan Elem. School
	Kiotoy	Kiotoy Elem. School
Panabo City		Licanan Elem. School
	Little Panay	Little Panay Elem. School
	Mabunao	Mabunao Elem. School
	Malativas	Malativas Elem. School
		Namuag Elem. School
		Narciso B. Galapin Elem. School
	New Visayas	New Visayas Elementary School
		San Roque Elem. School
		Sta. Cruz Elem. School
	Tagpore	Tagpore Elem. School
		Tagurot Elem. School
Tagum City		Teofanis G. Gerona, Sr. Elem. School
	San Miguel	Laureta National High School
	San Miguel	Laureta Elementary School
	Magdum	Luis Lina Elementary School
	Mankilam	Mankilam Elementary School

Source: DepEd – Divisions of Davao del Norte, Tagum City, Panabo City and IGA CoS

The utilization of schools as shelter for displaced families during calamities is not a bad idea. However, this has affected the regular conduct of classes and even suspension of classes that compromise the quality of education of school children. Hence, there is a need to limit the use of schools as evacuation centers and identify safe alternate evacuation sites such as: gym, sports and cultural centers, barangay halls and other safe places. Local government units need to give priority legislation and funding for the establishment and construction of permanent evacuation centers.

### **ISSUES AND CONCERNS AND UNDERLYING POSSIBLE CAUSES**

1. Now on its 5<sup>th</sup> year to K to 12 implementation, the challenge grappling the delivery of quality instructions is the inadequacies of classrooms and teachers where the department gradually addresses every concern beset before the K to 12's full blown implementation. Thus, construction of school buildings and hiring of qualified teachers need to be speed up. Moreover, outdated school facilities also need improvement to speed up full implementation of K to 12 program.
2. All divisions in Davao del Norte have fall short in capturing the participation of the students both over aged and school aged which are attributed to low socio economic status, migration, school accessibility and as well as technology

intervention and poor family values. This indicates that the province is far from reaching its goal in “Education for All”.

3. With the fortuitous event experienced by the province brought about by climate change, schools are traditionally used as evacuation centers even on school days. The classes get affected and suspended that compromise the education of school children. The government has to adopt preventive measures through construction of DRRC/SB that conform to school building disaster resilient code and standards.
4. The effect of migration of programs to newly promulgated training regulations and the implementation of the K to 12 program has resulted to low enrolment of school based training programs. Scholarship programs in collaboration with government and private stakeholders need to be facilitated so as not to impede the continuous production of skilled workforce.
5. The quality of competency based TVET delivery of registered programs is affected by the lack of capability to incur additional investment for the equipment, facilities and training of trainers.
6. The construction of the Davao del Norte Sports and Tourism Complex will hopefully address the issue on the unsatisfactory over-all ranking of local athletes in higher sports meet. There is a need of unified scientific training of different sporting events.

**GOALS**

1. To produce globally competitive Dabaonon workforce through quality education for all.
2. To Increase number of risk resilient school buildings/facilities
3. To improve over-all performance of athletes in regional, national and international competitions

**OBJECTIVES**

1. To increase access to education facilities
2. To improve performance indicators in Public Elem./Secondary

	<b>Participation Rate</b>	<b>Survival Rate</b>	<b>Transition Rate</b>	<b>Graduation Rate</b>	<b>Retention Rate</b>
<b>Elementary</b>	100-100%	83-90%	99-100%	100-100%	95-100%
<b>Secondary</b>	54-65%	79-85%	87-92%	99-100%	92-96%

3. To properly identify and construct permanent structure as evacuation center.
4. To make 75 school building/facilities risk-resilient thru Construction and retrofitting repair by 2022.
5. To increase technical education and skills enrollees by 10% in 2016.

6. To sustain the certification rate of 94% of TVET graduates in Davao del Norte by 2016.
7. To provide sustainable scientific base training to all Dabaonon athletes by 2016.

### **STRATEGIES**

1. Maximize support by the LGUs in financing school building programs thru the Special Education Fund
2. Pursue the Adopt-a-School Program, implement and expand mobile classrooms and alternative delivery modes
3. Revisit DepEd policy on the basis of standard classroom and pupil ratios to rationalize shortages vis-à-vis classroom requirements
4. Prioritize school building allocation from politics to ensure strategic allocation of school building projects especially in far-flung and remote areas
5. Strengthen LGU support to DepEd Programs Activities Projects
6. Assess, protect and strengthen critical public facilities, lifelines and physical infrastructure
7. Inventory and recruitment of Out-of-School Youth (OSYs) to enroll in Technical Vocational Education and Training (TVET)
8. TVET trainers are accredited under the National TVET Trainer's Certification (NTTC)
9. Integration of Scientific training/methods in all Sports Development Program

### **PROGRAMS, PROJECTS AND ACTIVITIES**

- Implementation of the School Building Program
- Implementation of the Adopt-a-School Program
- Implementation and expansion of mobile classrooms and alternative delivery modes
- Construction/Upgrading/Improvement of sanitation and water facilities in all schools
- Establishment and operationalization of DavNor Sports Academy.
- Advocacy on Technical Vocational Institutions (TVIs) in migration of programs to newly promulgated TRs
- Provision of scholarship programs of TESDA
- Investment support of LGUs to TVET scholarships
- Advocacy to Technical Vocational Institutions (TVIs) to migrate its programs to the newly promulgated TRs, where industry standards is observed
- Sports Development Program
  - TRAIN Project
  - COMPETE Project
  - HOST Project

#### **7.3.3 Housing**

- a. Assessment of Existing Situation

While housing is an essential component of the nation's economy, the importance of adequate housing become a primordial aspect of people's lives. The need of adequate housing is recognized under the Millennium Development Goals (MDG) which aims to improve the lives of poor people.

Moreover, home ownership is usually the basic way of obtaining adequate housing unit. And this has also become a major form of investment for individuals and households to financial stability and social living condition.

The National Urban Development and Housing Framework (NUDHF) 2009-2016 finds the housing problem to be serious and is a largely urban phenomenon. The magnitude of housing need, defined as the housing backlog plus new households, is enormous and is estimated to reach about 5.8 million housing units in 2016.

In the Province of Davao del Norte, housing units occupied has increased significantly from 147,427 in 2000 to 207,179 in 2010 with an average rate of 4.38% annually this can be attributed to increased number of population. Table No. 3-185

**Table No. 3-185 : Housing Units, Occupied and Vacant by Censal Year  
1970, 1980, 1990, 2000, 2010, Davao del Norte**

Year	No. of Housing units	No. of Occupied Units	% Occupied
1970	42,595	41,827	98.20
1980	75,565	72,443	95.20
1990	109,765	105,442	96.10
2000	147,989	147,427	99.60
2010		207,179	

Source: National Statistics Office, 2000-2010

As per NSO Report in 2010 demand of housing units had more than doubled between year 2000 and 1970 due to increases in populations with an average rate of 4.38%, almost all housing units in 2000 were occupied at 99.6% rate Table No. 3-186

**Table No. 3-186: Comparison of Occupied Units, Households and Household Populations,  
by type of Building, 2000 and 2010, Davao del Norte**

Type of Building	Occupied Housing Unit		Number of Households		Household population	
	2000	2010	2000	2010	2000	2010
Single House	147,427	207,179	150,844	211,099	742,206	937,785
Duplex	137,809	193,076	140,465	196,590	694,880	881,309
Multi Residential	2,907	5,884	3,055	5,991	14,263	24,086
Comm./Industrial/Agri.	4,644	6,937	5,222	7,211	22,431	27,247
Institutional Living Qts	421	827	444	841	1,865	3,334
Other Housing Units	20	6	20	6	58	20
Not reported	1,589	358	1,601	361	8,578	1,396

Source: National Statistics Office, 2010



Table 3-186 shows Total Occupied housing units increased by 38.50% between 2000 and 2010. Duplex housing units increased by 102% between 2000-2010 more than single houses at 40%. There were 3,514 households in 2010 shared shelter with other households, occupying single houses (196,590-193,076). Household population in all types of housing unit ranges between 4 to 5 persons per unit.

**Table No. 3-187: Household by type of Building Tenure, Status of the Lot, Unit,  
Province of Davao del Norte**

Tenure Status of Housing Unit	Number		Single Houses		Duplex		Multi-Residential	
	2000	2010	2000	2010	2000	2010	2000	2010
Total	150,884	211,099	140,465	196,590	3,055	5,991	5,222	7,211
Owned/being amortized	79,424	126,257	77,486	122,370	976	2,166	735	1,307
Rented	19,723	24,037	16,989	18,654	957	1,898	1,610	3,046
Rent free with owner consent	40,710	51,788	37,531	47,265	823	1,651	2,150	2,501
Rent free without owner consent	7,983	5,242	5,806	4,787	201	122	499	274
Not applicable		38		35		2		1
Not reported								

Source: National Statistics Office, 2010

Table No. 3-187 shows more households construct houses in lots they owned /amortized. Single Houses either duplex or multi-residential types. There we still households constructing houses in lots they do not owned and without consent of the rightful owners could be evicted anytime and maybe considered squatters. Households constructing houses in lots they don't own with and without owner's consent (43,714 in 2000 & 55,525 in 2010) moreover at the rate of 2.70% annually.

**Table No. 3-188: Inventory of Subdivisions and Resettlement  
Province of Davao del Norte: CY 2010**

City/Municipality	No. of Subdivision	No. of Resettlements Sites	No. of Gawad Kalinga Communities
Tagum	75	4	2
Panabo	97	4	1
New Corella	2	-	
Carmen	6	1	1 (pipeline)
Kapalong	2	1	1
Asuncion	3	-	1 (pipeline)
Sto. Tomas	10	-	1 (pipeline)
Talaingod	-	-	
San Isidro	-	-	
B.E. Dujali	-	-	
IGaCos	15	-	1
Total	161	10	

Source: SEP, 2014

According to SEP of 2014 Data Settlements and Subdivision of the province remains to be active as NGO's GO's and Private Sector continue to give their share in expanding in developing housing projects

*Table No. 3-189 : Informal Settlers by Municipality / City  
Davao del Norte, 2014*

City/Municipality	No. of Dwelling Units	No. of Families
Tagum	522	284
Panabo		2,247
New Corella	319	1,129
Carmen	509	515
Kapalong	2,668	2,668
Asuncion	1	
Sto. Tomas	4,155	2,247
Talaingod	180	180
San Isidro		
B.E. Dujali	46	57
IGaCos	3,171	3,074
<b>Total</b>	<b>11,579</b>	<b>14,416</b>

Source : SEP 2014

Table No. 3-189 shows number of informal settlers in the province of Davao del Norte continue to grow significantly due to rising number of population and rural /urban migration due to lack of income opportunities in place of origin.

### **ISSUES AND CONCERNS AND UNDERLYING POSSIBLE CAUSES**

1. According to National Informal Settlements Upgrading Strategy (NISUS) for the Philippines Report the increasing numbers of Informal Settlers Families (ISF) can be attributed to families who live in chronic urban poverty, the occurrence of informal settlements in the Philippines can be traced to low income, unrealistic and inadequate urban planning, lack of serviced land, a dearth in affordable socialized housing, and a dysfunctional legal system.
2. **Most Lgu's has no identified resettlement areas.** Majority of LGU's who belong to the lower class in terms of classification has no identified resettlement area intended for informal settlers this is maybe due to budgetary constraint and prioritization of programs. Local Chief Executives (LCE's) prefer to allocate a significant amount of their budget to other programs such as infrastructure, social services and agriculture.

3. There are still households constructing houses in lots they do not own and without consent of the rightful owners could be evicted anytime and maybe considered as squatters.
4. There were more single houses constructed than either duplex or multi-residential types

**Goal :**

1. To improve the delivery of shelter/housing programs in every locality in the Province,

**Objectives:**

1. To reduce number of informal settlers by 50% by 2022
2. To assist LGU's in fund sourcing/linkage to existing donors/partners such as Pabahay Program by 2016

**Strategic Plan and Focus**

1. Address the housing needs and gaps in every LGU/locality.
2. Adapt alternative housing technologies, schemes and approaches to ensure decent and affordable homes. In relation to this, the following will also be undertaken:
3. Employ labor-intensive method in the implementation of housing projects wherever feasible to generate employment in the beneficiary communities;
4. Develop and implement the appropriate standards in the construction of the housing units to incorporate DRRM and CCA;
5. Ensure that all government infrastructure projects integrate the relocation and resettlement requirements of affected families into their plans and costing in collaboration with other concerned agencies;
6. Develop a financing framework for relocation and resettlement, including workable PPP schemes for socialized housing development;
7. Provide incentives to real estate developers like Income Tax Holidays (ITH)
8. Promote aggressive linkages between and among LGU's/NGAs, donors/partners like Pabahay Programs.
9. To Support LGUs efforts to develop a system of land inventory to better identify areas for urban growth and planned areas for human settlements through their Comprehensive Land Use Plans (CLUPs).

**6.3.4 Security**

Davao del Norte remains peaceful and emerging as among the most favored place for business-trade, tourism, and sports event in Mindanao. Despite some incidents caused by Lawless Armed Group (LAG)/New People's Army (NPA) and other lawless elements criminality situation remains to be manageable.

**a. Crime Incidence**

As shown in the crime volume for the last 3 years (2012-2014), highest cases were reported in 2013, henceforth, crime volume has been decreasing. This decrease is attributed by the intensified campaign against illegal drugs, gambling and other forms of criminalities. Please refer to Table No. 3-190

*Table No. 3-190: Crime Incidence*

**Davao del Norte, 2012-2014**

<b>Crime by type</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Murder	118	83	120
Homicide	34	67	117
Physical Injury	145	2,202	1,605
Rape (Women)	9	125	89
Robbery	176	895	706
Theft	296	1,944	1,805
<b>TOTAL</b>	<b>778</b>	<b>5,316</b>	<b>4,442</b>

*Source: PNP, Davao del Norte*

Index crimes is defined as reported crimes against person and properties. Tagum City registered the highest number of index crime cases in 2014, while San Isidro has the lowest reported cases. (Table No. 3-191).

*Table No. 3-191 : Index Crimes by LGU,  
Davao del Norte, 2014*

<b>LGU</b>	<b>Murder</b>	<b>Homicide</b>	<b>Physical Injury</b>	<b>Rape</b>	<b>Robbery</b>	<b>Theft</b>	<b>Total</b>
Asuncion	14	4	79	4	17	55	<b>173</b>
B. E. Dujali	1	13	20	3	8	36	<b>81</b>
Carmen	8	11	113	18	38	132	<b>320</b>
Kapalong		5	140	8	39	159	<b>351</b>
New Corella	6	5	49	2	21	34	<b>117</b>
San Isidro	3	0	31	3	0	6	<b>43</b>
Sto. Tomas	3	23	255	19	61	285	<b>646</b>
IGACOS	8	7	163	8	31	121	<b>338</b>
Panabo City	10	17	194	22	174	366	<b>783</b>
Tagum City	24	30	549	2	314	597	<b>1,516</b>
Talaingod	40	2	12	0	3	14	<b>71</b>
<b>TOTAL</b>	<b>117</b>	<b>117</b>	<b>1,605</b>	<b>89</b>	<b>706</b>	<b>1,805</b>	<b>4,439</b>

*Source: PNP, Davao del Norte*

For crimes against existing laws or non-index crimes, Table No. 3-192 shows that Tagum City registered the highest reported cases, while San Isidro has the lowest number of cases.

*Table No. 3-192: NON-INDEX CRIMES by LGU,  
Davao del Norte, 2014*

SPECIAL LAWS	POLICE STATION												TOTAL
	DNP PO/DNP PSC	Asun-cion	BE Dujali	Car men	IGCS	Kap alog	New Coreolla	Pan abo	San Isidro	Sto. Tomas	Tagum	Talain god	
RA 1780								9					9
RA 10591	4	7	2	5	11	4	5	15		9	28	1	91
RA 9165	16	3	6	10	11	47	3	26	2	13	29		136
RA 9287	3	2	6	7	1	5	3	3		3	7		40
RA 4136	5	36	1	8	36	17	4	106		2	76		291
RA 8550			1										1
PD 856													
ESTAFA													
TAX CODE													
RA 907													
RA 9239													
RA 9262													
RA 9211				3				60					63
RA 4419													
PD 1612											1		1
PD 1619													
PD 969													
PD 1602	3	1		9	1			9					23
PD 705			1	1	2	8	1	1	3			4	21

Source: PNP, Davao del Norte

Table No. 3-193 below presents the comparative number of reported cases in all crimes in Region XI in 2014.

*Table No. 3-193: Index and Non-Index Crimes by LGU  
Region XI, 2014*

	Davao City	Davao Sur	COMVAL	DAVAO ORIENTAL	DAVAO NORTE
All Crimes	25,966	15,406	6,846	5,099	11,820
Index Crimes	9,201	5,098	2,958	1,932	5,319
Murder	169	123	162	88	120
Homicide	26	49	29	46	49
Physical Injury	3,418	2,867	1,099	761	1,579
Rape	285	101	90	90	93
Robbery	1,285	331	344	220	765
Theft	3,936	1,517	1,204	681	2,658
Non-Index Crimes	16,765	10,308	3,888	3,167	6,501
Ave. monthly crime rate	138.47	137.07	77.00	76.14	96.60

Source: PNP, Region XI

According to Violence against Women and Children (VAWC's) desk statistics that in 2014 wife battering has the highest reported cases with 1,569 cases followed by acts of lasciviousness with 37 reported cases.

**Table No. 3-194: Reported Crimes Against Women,  
Davao del Norte, 2014**

Types of Cases	2014
Rape	27
Attempted Rape	9
Battered Wife (RA 9262)	1,569
Physical Injuries	17
Threats	0
Acts of Lasciviousness	37
Slander	5
Grave Oral Defamation	0
Attempted Homicide	0
Robbery with Frustrated Homicide	0
Parricide	1
Murder	3
Concubinage	7
Others	10
<b>TOTAL</b>	<b>1,685</b>

Source: PNP, Davao del Norte

As shown in Table No. 3-194, data on violence against women committed in 2014 shows that majority of the perpetrators are known to the victims. In fact, 48% of the reported cases are committed by the husbands. The reported cases were usually committed inside the house, thus, Violence Against Women (VAW) cases are domestic in nature.

**Table No. 3-195 : No. of Perpetrators of Violence Against Women (VAW)  
by Relation to Victim, Davao del Norte, 2014**

Relation to Victim	No. of Perpetrators	%
Husband	816	48
Live-in Partners	676	39.76
No Relation	55	3.23
Unidentified	8	0.47
Brother-in-Law	3	0.17
Husband's Father	0	0
Brother	3	0.17
Half Brother	0	0
Neighbor	29	1.70
Boyfriend	75	4.41
Relative	10	0.58
Others	25	1.47
<b>Total</b>	<b>1,700</b>	

Source: PNP, Davao del Norte

**Table No. 3-196: Cases on Violence Against Women by Place and Time of Commission,  
Davao del Norte, 2014**



Type of Cases	Total No. of Cases	Place of Commission						Time of Commission			
		Inside the House		Outside the House		Public Place		Daytime		Nighttime	
		No.	%	No.	%	No.	%	No.	%	No.	%
Rape	27	19		18		1		12			
Battered Wife	1,569	1,195		357		15		737		781	
Acts of Lasciviousness	37	24		12		1		18		16	
Threat	0	0		0		0		0		0	
Physical Injuries	30	8		7		0		10		5	

Source: PNP, Davao del Norte

Table No. 3-197 shows that in CY 2014, majority of the women victims are middle aged, while 61% of the victims ages from 21 to 40 years old.

**Table No. 3-197 : No. of Victims of Violence Against Women, by Age Group, Davao del Norte, 2014**

Type of Cases	Ages of Victims					
	16-20	21-30	31-40	41-50	51 & Above	Total
Rape	3	7	0	0	1	11
Battered Wife	186	269	186	74	29	744
Acts of Lasciviousness	6	6	3	0	0	15
Threat	0	1	0	0	0	1
Physical Injuries	9	10	5	0	0	24
<b>Total</b>	204	293	194	74	30	795

Source: PNP, Davao del Norte

Crime solution efficiency is defined as the percentage of solved cases out of the total number of crime incidents handled by law enforcement agencies for a given period of time. While crime clearance efficiency is the percentage of cleared cases out of the total number of crime incidents handled by law enforcement agencies for a given period of time.

In 2014, the municipality of San Isidro shows the highest percentage of solved out cases and as well as cleared cases when compared among the cities and municipalities in Davao del Norte. On the other hand, the municipality of Kapalong demonstrates the lowest percentage of solved out cases or crime solution efficiency while the municipality of Talaingod has the lowest percentage of cleared cases or the crime clearance efficiency.

**Table No. 3-198: Crime Clearance Efficiency and Crime Solution Efficiency Davao del Norte, 2014**

LGU	Crime Clearance Efficiency	Crime Solution Efficiency
Asuncion	68.28	64.14
BE Dujali	60.23	50.29
Carmen	59.50	51.87

IGACOS	52.50	50.23
Kapalong	41.48	38.88
New Corella	57.87	39.89
Panabo City	64.61	58.66
San Isidro	82.35	72.55
Sto. Tomas	62.51	45.31
Tagum City	59.94	59.04
Talaingod	52.08	25.00
<b>TOTAL</b>	<b>59.98</b>	<b>54.00</b>

Source: PNP, Davao del Norte

### b. Police Force

Davao del Norte has a total 626 police force, 563 or 90% are male officers while 63 or 10% are female officers. Women law enforcers are holding positions from Police Officer I up to Police Senior Officers. Majority of the female police officers are assigned as Women's and Children's Desk Officers of the existing Police Stations in the province.

Translated into personnel to population ratio, each police officer is protecting 1,353 persons from various crimes. This does not meet the standard requirement of one law enforcer for every 1,000 persons in municipalities and one law enforcer for every 750 persons in component cities, as set forth in Republic Act 6975, the Philippine National Police Law, as amended by Republic Act No. 8551. Please refer to Table No. 3-199.

**Table No. 3-199: Protective Personnel/ Services/ Police, Ratio to population,  
By City/Municipality, Davao del Norte, 2014**

City / Municipality	Population 2010	POLICE FORCE				
		Current Force			Ratio to Population	No. of Stations
		F	M	Total		
Tagum City	242,801	9	94	103	1:2,097	4
New Corella	50,699	3	24	27	1:1,715	1
Asuncion	55,844	3	28	31	1:1,636	1
San Isidro	25,548	3	24	27	1:915	-
Sto. Tomas	109,269	3	31	34	1:2,859	1
Kapalong	68,261	3	28	31	1:1,992	1
Talaingod	25,566	2	23	25	1:784	1
Panabo City	174,364	5	60	65	1:2,374	1
Carmen	69,199	4	26	30	1:2,055	1
B.E. Dujali	28,339	3	19	22	1:1,131	1
IGaCoS	95,874	6	69	75	1:1,203	3
DNPO	945,764	14	45	59	-	-
1101 <sup>st</sup> PMG		5	92	97	-	-
<b>GRAND TOTAL</b>	<b>847,440</b>	<b>63</b>	<b>563</b>	<b>626</b>	<b>1:1,353</b>	<b>15</b>

Source: PNP, Davao del Norte

To augment the existing police forces, Community-Oriented Policing System (COPS) has been established primarily to ensure that police assistance can be easily extended. Anti-crimes group are also organized which are voluntary in nature and mostly civilians and private organizations.

### c. Police Equipment and Facilities

Data shows that there is a total of 15 police stations in the province Table No. 3-199, with four (4) patrol cars Table No. 3-200. The existing equipment and facilities are not sufficient and need upgrading.

*Table No. 3-200: Summary of Police Equipment Facilities,  
Davao del Norte, 2014*

UNIT	Short Firearms			Long Firearms			No. of Vehicle
	Cal. 38	Cal. 45	9 mm	M16	M14	Shot-gun	Patrol Cars
Tagum City	-	1	118	18	2	-	1
New Corella	-	4	37	18	1	-	-
Asuncion	-	2	35	13	1	-	1
San Isidro	-	3	25	9	3	-	-
Sto. Tomas	-	3	59	23	-	-	-
Kapalong	-	-	47	21	2	-	-
Talaingod	-	2	29	15	6	-	-
Panabo City	-	5	94	29	1	-	-
Carmen	-	2	49	18	2	-	-
B.E. Dujali	-	1	31	10	2	-	-
IGaCoS	-	4	96	24	1	-	1
DNPPPO	-	13	80	21	6	10	1
DNPPSC	1	5	176	183	17	2	-
<b>TOTAL</b>	<b>1</b>	<b>45</b>	<b>876</b>	<b>402</b>	<b>44</b>	<b>12</b>	<b>4</b>

*Source: PNP, Davao del Norte*

The security force in Davao del Norte should double its efforts in combating criminalities and other lawless elements in the society.

### d. Fire Force/ Facilities

The current fire force of the province is 149, with five (5) fire officers, 141 non-commissioned officers and three (3) civilian staff/non-uniformed personnel. When translated into fire force and population ratio, each fire officer is serving 7,008 populations, which is beyond the standard set by Republic Act No. 6975 of one (1) fire officer for every 2,000 population.

There are only nine (9) fire stations operating in the province. These include the Tagum City Fire Station with four (4) units fire trucks; IGaCoS Fire Station with three (3) units fire

truck; Panabo Fire Station with eight (8) units fire truck; Kapalong and Sto. Tomas Fire Stations with two (2) units fire truck each; Municipalities of Carmen, Asuncion, New Corella and Talaingod with one (1) fire truck each. The existing fire station in Tagum City is augmented by the City Disaster Risk Reduction Management Office(CDRRMO) of Tagum City and Provincial DRRMO.

Two (2) LGUs to include Braulio E. Dujali and San Isidro have no fire stations. However, they are strategically located and adjacent to LGUs with available fire stations. There is also no office for the provincial fire marshal. They are only sharing a space at the Tagum Fire Station.

**e. Fire Incidence**

Table 3-143 shows that the extent of fire damage in the last three (3) years had been increasing with total damage amount of Php 82 Million in 2014. According to the report of the Provincial Fire Marshal, most of the causes of these fire incidents were due to electrical faulty wiring and majority of its zoning classification are in residential areas. Please refer to Table No. 3-201.

*Table No. 3-201: Fire Incidence  
Davao del Norte, 2012 - 2014*

Particular	2012	2013	2014
Fire Incidence Reported	101	130	137
Fire Damaged Reported (Php)	69,128,120.00	44,274,454.00	82,150,805.00

*Source : Bureau of Fire Protection, Davao del Norte*

**Issues and Challenges:**

- Prevalence of drug dependents
- Recorded cases of index crime, i.e. theft, physical injury, robbery, etc.
- Polarizing and exploitation of the IP community by the left leaning segment of society
- Increasing incidence of vehicular accidents
- Low LGU compliance to the certain provisions of the Fire Code or RA 9514
- Lesser priority on the reintegration of former rebels (FR) to the society

**Strategies**

- Strengthen convergence effort of all stakeholders relative to the promotion of anti-drug abuse campaign
- Promote police visibility through Police Integrated Patrolling System and IEC on crime prevention

- Increase IPs awareness of their rights and privileges through community-based consultations promoting their customary laws and other culture and traditions.
- Regulate the use of motor for hire (single motorcycle) in urban areas.
- Installation and maintenance of road furniture and other safety devices for the benefit and convenience of the motoring public.
- Creation and operationalization of a localize halfway house.
- Strict monitoring of LGU compliance to RA 9514.
- Strengthen CLIP for rebel returnees.

### Programs and Projects

- **Peace and Order Program**
  - Anti-Crime and Government Integration Project
  - Probationeers, Parolees & Pardonees Rehab. Project
  - Const. of Half-way House for Former Rebels
  - Comprehensive Legal Assistance Project
  - Provision of livelihood and skills development projects to IPs, rebel returnees, and drug dependents
  - Capability development of BADAC
  - Conduct of IEC
  - IPS documentation
  - Upgrading of fire equipment and facilities
  - Conduct of CLIP orientation with stakeholders, profiling and reintegration planning.

### 6.3.5 Social Welfare

In its efforts to alleviate poverty, Davao del Norte continues to provide social welfare programs for the disadvantaged children, youth, elderly and disabled persons and the indigenous peoples and other disadvantaged groups

#### a. Children and Youth Welfare

Around 49% of the total populace aged 0 -14 years old needs bigger requirements for social services including welfare-services. In 2014, a total of 489 day care centers cater to the development of pre-schoolers in 223 barangays provincewide.. About 43% or 210 of the daycare centers are duly accredited with DSDW Region XI while accreditation of the 276 centers or 29% is still on-going. Tagum City has the most number of day care centers while B. E. Dujali has the least number.

*Table No. 3-202: Day Care Centers Profile  
Davao del Norte, 2014*

Municipality/ City	No. of Brgys.	No. of DCCs	No. of DCWs	DCC not Accredited	%	DCC accredited	%
Tagum City	23	84	84	17	20.23	67	79.77
Asuncion	20	31	31	27	87.10	4	12.90
Kapalong	14	55	55	3	5.45	52	94.55

San Isidro	13	23	23	18	78.26	5	21.74
Talaingod	3	31	31	22	70.97	9	29.03
New Corella	20	36	33	9	25	24	75
B.E. Dujali	5	18	19	16	88.89	2	11.11
Carmen	20	33	33	30	90.91	3	9.09
IGACOS	40	59	59	-	-	59	100
Panabo City	46	68	68	68	100	0	0
Sto. Tomas	19	51	42	-	-	51	100
<b>Total</b>	<b>223</b>	<b>489</b>	<b>478</b>	<b>210</b>	<b>42.94</b>	<b>276</b>	<b>56.44</b>

Source: PSWDO, Davao del Norte

Table No. 3-202 shows that enrollment in day care centers had been increasing for the last three (3) school years. An increase of 3.24% enrollees in SY 2013-2014 and about 1.05% increase in SY2014-2015. An increase of 33% was also reported in year 2012. Kapalong has the biggest number of children enrolled in day care center for the past three (3) school years. This can be attributed to the large number of existing day care centers and day care workers.

**Table No. 3-203: Statistics on Day Care Service Program**  
Davao del Norte: SY 2012-2015

City/Municipality	2012-2013	2013-2014	2014-2015
<b>Asuncion</b>			
Day Care Centers	30	31	31
Day Care Workers	30	31	31
Children	<b>1,205</b>	<b>1,292</b>	<b>1,210</b>
Male	612	666	611
Female	593	626	599
<b>B.E. Dujali</b>			
Day Care Centers	18	18	19
Day Care Workers	19	19	18
Children	<b>494</b>	<b>556</b>	<b>566</b>
Male	229	276	274
Female	265	280	292
<b>Carmen</b>			
Day Care Centers	33	33	34
Day Care Workers	33	33	34
Children	<b>1,347</b>	<b>1,342</b>	<b>1,345</b>
Male	638	667	662
Female	679	675	683
<b>Kapalong</b>			
Day Care Centers	55	55	57
Day Care Workers	55	55	57
Children	<b>1,863</b>	<b>1,820</b>	<b>2,067</b>
Male	901	919	1,041
Female	962	901	1,026
<b>New Corella</b>			
Day Care Centers	36	36	37
Day Care Workers	31	33	33
Children	<b>1,516</b>	<b>1,565</b>	<b>1,107</b>
Male	786	851	560
Female	730	714	547



<b>San Isidro</b>			
Day Care Centers	23	23	22
Day Care Workers	23	23	22
Children	<b>688</b>	<b>687</b>	<b>646</b>
Male	338	337	318
Female	350	350	328
<b>Sto. Tomas</b>			
Day Care Centers	49	51	52
Day Care Workers	42	42	430
Children	<b>1,585</b>	<b>1,837</b>	<b>2,031</b>
Male	761	887	1,011
Female	824	950	1,020
<b>Talaingod</b>			
Day Care Centers	31	31	30
Day Care Workers	31	31	30
Children	<b>1,116</b>	<b>1,253</b>	<b>1,293</b>
Male	567	625	600
Female	549	628	693
<b>Panabo City</b>			
Day Care Centers	66	68	72
Day Care Workers	66	68	72
Children	<b>2,387</b>	<b>2,841</b>	<b>2,841</b>
Male	1,237	1,311	1,436
Female	1,150	1,530	1,405
<b>IGACOS</b>			
Day Care Centers	59	59	59
Day Care Workers	59	59	59
Children	<b>2,262</b>	<b>1,784</b>	<b>1,726</b>
Male	1,083	879	823
Female	1,179	905	903
<b>Tagum City</b>			
Day Care Centers	84	84	91
Day Care Workers	84	84	91
Children	<b>4,512</b>	<b>4,602</b>	<b>4,954</b>
Male	2,071	2,116	2,425
Female	2,441	2,486	2,529
<b>Total</b> Day Care Centers	<b>484</b>	<b>489</b>	<b>504</b>
<b>Total</b> Day Care Workers	<b>473</b>	<b>478</b>	<b>877</b>
<b>Total</b> Children	<b>18,945</b>	<b>19,579</b>	<b>19,786</b>
<b>Total</b> Male	<b>9,223</b>	<b>9,534</b>	<b>9,761</b>
<b>Total</b> Female	<b>9,722</b>	<b>10,045</b>	<b>10,025</b>

Source: PSWDO, Davao del Norte

As shown in Table No. 3-204, Davao del Norte has the second highest number of day care centers and enrollees in the region next to Davao City.

**Table No. 3-204: Profile of Day Care Center/Workers**  
Region XI, 2014

Province	No. of Municipality/ City	No. of Day Care Centers	No. of Children Served
Davao del Norte	11	506	20,786
Comval Province	11	463	-

Davao del Sur	15	489	-
Davao Oriental	11	478	-
Davao City	1	556	-

Source: *DSWD, Region XI*

The Youth Sector comprises around 25% of the total population. As pillars of the nation, they need strong foundation. Pag-asa Youth Association of the Philippines (PYAP) is organized and federated in the provincial level, a total of 11,385 youth members representing the Out of School Youth (OSY) in the province are also organized in the different cities and municipalities.

Table No. 3-205 reveals that the most number OSY is in the municipality of Sto. Tomas with 6,233 youth members while Talaingod has the least with 98 youth members. There are more males OSY than females.

*Table No. 3-205: Profile of Out of School Youth,  
Davao del Norte, CY 2014*

City/ Municipality	No. of Male	No. of Female	Total
Asuncion	198	119	317
B.E, Dujali	86	94	180
Carmen	352	386	738
Kapalong	1,180	747	1,927
New Corella	617	497	1,114
San Isidro	-	-	
Sto. Tomas	3,308	2,925	6,233
Talaingod	80	18	98
IGACOS	86	86	172
Panabo City	328	276	604
Tagum City	-	-	
<b>Total</b>	<b>6,235</b>	<b>5,148</b>	<b>11,385</b>

Source: *PSWDO, Davao del Norte*

As presented in Table No. 3-206, a total of 1,872 and 5,344 persons with disabilities were reported in 2013 and 2014 respectively. IGaCos has the most number of registered disabled persons while San Isidro has the least. There are more female disabled persons than the male.

*Table No. 3-206: Profile of Registered Persons with Disability  
Davao del Norte, CY 2013 and CY 2014*

City/Municipality	No. of Registered PWDs					
	2013			2014		
	M	F	Total	M	F	Total
Tagum City Association for Persons with Disability TCAP	117	83	200	117	83	200
Panabo Association for Differently Abled Persons PADAP	123	126	249	352	276	628
IGACOS Association for Differently Abled Persons	224	257	481	224	257	481
New Corella Association for Differently Abled Persons	33	10	43	132	77	209

Asuncion Association for Differently Abled Persons	34	16	50	251	260	511
Talaingod Association of Persons with Disability	53	19	72	53	47	100
Kapalong Association for Differently Abled Persons	117	149	266	291	151	442
San Isidro Association for Differently Abled Persons	22	12	34	22	12	34
Carmen Parents Mobilization Action Group	145	60	205	345	476	812
BE Dujali Association for Disabled Persons	52	20	72	70	50	120
Sto. Tomas Association for Disabled Persons	90	110	200	1,103	877	1,980
<b>Total</b>	<b>1,010</b>	<b>1,498</b>	<b>1,872</b>	<b>2,852</b>	<b>2,492</b>	<b>5,344</b>

Source: PSWDO, Davao del Norte

Table No. 3-207 shows that there are 11 senior citizens associations in Davao del Norte with total members of 43,565. Panabo City has the most number of senior citizens, while Talaingod has the least. There are more female senior citizens than males.

**Table No. 3-207: Profile of Registered Senior Citizens  
Province of Davao del Norte, CY 2014**

Name of Senior Citizens Association		Number of Members		
		Male	Female	Total
1.	Asuncion Senior Citizens Association	1,370	1,378	2,756
2.	Dujali Senior Citizens Association	433	567	1,000
3.	Carmen Senior Citizens Association	1,283	1,699	2,982
4.	Kapalong Senior Citizens Association	2,112	2,070	4,184
5.	New Corella Senior Citizens Association	1,362	1,385	2,747
6.	San Isidro Senior Citizens Association	1,200	800	2,000
7.	Sto. Tomas Senior Citizens Association	1,485	1,650	3,135
8.	Talaingod Senior Citizens Association	290	292	582
9.	IGACOS Senior Citizens Association	3,226	4,051	7,227
10.	Panabo Senior Citizens Association	6,377	6,370	12,747
11.	Tagum City Senior Citizens Association	1,675	2,488	4,163
TOTAL		<b>20,813</b>	<b>22,752</b>	<b>43,565</b>

Source: PSWDO, Davao del Norte

The Philippine Senior Citizens Act 7876 is an act establishing a senior citizens center in all cities and municipalities. Dedicated to improving the lives of the elderly, Davao del Norte has identified elderly centers and senior citizen's office to cater their needs.

**Table No. 3-208: Inventory of Elderly Day Center and Office  
Davao del Norte, CY 2014**

Elderly Day Center	Location
IGACOS	Peñaplata
Kapalong	Maniki
Asuncion	Brgy. Cambanogoy
Tagum City	Brgy. San Miguel

Panabo City	Brgy. New Pandan
Carmen	Brgy. Ising
<b>Senior Citizen's Office</b>	
Talaingod	Brgy. Sto. Niño
San Isidro	Brgy. Sawata
New Corella	Brgy. Poblacion
Sto. Tomas	Brgy. Tibal-og

Source: PSWDO

To respond to the needs of the marginalized groups, the Provincial Government established residential facilities to support women who are victims of all forms of abuse. The Women Development Center was able to assist 22 and 32 abused women in 2013 and 2014, respectively. The province also provided case management for psychological, residential and legal assistance for the admitted women for them to recover from their traumatic experiences.

With the aim to assist women and men including minors who are victims of illegal drugs, alcohol and other conflicts, The Provincial Government established various residential facilities.

The Women Development Center housed women who are VAW victims. It provides psychological, legal and other assistance to the victims. There were 22 and 32 women admitted in 2013 and 2014, respectively.

The Luntiang Paraiso Regional Rehabilitation Center (LPRRC) provides psychological management to its residents. In 2013, 61 were admitted 58 of which were males while 3 were females. In 2014, an increase of 39.60% admission is registered in LPRRC. Out of the 101 admissions, 89 were males while 12 were females.

With the increasing incidence of minor committing crimes, Bahay Pag-asa was established on September 2014 to cater the Children in Conflict with the Law (CICL). Within three (3) months of operation, the Bahay Pag-asa was able to assist eight (8) CICLs. Bahay Pag-asa implements various programs and services, such as homelife, recreation activities, social services, alternative learning system, health services and legal assistance.

**Table No. 3-209: Residential Facilities**  
Davao del Norte, 2013-2014

Name of Residential Facility	Number of Admitted Clients					
	2013			2014		
	F	M	Total	F	M	Total
Women Development Center	22		22	32		32
Luntiang Paraiso Regional Rehabilitation Center (LPRRC)	58	3	61	89	12	101
Bahay Pag-asa	-	-	-		8	8

Source: PSWDO

The crisis intervention services cater the basic needs of the disadvantaged individuals/families in crisis situation in order to restore their social functioning. Further, financial and medical assistance was provided to 596 and 3,458 individuals/families, respectively who were diagnosed and admitted in public hospitals due to ailments. Furthermore, financial/transportation assistance was provided to walk-in indigents whose were confined at any government hospitals and those whose social function was impaired. And pauper's burial assistance was also provided to 1,030 beneficiaries province-wide. Table No. 3-210.

**Table No. 3-210: Crisis Intervention Services**  
Davao del Norte, 2014

Types of Assistance to Individuals in Crisis Situation (AICS)	Male	Female	Total
Financial Assistance	302	294	596
Medical Assistance	2,478	980	3,458
Transportation Assistance	65	74	139
Paupers Burial Assistance	622	408	1,030
WWII Veterans Support	10	-	10

Source: PSWDO

### b. Indigenous Peoples

Table No. 3-211 shows that there are various indigenous groups in Davao del Norte but the major tribe includes the Cebuano. The rest of the tribes are considered migrant Indigenous People (IPs).

**Table No. 3-211: Indigenous Tribes in**  
Davao del Norte, CY 2014

GROUP	Population	GROUP	Population
Cebuano	726,584	Kalagan	7,236
Boholano	66,724	Waray	6,925
Hiligaynon, Ilonggo	65,651	Tagalong	6,334
Ilokano	27,318	Dibabawon	4,069
Davaweño	25,525	Maranao	3,487
Ata-Manobo	13,386	Surigaonon	3,182
Davao-Chavacano	13,185	Tausug	2,962
Ata	10,202	Other Local Dialect	23,501
Mandaya	9,269	No Stated	2,763

Isamal Kanlaw	8,530		
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Source: SEEP, Davao del Norte

Government and non-government initiatives have been in place towards the welfare of the Indigenous Peoples (IPs), however, a lot of work is yet to be undertaken for them to have a better quality of life.

The indigenous people are highly vulnerable and have the lowest socio-economic status according to the Regional Development Plan (2004 - 2010). They are not involved in the decision making process and are very much disadvantaged in terms of educational status, health and access to employment.

### ISSUES AND CONCERNS

1. Limited access of disadvantage sector to social services
2. Increasing incidence of VAWC/Domestic Violence and Deviant Children

### POSSIBLE CAUSES

1. Urban – Rural Bias (disparity of distribution)
2. Degrading family values

### GOAL

1. Increased access of the marginalized sector to basic social services

### OBJECTIVES

1. To implement universal coverage of 4Ps, Philhealth para sa masa to the vulnerable groups in 2022.
2. To reduce incidence of VAWC and Domestic Violence by 50% in 2017
3. To increase participation by 100% within the planning period of the vulnerable sectors to social welfare programs
4. To strengthen access to the poorest of the poor families with child below 14 years old in the 4Ps program by 100% in 2016.

### STRATEGIES

1. Revisit existing policies/regulations in the provision of basic social services to the vulnerable groups
2. Strengthen comprehensive programs/interventions for victims of VAWC
3. Strengthen implementation of social welfare and gender related programs in all barangays by 2022.



4. Enhance provision of welfare services to children in conflict with law, women victims and drug dependents.
5. Empowerment of the members of the disadvantaged sectors through a positive bias in terms of access to basic social services and meaningful engagement in government processes.

## **PROGRAMS, PROJECTS AND ACTIVITIES**

### **a. Social Protection and Intervention Program**

- Crisis Intervention Project
- Residential Care Facilities Project
- Community Welfare Project
- Child Development Center Project
- Sheltered Workshop Facility for PEDs and Elderly Project

### **Disaster Risk and Vulnerability Assessment of Critical Facilities**

Not all disasters particularly natural disasters can be prevented. Natural disasters including flood, earthquake, ground shaking, rain induced landslide and liquefaction have immediate impacts on human health and secondary impacts causing further death and suffering of affected population. The risk of loss of life and injury can be mitigated in knowing the hazards and degree of exposure and how vulnerable the people are. The consequences of these hazards depend upon how exposed the community is including its infrastructure and critical facilities.

The Critical Facilities exposed to Liquefaction Hazard Map shows areas susceptible to liquefaction caused by earthquake. Susceptibility classification includes: High, Moderate, and Low.

## **6.4 UTILITY / INFRASTRUCTURE SERVICES**

Infrastructure development is a vital component in community growth and progress. Adequate and sustainable infrastructure needs to be in place to ensure high quality of life of the constituents. Easy access to safe and potable water, sanitation facilities and electrification should therefore be afforded accordingly.

### **6.4.1 Water and Sanitation**

#### **Potable Water**

As of 2014, about 90% of the household population had access to potable water sources, but only 30% or 66,943 households were served with level III water facilities, which can be considered as sustainable service. A sizeable portion of household remains dependent on level I and II water system and other sources. (See Table No. 3-212).

**Table No. 3-212: Existing Water Supply Source by Cities/Municipalities by Household Served  
Davao del Norte As of 2014**

Municipalities / Cities	# of HH**	Water Supply Sources & HH** Served										HH** w/ access to potable water	
		# of Level I	HH** w/ access	# of Level II	HH** w/ access	# of Level III	HH** w/ access	Doubtful Sources	HH** w/ access	Pedd-lers	HH** w/ access	# of HH**	%
1. Asuncion	13,838	233	6,861	24	1,342	13	1,659	105	410	81	3,571	13,433	97
2. Carmen	5,220	39	1,330	-	-	4	258	491	549	56	2,717	4,305	82
3. B.E. Dujali	17,568	159	3,480	1	115	-	-	381	381	333	13,592	17,187	97
4. IGaCos	24,614	101	2,619	242	12,234	61	8,488	305	311	5	962	24,303	98
4.1 Babak	10,170	58	1,537	131	3,554	35	4,194	131	131	2	754	10,039	98
4.2 Kaputian	7,344	12	405	21	5,176	10	1,501	82	88	1	174	7,256	98
4.3 Samal	7,100	31	677	90	3,504	16	2,793	92	92	2	34	7,008	98
5. Kapalong	12,256	780	5,695	21	2,206	18	2,941	20	1,159	13	1,348	12,190	99
6. New Corella	13,304	135	3,521	57	4,394	29	2,561	392	842	52	1,986	12,462	93
7. Panabo City	40,191	3,603	16,066	131	1,804	21	7,475	950	14,392	156	454	25,799	64
8. San Isidro	6,320	33	1,451	29	2,312	13	1,351	99	1,339	-	16	5,130	81
9. Sto. Tomas	25,713	2,927	7,617	27	342	168	10,895	297	1,144	50	5,715	24,569	95
10. Tagum City	54,330	74	8,319	35	2,550	18	30,801	7	514	242	12,146	53,816	99
11. Talaingod	4,882	76	2,252	31	1,398	3	514	26	713	-	-	4,164	85
<b>Total</b>	<b>218,236</b>	<b>8,160</b>	<b>59,211</b>	<b>598</b>	<b>28,697</b>	<b>348</b>	<b>66,943</b>	<b>3,073</b>	<b>21,754</b>	<b>988</b>	<b>42,507</b>	<b>197,358</b>	<b>90</b>
<b>%</b>			<b>27</b>		<b>13</b>		<b>30</b>		<b>9.9</b>		<b>19.47</b>		

Source: Provincial Health Office (PHO)

Notes: HH\*\* - Actual household survey conducted by PHO Field workers.

Water services in component cities and even in some municipalities are provided by the Local Water Districts which are operating under the technical and financial assistance of the Local Water Utility Administration (LWUA). Government constructed water systems are also catering the water needs of the other areas which are operated and managed either by the Rural Waterworks and Sanitation Associations (RWSAs), municipal and barangay government, water committees or merely association. Other water sources are doubtful and supplied by peddlers.

In 2014, Davao del Norte has eight (8) water districts, namely: : Asuncion Water District, B.E. Dujali Water District, Carmen Water District, New Corella Water District, Island Garden City of Samal Water District, Kapalong Water District, Panabo City Water District and Tagum City Water District. A total of 41,083 connections were reported in 2014. Its service connections are classified into residential, government and commercial. Majority of the consumers are those with residential connections with 37,550 residents. Table No. 3-213

**Table No. 3-213: Water District Service Connections  
Davao del Norte, CY 2014**

Name of Water Districts	Service Connections			Total	Minimum Charge (Php)
	Residential	Government	Commercial		
1. Tagum Water District	24,015	126	2,019	26,160	164.15
2. Kapalong Water District	1,491	32	-	1,523	75.00

3.	IGACOS Water District	4,471	73	83	4,627	155.90
4.	BE Dujali Water District	468	-	73	541	238.30
5.	Carmen Water District	698	-	180	878	248.50
6.	Asuncion Water District	357	20	40	417	230.00
7.	New Corella Water District	1,392	46	51	1,489	187.56
8.	Panabo City Water District	4,658	49	741	5,448	194.35
	<b>Total</b>	<b>37,550</b>	<b>346</b>	<b>3,187</b>	<b>41,083</b>	<b>-</b>

Source: LWUA Website

The prevalence of water peddlers in most areas of the province is a strong indication of water shortage or poor water qualities. Water trucks from outside Davao del Norte mostly from Davao City delivered water through water trucks to these peddlers. Processed water is also available particularly in the urban centers.

As the population increases, the demand for potable water also increases. It is a known fact that water sources are depleting due to environmental destruction and changes, so that provision of adequate and sustainable potable water must be considered religiously in development planning undertakings. There is a need to consolidate the utilization of available resources in order to answer the long term water requirement of the increasing populace.

#### 6.4.2 Sanitation

There are no sewerage facilities with treatment plant in the province. Domestic wastewater is disposed through septic tanks, storm drainage, canals and other disposal system without treatment. Excreta are commonly disposed by households through septic tanks and closed pits. As of 2014, 91% of the total households are using sanitary toilets. Tagum City has the highest reported number of household with sanitary toilets, while Talaingod has the least number. (Table Nos. 3-214 and 3-215).

**Table No. 3-214: Comparative Status of Toilet Facilities, 2011-2014  
Davao del Norte, 2011-2014**

Year	Total # of HH**	Status of Toilet Facilities per HH**					
		HH** w/ sanitary toilet	%	HH** w/ Un-sanitary toilet	%	HH** without toilet	%
2011	188,365	171,371	91.00	7,865	4.00	9,129	5.00
2012	196,726	175,844	89.39	11,590	5.89	9,530	4.84
2013	211,986	188,797	89.06	12,860	6.07	9,112	4.30
2014	218,236	198,832	91.11	7,732	3.54	10,994	5.04

Source: Provincial Health Office

(Note: HH\*\* - Actual household survey conducted by PHO Field workers)

**Table No. 3-215: Toilet Facilities,  
Davao del Norte, 2014**

Status of Toilet Facilities per HH**	
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Municipalities/ Cities	No. of HH**	HH** using Sanitary Toilets	%	HH** using Unsanitary Toilets	%	No. of HH** w/o toilet	%
New Corella	13,304	12,632	94.95	612	4.60	53	0.40
Tagum City	54,330	52,729	97.05	826	3.21	218	0.85
San Isidro	6,320	5,135	81.25	1,158	18.32	27	0.43
Kapalong	12,256	11,053	90.18	609	4.97	594	4.85
Asuncion	14,070	11,799	83.86	906	6.55	1,365	9.86
Talaingod	4,882	2,416	49.49	715	14.65	1,751	35.87
B.E. Dujali	5,220	4,933	94.50	203	3.89	84	1.61
Carmen	17,568	17,210	97.96	2	0.00	314	1.79
Panabo City	40,191	36,462	90.72	2,025	2.00	1,704	4.24
Sto. Tomas	25,739	24,673	95.86	0	0.00	751	1.38
IGCS	24,614	19,805	80.46	676	2.75	4,133	16.79
<b>Davao del Norte</b>	<b>218,494</b>	<b>198,847</b>	<b>91.01</b>	<b>7,732</b>	<b>3.57</b>	<b>10,994</b>	<b>5.04</b>

Source: Provincial Health Office (PHO)

Note: HH\*\* - Actual household survey conducted by PHO Field workers.

Table No. 3-152 shows that 198,847 or 91% of households are using sanitary toilets, while 7,732 or 3.57% and 10,994 or 5.04% households are using unsanitary toilets and are without toilets, respectively. This situation implies that there is still a need to further educate the constituents on the values of proper sanitation particularly in the rural areas. Proper sanitation relates closely to the availability of water facilities in the locality.

### 6.4.3 Power/Electricity

Energization has been afforded by the Davao Light and Power Company (DLPC) covering the municipalities of Carmen, Sto. Tomas, B.E. Dujali, and Panabo City, and Davao del Norte Electric Cooperative (DANECO) covering the rest of the LGU's of the province. Both distributors obtained their electric power from Mindanao's power grid of the National Power Corporation (NPC). DANECO has a power capacity of 98.66 MW comprising four (4) substations of its entire coverage. There are three (3) sub-stations located in Tagum City with a total capacity of 45 MVA and one (1) in Asuncion with 5 MVA. The DLPC has four (4) sub-stations with a total capacity of 70 MVA (Table No. 3-216).

**Table No. 3-216: Existing Power Sub-Stations, Davao del Norte**

Power Distributor	Location of Station	Capacity
1. DANECO	Apokon, Tagum City	20 MVA
	Asuncion, Davao del Norte	20 MVA
	Canocotan, Tagum City	20 MVA
	Mirafuentes, Tagum City	20 MVA
	Total	<b>80 MVA</b>
2. DLPC	Panabo City, Davao del Norte	10 MVA
	San Vicente A, Panabo City	10 MVA
	San Vicente B, Panabo City	20 MVA
	TADECO, Panabo City	15 MVA

	Sto. Tomas, Davao del Norte	15 MVA
	Total	<b>70 MVA</b>

Source: Davao Light and Power Company, Davao del Norte Electric Cooperative National Power Corporation, Davao del Norte Sub-Office

All barangays in the province are already covered by the energization program. This is a little bit higher than the regional figure of 99.74% coverage and national scenario of 96.63% coverage.

In terms of household connection, only 65.5% of the potential households were energized as of December 2014. Of this, Davao del Norte Electric Cooperative has energized 61.7% only, while Davao Light and Power Company (DLPC) energized 73% of the potential households. (Table No. 3-217).

Table No. 3-217: **Service area connection of DANECO and DLPC (e.g. Barangay Served / Unserved), December, 2014**

Cities/Municipalities Coverage/Energized	No. of Potential Barangays	No. of Energized Barangays	(%)	No. of Potential Households	No. of House Connection	(%)
<b>DANECO:</b>						
Asuncion	20	20	100%	13,201	6,210	47%
New Corella	20	20	100%	12,181	5,368	44%
San Isidro	13	13	100%	6,260	2,351	38%
Kapalong	14	14	100%	16,283	7,121	44%
Talaingod	3	3	100%	5,954	706	12%
Tagum North	23	23	100%	57,931	50,451	87%
Babak, IGaCoS	16	16	100%	10,008	5,535	55%
Penaplata, IgaCoS	15	15	100%	7,096	3,391	48%
Kaputian, IgaCoS	15	15	100%	7,404	2,921	39%
<b>Total</b>	<b>139</b>	<b>139</b>	<b>100%</b>	<b>136,318</b>	<b>84,054</b>	<b>61.7%</b>
<b>DLPC:</b>						
Panabo City	40	40	100%	33,584	28,302	84%
Carmen	20	20	100%	13,649	8,121	59%
Sto. Tomas	19	19	100%	20,772	14,213	68%
Dujali	5	5	100%	4,447	2,000	45%
<b>Total</b>	<b>84</b>	<b>84</b>	<b>100%</b>	<b>72,452</b>	<b>52,636</b>	<b>73%</b>
<b>Davao del Norte</b>	<b>223</b>	<b>223</b>	<b>100%</b>	<b>208,770</b>	<b>136,690</b>	<b>65.5%</b>
<b>Region XI</b>	<b>1,160</b>	<b>1,157</b>	<b>99.74%</b>	-	-	-
<b>Philippines</b>	<b>41,980</b>	<b>40,567</b>	<b>96.63%</b>	-	-	-

Source: Davao del Norte Electric Cooperative (DANECO) and DLPC, DOE Website

11<sup>th</sup> Status Report on EPIRA Implementation (ER Program Secretariat – DOE)

Among the three (3) component cities of the province, Tagum City has the highest number of household connection with 87 percent, and among the eight (8) municipalities, Talaingod had the lowest with 12 percent.

While power supply is currently sufficient, there is no guarantee that it can meet the future demand with the rapid expansion of commercial and industrial activities within the

province. To meet the power requirements, it is essential to develop alternative sources of energy for the local and commercial consumption in the province.

#### **6.4.4 Renewable Energy Development**

Renewable energy development is one of Davao del Norte’s identified Investment Priority Areas (IPA’s), which are given fiscal and non-fiscal incentives under the Davao del Norte Investment Code of 2014.

At present, there are seven (7) existing and functional Renewable Energy Development (RED) projects in Tagum City, Panabo City, Sto. Tomas and Talaingod serving a total of 715 households. Majority of which are using solar energy. RED projects can be a good source of electricity during power shortage or failure particularly in times of calamity occurrences, aside from the provision of generator sets, emergency lights to calamity stricken areas by the LGUs, other institutions and donors. Table No. 3-218.

**Table No. 3-218: Existing RED Project in LGUs  
Davao del Norte, CY 2014**

<b>Location</b>	<b>Project Name</b>	<b>Company/Agency</b>	<b>Status</b>
San Agustin, Tagum City	Solid Waste to Energy Project	Global Green Int’l. Energy Philippines	-Ground preparation 60% completed -Plant building construction to start January 2016, completion target- February 2016 Commercial operation target – April 2016
Nanyo, Panabo City	Solar Project	Dept. of Energy – BUB	Completed 2013 Benefiting 62 households
Lower Panaga, , Panabo City	Solar Project	Dept. of Energy -BUB	Completed 2013 Served 62 households Expansion – completed Aug. 2015 Benefiting 26 households
Katwalan, Panabo City	Solar Project	Dept. of Energy- Regular budget	Completed Aug.2015 Served 24 households
Sto. Niño, Palma Gil, and Dagohoy in Talaingod (ff-up)	Solar Homelighting	DSWD-KALAHI Pamana, Pillar II	Completed 2013 benefiting 470 households
Sitio Paiton, Dagohoy, Talaingod(ff-up)	Solar Homelighting	Dept. of Energy	Completed 2012 serving 88 households
Magwawa, Sto. Tomas	Solar Power Project	Davao Light and Power Foundation	Completed 2007 serving 45 households Barangay already energized. The solar power project will be a substitute during power failure in the barangay.

To address power shortage/failure, some LGUs came up with RED initiatives. The suitable sites per barangay, including the technology to be adopted and source were identified in Table No. 3-219 below.



**Table No. 3-219: RED PROSPECTS IN VARIOUS LGUS (for verification with MPDC)  
Davao del Norte**

City/Municipality	Technology	Source	Location
Tagum City	Landfill Gas	Solid waste	Brgy. San Agustin
Panabo City	Solar Energy	Solar Heat	Brgy. Cacao
Island Garden City of Samal	1.Solar Energy 2. Landfill Gas	Solar Heat Solid Waste	Talikulud Island, Sampao, San Antonio, Babak District
Asuncion	1.Biomass 2. Solar Power	Fuelwood Solar Heat	Slaughter house, Cambanogoy Brgy. Cabaywa
Kapalong	1.Biogas System 2.Biomass	Animal Manure Fuel Wood	Brgy. Tiburcia Brgy. Mabantao Kapalong Slaughterhouse
New Corella	Hydropower	Panas Falls	Brgy. Carcor
San Isidro	1.Solar Energy  2. Biogas System  3. Coconut-based Fuels 4. Gasification System	Solar Heat  Manure  Coconut Charcoal	Dacudao, Kipalili, Monte Dujali, Panamuno, Mamangan All barangays Sawate, Mamangan Charcoal-producing barangays
Talaingod	Solar Energy	Solar Heat	Km.25, 31 and far-flung sitios of Brgys, Palma Gil, Dagohoy and Sto. Nino
Sto. Tomas	Solar Power	Solar Heat	Talos Tribal Village, San Jose
Carmen	1.Biogas 2. Densification 3. Coconut-Based Fuels 4. Solar Power	Manure Ricehull Coconut Solar Heat	Yet to be determined
B.E. Dujali	1.Biogas 2. Gasification 3.Solar power 4. Densification	Manure Charcoal, wood Solar Heat Ricehull	Dujali, Cabay-angan, Magupising and Tanglaw Dujali, Cabayangan, Tanglaw Dujali, Tanglaw, Cabayangan, Magupising and New Casay Brgy. Dujali

#### 6.4.5 Solid Waste Management

Solid waste disposal in the province is a vital component in environmental protection and as well as capable of providing for a potential source of renewable energy. The passage of R.A. 9003 otherwise known as Ecological Solid Waste Management Act of 2000 mandated each LGU's Barangays, Municipality/City for the mandatory implementation. Most of the LGUs are considering the prospect of the waste generated as source of renewable energy. Table No. 3-220.

**Table No. 3-220: Quantity of Waste Generated in the Province by Composition, CY 2014.**

Provincial Component LGUs	2010 population	No. of HH	Quantity of Waste Generated (kgs/day)	Waste Composition								
				Biodegradable		Recyclable		Residual		Special Waste		
				Kgs/day	%	Kgs/day	%	Kgs/day	%	Kgs/day	%	

Asuncion	55,844	11,168	28,817.14	20,855.65	72.37	1,582.21	5.49	6,141.39	21.31	237.89	0.83
BE Dujali	28,339	5,667	14,318.38	11,715.23	81.82	1,475.45	10.30	873.43	6.10	254.27	1.78
Carmen	69,199	13,839	22,598.24	17,971.03	79.52	4,007.93	17.74	558.06	2.47	61.22	0.27
IGACOS	95,874	19,174	43,599.74	22,238.63	51.01	9,156.02	21.00	12,061.93	27.67	143.16	0.33
Kapalong	68,261	13,652	25,812.94	16,716.25	64.76	3,040.53	11.78	4,877.21	18.89	1,178.95	4.57
*New Corella	50,699	10,139	28,817.14	20,855.65	72.37	1,582.21	5.49	6,141.39	21.31	237.89	0.83
Panabo City	174,364	34,872	275,869.20	151,865.99	55.05	37,131.99	13.46	75,422.64	27.34	11,310.63	4.10
San Isidro	25,548	5,109	8,116.42	6,499.67	80.08	391.69	4.83	1,211.20	14.92	13.86	0.17
Sto. Tomas	109,269	21,853	37,131.53	27,079.24	72.93	7,928.54	21.35	1,879.09	5.06	244.66	0.66
Tagum City	242,801	48,560	659,876.38	464,225.60	70.35	86,298.28	13.08	103,500.98	15.68	5,851.52	0.89
Talaingod	25,566	5,113	7,694.81	4,415.09	57.38	365.18	4.75	1,847.70	24.01	1,066.84	13.86
<b>TOTAL</b>	<b>945,764</b>	<b>189,153</b>	<b>1,152,651.92</b>	<b>764,438.03</b>	66.32	<b>152,960.03</b>	13.27	<b>214,515.02</b>	18.61	<b>20,600.89</b>	1.79

Note: \* - borrowed WACS data from Asuncion

Source: NSO 2010 Census of Population Report, Waste Garbage Indicators-City ENRO's, MENRO's, MPDO's 2014.

Note: No. of Household HH is computed from 2010 Census of population in an ave. of 5 household size.

The frequency of disposal was performed daily to pick up by garbage trucks. Its level of desegregation is city and barangay. In 2014, Davao del Norte generated a total of 1,152,651.92 kilograms of waste daily. Large amount of quantity of the waste generated mostly come from the three cities of Davao del Norte. And most of waste generated is biodegradable with 66.32 percent, followed by residual with 18.61, recyclable with 13.27 and special waste with 1.79 percent.

#### **6.4.4 Drainage/Flood Control**

##### **a. Drainage System**

The existing drainage network in the province is not sufficient to contain floods especially in the lowland areas. Several measures were already taken such as improvement of the drainage facilities, re-channeling and desilting of creeks and rivers and watershed management which were long term schemes.

However, as urban areas are expanding due to rapid increase in development and population, urban drainage systems remain constant and under sub-standard conditions. Some are of inadequate designs to cater the discharge/volume of water, which aggravate the drainage problem of the area.

##### **b. Flood Control**

Major flood control projects and structures had been constructed by the Department of Public Works and Highways, such as: Libuganon Flood Control, Carmen Flood Control, Tuganay Flood Control, Lasang Flood Control and Tagum Drainage.

Disaster preparedness and management has always been the main concern of the Provincial Disaster Coordinating Council (PDCC). Massive advocacy and capability building programs had been undertaken which were actively participated by the local officials, rescue teams and the general public. Civic and non-government organizations also provided support and active involvement during floods.

*Table No. 3-221: Disaster Data in Davao del Norte, 2011, 2012 & 2013*

Date of Occurrence	Type of Disaster	No. of Mun. / Cities Affected	No. of Brgys. Affected	No. Families Affected	No. of Casualty		No. of Damage House		Total Amount of Damage	
					Injured	Dead	Totally Damage	Partially Damage	Infra.	Crops/Livestock/ Fishery
Dec. 26-29, 2011	Sheet Flood	7	64	14,669	-	-		366,250.00	8,956,250	115,595,477
Jan. 13-16, 2012	Sheet Flood	7	41	13,633		1			1,775,000	88,235,734
Nov. 21-23, 2012	Sheet Flood			5,111		1			681,528	
Dec. 4-7, 2012	Typhoon with Sheet Flood	11	106	43,916	3	1		84,369,620.00	768,269,282	2,810,058,132
Jan. 18-23, 2013	Tail-end of cold front	8		57,538					85,760,000	400,241,718
Feb. 19-21, 2013	Typhoon with Sheet Flood	6	55	32,492		1		3,750,000.00	14,470,000	128,341,499.25
Feb. 20, 2013	Flashflood	2	16	11,707	5	1	2,835,000	8,950,000	3,090,000	8,560,399.25
June 16-17, 2013	Low Pressure Area	8		7,575					22,145,325	4,022,591

Source: PGO, PDC, Davao del Norte

To prepare for the increasing need to rehabilitate the province's major tributaries, the formulation of the integrated master plan and the creation of a management council to rehabilitate the Tagum Libuganon River Basin (TLRB) become an important priority. The river basin covers 306,400 hectares covering 14 municipalities and 1 city in the provinces of Davao del Norte, Compostela Valley and Agusan del Sur. TLRB plays a central role in the economic and ecological viability of Davao del Norte since most of its LGUs are affected by flashfloods when the Libuganon River and its tributaries swell during the onslaught of typhoons and low pressure areas, namely: Asuncion, Carmen, Dujali, Kapalong, New Corella, San Isidro, Sto. Tomas, Tagum City and Talaingod.

Davao del Norte has a total of 407.26 hectares identified as flood prone areas, and represents 45% share in the whole region. The municipality of Carmen has the largest area of 100.93 hectares or 11% share in the flood prone areas of the province.

Flooding problems need both the short term and long term control measures. Provision of flood control measures such as construction of protection dikes, cut-off channels, cross drainage along highways, desiltation of rivers are among the immediate solutions. Since denudation of the vegetative cover has been identified as the main cause of floods, reforestation and watershed rehabilitation programs can be undertaken as long term activities. Agricultural and other economic activities in the upland should also consider the aspect of maintaining a healthy ecological balance in sustaining the ecosystems and preventing environmental hazards.

### **ISSUES AND CONCERNS AND UNDERLYING POSSIBLE CAUSES**

1. Adequate potable water supply has been identified as the most pressing community need. Local water districts, LGU-owned/operated water systems and

water vendors currently provide water supply to the urban area. There are existing water supplies which are sourced mainly from ground water and this source has been found to be inadequate to meet the existing and future need of the province. Moreover, the local government has initiated a collaborative effort between LGUs, water districts and other stakeholders through the Project Development Facility. Result of the feasibility study indicates a need for a development of a bulk water facility.

2. Although all the barangays in the province are covered with energization program only 78.3% of the potential households were energized. The present power supply does not assure the future need of the province especially with the rapid demand of energy for commercial and industrial use.

### **GOALS**

1. Improved access to other basic infra utilities and facilities.

### **OBJECTIVES**

1. To increase Households access to Potable Water by 90% in 2012 to 95% by 2018.
2. To increase supply of power generated in the province
3. To increase the number of households energized by 100% from the 2013 baseline.

### **STRATEGIES**

1. Implementation of Integrated Water Resource Development Program thru public private partnership.
2. Pursue aggressive identification, promotion and development of potential renewable energy sources, including the utilization of solar energy

### **PROGRAMS, PROJECTS AND ACTIVITIES**

1. Establishment of an integrated water system facility
2. Conduct of Governance Forum with potential partners and stakeholders
3. Investment promotion program of the water resource Development Program.
4. Implement rainwater harvesting facilities development programs for non-potable use
5. Construction/Establishment of water supply systems
6. Conduct of preliminary technical studies on identified potential renewable energy sources
7. Conduct of investment promotion activities for the development of identified potential renewable energy sources
8. Construction/Installation of 15 MW EEI Heavy Fuel Oil Power Plant (private sector led investment) as embedded power for Davao del Norte Electric Cooperative
9. Provide/Install additional power generator set for Talicud Island in IGACOS

#### **6.4.6 Other Services**

Disaster is a serious disruption of the functioning of community. During disasters, information is as much needed as water, food and medicine. Information and communication thus can be considered as among the lifeline. In time of calamities, we need effective information and communication technology for disaster management.

It is important that the necessary community services are made available in the province, for everyone to enjoy a full and active life. There should be easy access to excellent modern health and social care services. Everyone should have access to the opportunities and facilities they need to realize their personal, academic and professional goals.

#### a. Communication Services

Efficient and adequate communication facilities are vital to the province's effort towards development. The fastest way to connect the province to other province in the region and in the country and to the rest of the world is through a well-developed communication system, with facilities and services that are affordable and accessible to people and business.

Davao del Norte is not far among other developed provinces in terms of services and facilities development. However, if other country of which is highly developed in technology as a benchmark, we are outlying in terms of development and services.

A communication service is necessary to participate and become globally competitive in economic activity. It is encouraged that private sector will lead these undertakings.

On the other hand, communication services play a vital role in disaster management. Among the communication equipment which is very essential is the acquisition of two-way radio for immediate use and action of responders to calamity victims. This must be a concerted effort of LGUs, private and non-government organizations and the general public.

The Provincial, City , Municipal and Barangay Disaster Risk Reduction and Management (DRRM) are now well equipped with two way radios to immediately respond during disaster occurrences.

As shown in Table No. 3-222, there are 617 functional handheld radios in the different DRRM while there are 57 radio bases in 11 LGUs including the PDRRM. Kapalong has the most number of handheld radios while Asuncion has the least. For radio base, Carmen has the most number of radio base while Asuncion has the least. These communication equipments play vital role for the responders to immediately address the needs of the disaster victims.

**Table No. 3-222: Existing/Functional DRRM Hand Held Radios  
Davao del Norte, 2014**

LGU DRRM	No. of Hand Held Radio	Radio Base
PDRRM	54	10

Asuncion	155	2
Carmen	10	21
Dujali	19	3
IGACOS	50	3
Kapalong	155	2
New Corella	50	1
Panabo City	15	2
San Isidro	35	1
Sto. Tomas	50	5
Tagum City	100	5
Talaingod	76	3
<b>Total</b>	<b>617</b>	<b>57</b>

Source: PDRRMD, Davao del Norte

### **b. Broadcast Media**

Radio and television remain the traditional media used in disaster management, because they are relatively cheap that provide a reliable one-to-many communication medium. Radio in particular is most accessible medium to the poor, especially women in their homes, or fishermen at sea, workers out in the fields.

Davao del Norte has one (1) commercial radio station, the UMBN-DXDN, An amplified modulation radio station located at Tagum City, It covers not only in Davao del Norte but also in Compostela Valley Province and reaching secondary areas like Davao Oriental, Davao del Sur, Davao City and even in Bukidnon Province. On the other hand, there are already three (3) Frequency Modulated (FM) radio stations located at Tagum City with very good signals reaching all over the province and even in other near provinces.

Moreover, three (3) cable networks cater Davao del Norte namely; The North Cable Vision, Home Channel Network and the Dream Satellite Cable Network. Most subscribers of these networks are located in urban areas; however the Dream Satellite Network subscribers are not limited to urban areas it reaches to the rural areas since the network is using through the satellite broadcasting.

### **c. Telephone and Telegraph Stations Services**

Telephone and telegraph stations services are useful in disseminating disaster warnings. Mobile phones were the main tool for implementing a community-based flood monitoring and early warning system. Short message service (SMS), a feature available in most mobile phones is an additional tool for delivering one-to-many text-based disaster alerts.

The usefulness and the limitations of mobile phones in crisis situations need to be addressed. Survivors who are stranded commonly use mobile phones to guide rescue teams to where they are, and report to local officials of their immediate needs, and local television and newspaper, their plight.



Davao del Norte is also fast advancing in terms of communication facilities. Major telephone lines like SMART Broadband, DATELCO, DOTC-TELOF and PhilCom are servicing several parts of the province. However operational areas are concentrated in the urban areas in some municipalities and cities. Advance information technology such as electronic mail and cellular phone companies are also available in the province. Internet café's are now a fast growing business in the province, except in the upland areas.

*Table No. 3-223: Number of Landlines Telephone Subscriber  
Province of Davao del Norte, As of April, 2012*

Service Area	Type of Exchange	Equipped Capacity	Installed Lines	No. of Subscribers	Household Population	%
Tagum City DOTC-TELOF DGCI SMART Broadband	Landline	2,120 2,500 -	2,120 2,300	546 1,921 4,316	34,561	19.63 1.58 5.55 12.49
Panabo City PhilCom	Landline	3,788	3,700	656	30,061	2.18
Asuncion DOTC-TELOF	Landline	800	800	48	10,715	0.44
Kapalong DOTC-TELOF	Landline	848	848	211	12,779	1.65
Sto Tomas DOTC-TELOF PhilCom	Landline	800 1,336	800 1,700	5 393	15,861	0.031 2.48
Carmen PhilCom	Landline	-	10	5	12,597	0.039

Source: DOTC-TELOF, DGCI, PhilCom and SMART Broadband

SMART Broadband was formerly the CRUZTELCO has the highest number of subscribers, having 19.63% concentrated only in Tagum City.

The use of cellular phones is becoming more convenient to the people in the province, because of the series of cell sites that constructed in the upland areas, thus contributes to low subscription of landlines telephones.

#### **d. Internet and e-Mail**

The internet is acknowledge to be one of the most reliable information infrastructure even under adverse conditions and electronic mail is most widely used application.

However, the struggle of finding a good internet service provider proves to be a real challenge. It has been reported that the Philippines has the slowest and most expensive internet in the region and this also proves to be also a challenge in Davao del Norte. At present, providers are expanding their services in Davao del Norte. These are Globe, Smart/PLDT, Bayantel (DSL) and Sky (Cable).

#### **e. Publications**

National newspapers and magazines are accessible in the province since these are available daily in most urban areas of each municipalities and cities, while local newspapers are available on twice weekly or in a weekly basis. The local publication that circulates in the province are Trends and Times, Medianet Balita, Ang Tanlag sa Lungsod, Periodico Norte, Sidlak Dabaw Daily News, The Mindanao Newscaster, Goldstar News, Mindanao Truck News, The Davao Times, Image Freedom News, Dabao Gold Balita and even other local publication from different provinces circulates in Davao del Norte.

There are two (2) newsletters being published by the province namely: The Executive Reports now the DavNor Karon and the Legislative Updates. These newsletters are official publications of the Province of Davao del Norte to update the local constituents of the various undertakings, developments, news and other important information of the provincial government of Davao del Norte.

#### **f. Mailing/Postal Services**

At present, Postal District Office is positioned at Tagum City. At present, there are 26 administrative personnel in the office which covers and serves the whole province of Davao del Norte and partly in the province of Compostela Valley and Davao Oriental. (Refer to Table 15). Mail and deliveries are made daily by a mail car from the regional post office in Davao City. However, the use of cellular phone text messaging communication has obviously reduces the volume of letters that letter carriers delivered everyday.

**Table No. 3-224: Postal Personnel to Population by Municipality,  
Davao del Norte, as of 2008 & 2012**

City/ Municipality	No. of Personnel		Number of Letter Carrier		Population		Ratio	
	2008	2012	2008	2012	2008	2012	2008	2012
District Office	2	1	-	-	-	-	-	-
Tagum City	31	15	14	14	215,967	253,365	1:6,966	1:8737
Asuncion	3	1	1	1	50,731	57,828	1:16,910	1:28,914
B.E. Dujali	-	-	-	-	-	29,710	-	-
Carmen	2	1	1	1	61,656	72,165	1:30,828	1:36,083
Dapecol	1	1	-	1	-	-	-	-
Kapalong	5	1	3	1	61,763	70,790	1:12,352	1:35,395
San Isidro	1	-	-	-	-	25,865	-	-
New Corella	2	1	1	1	46,311	52,396	1:23,155	1:26,198
Panabo City	10	3	6	6	154,329	182,277	1:15,432	1:20,253
Sto. Tomas	4	1	2	2	97,210	114,016	1:24,302	1:38,005
IGaCoS	-	1	-	2	90,291	97,989	-	1:32,663
<b>Total</b>	<b>61</b>	<b>26</b>	<b>28</b>	<b>29</b>	<b>778,258</b>	<b>984,560</b>	<b>-</b>	<b>1:6,153</b>

Source: Philippine Postal Corp. (Davao del Norte / ComVal) Postal District Office & NSO 2007 & 2010 Census of Population.

The emergence of mobile phone communication in the province has affected the operation of the local post offices. It has been noted that the volume of letters from the sending public had drastically reduced, thereby weakening its earning capacity and reducing the administrative personnel of the postal district office.

In Tagum City and some other Cities and Municipalities, private forwarders such as LBC Express Inc., JRS, Palawan, DHL, ToGo, Cebuana Pera Padala, Western Union, RD Pawnshop and ML Lhuiller are augmenting the services of the post offices.

### **g. Disaster/Emergency Operation Centers**

At present, disaster and emergency operations center is set up within the vicinity of the government center where weather forecast and earthquake intensities are detected. Various water monitoring devices are installed in strategic places along major river banks. Table No. 3-225. Meanwhile seismograph equipment or an accelerograph is also available and made use at the Provincial Disaster Risk Reduction and Management Operation Center.

**Table No. 3-225: Inventory of Rain Gauge Facilities**

Davao del Norte, CY 2014

City/Municipality	Barangay	Type
Asuncion	Cambanogoy	Water level and rain gauge 2
B.E. Dujali		Rain gauge 2
Kapalong	Maniki	Water level and rain gauge 2
New Corella		Automated rain gauge
Panabo City	Davao del Norte State College	Rain gauge 2
Sto. Tomas	Menzi Bridge, Brgy. Tibal-og	Water level and rain gauge
Tagum City	PDRRM Office, Mankilam	Automated rain gauge
	Pangi Bridge, Apokon	Water level and raing gauge 2
Talaingod	Sitio Cabadiangan, Sto. Nino	Automated rain gauge
	Municipal hall, JBL, Brgy. Sto. Nino	Automated rain gauge
	Nanaga Bridge, Brgy. Sto. Nino	Water level and raing gauge 2

Source: PDRRMD-PGO

Adequate infrastructure facilities must be in place to accommodate the needs created by new developments, and should be located in the most appropriate locations to allow for the efficient use of it.

### **ISSUES AND CONCERNS**

1. Critical facilities affected by various hazards.
2. Low access to information and communication facilities and technologies

### **POSSIBLE CAUSE**

1. Poor planning
2. Wireless communication systems and internet connections are found only in urban areas

### **GOALS**

1. Ensure adaptability and resiliency of critical facilities and lifelines safe from various hazards (floods, landslides, sea level rise and storm surges)
2. Enhanced quality of information and communication services

### **OBJECTIVES**

1. To improve the capacities of all LGUs in the enforcement of policies and implementation of Programs, Projects and Activities for safer Environment and better Disaster Risk Mgt. by 2022.
2. To intensify access to information and communication facilities and technologies in rural areas by:
  - Providing all barangays with appropriate ICT facilities
  - Increasing the total number of cell sites in rural areas

### **STRATEGIES**

1. Assess, protect and strengthen critical facilities, lifelines and physical infrastructures to mitigate impacts of floods, landslides, sea level rise and storm surges
2. Aggressive promotion of the PPP scheme to increase the construction/provision of critical infrastructure facilities
3. Integrate disaster resilient and climate-proof design in infrastructure facilities, including community health centers, especially those being used as evacuation centers during times of natural and man-made disasters
4. Expand ICT infrastructure such as cell sites, CATV and broadband internet connectivity
5. Establish tele-center or community e-centers in all cities and growth centers
6. Modernize public telecommunication facilities and postal operations in the LGUs including public calling offices and internet facilities

### **PROGRAMS, PROJECTS AND ACTIVITIES**

#### **a. Disaster Prevention and Mitigation Program**

- Flood Control and Slope Protection Project
- Agricultural Development Project
- Environmental Protection and Management Project
- Data and Information Management project

#### **b. Disaster Preparedness Program**

- DRR-CCA Promotion, Awareness and Advocacy Project
- Emergency Preparedness Project

#### **c. Disaster Response Program**

- Emergency response and Assistance Project
- d. Disaster Rehabilitation and Recovery Program**
- Building Back Better Project

## 6.5 Poverty

As defined in the National Strategy to Fight Poverty by the UN Joint Consultative Group on Policy, Poverty connotes a deprivation to a social standard, or the lack of the minimum entitlements of households in society which the government must seek to provide, either directly or indirectly.

In Region XI, all of the provinces, except Davao del Sur, posted decline in poverty incidence among families. Davao del Sur recorded an increase of 0.7 percentage point in poverty incidence from 19.3 percent in 2009 to 20.0 percent in 2012. Davao Oriental had the largest drop in poverty incidence with poverty incidence of families dropping by 6.5 percentage points in 2012. The province, however, had the highest number of poor families in 2012, with 38 out of 100 families classified as poor.

Meanwhile, the number of poor Davaoeños, or the poverty incidence among population, also posted a slight decline from 31.4 percent in 2009 to 30.7 percent in 2012, a difference of 0.7 percentage point between the two periods. Table No. 17.

Davao del Norte recorded the highest increase in poverty incidence among the population. Incidence of poor population in the province increased to 33.4 percent in 2012 from 32.0 percent in 2009, which corresponds to a 1.4 percentage points increase. Davao Oriental, experienced the largest drop in poverty incidence among population from 54.4 percent in 2009 to 45.8 percent in 2012.

A Davaoeño needed PhP1,158 in 2012 to meet his/her monthly food requirements and PhP1,664 to stay out of poverty. A family of five needed a monthly income of PhP5,788 to meet its basic food needs and PhP8,320 to stay out of poverty and to sustain their food and non-food needs.

Table No. 3-226 showed the poverty incidence of Families and Population, Region XI by Province: 2006, 2009 and 2012

**Table No. 3-226: Poverty incidence of families and population  
Region XI, 2006, 2009, 2012**

Region/Province	Poverty Incidence among Families (%)			Inc/Dec		Poverty Incidence among Population (%)			Inc/Dec	
	2006	2009	2012	06-09	09-12	2006	2009	2012	06-09	09-12
Region XI	25.4	25.5	25.0	0.1	(0.5)	30.6	31.4	30.7	0.8	(0.7)
Davao del Norte	26.2	27.2	26.7	1.0	(0.5)	31.7	32.0	33.4	0.3	1.4
Davao del Sur	19.6	19.3	20.0	(0.3)	0.7	23.7	24.8	24.4	1.1	(0.4)
Davao Oriental	42.7	44.3	37.8	1.6	(6.5)	50.5	54.4	45.8	3.9	(8.6)
Compostela Valley	31.3	31.0	30.7	(0.3)	(0.3)	37.7	36.6	36.7	(1.1)	0.1

Source: PSA

In terms of annual per capita poverty threshold, a person in Davao del Norte needs a yearly income of PhP 20,841 in 2012 in order to meet the minimum basic needs. A family of five would therefore need an annual income of PhP104,205.00.00 or a monthly income of PhP8,683.75. Table No. 18.

The annual per capita threshold for Davao del Norte has increased by 23.6% from PhP16,863.00 in 2009 to PhP20,841.00 in 2012.

**Table No. 3-227: Annual Per Capita Poverty Threshold and Food Thresholds for a Family of Five**

Davao del Norte: 2006, 2009 and 2012

Indicator	Annual Per Capita Threshold			Inc/Dec	
	2006	2009	2012	06-09	09-12
Poverty Threshold	13,214	16,863	20,841	3,649	3,978

Source: PSA

Based on the municipal level small area estimates made by the National Statistical Coordination Board in 2012, the municipality of Talaingod has the highest number of poverty incidence at 68.8 per 100 families followed by San Isidro at 43.2% and New Corella at 41.6%.

Data from the NSCB below showed that that Municipality of Talaingod has the highest poverty incidence at 78.56 % followed by Kapitalong at 51.28% and New Corella at 49.62%. As a whole the poverty incidence of the province is 52.48 percent.

**Table No. 228: Poverty Incidence by City/Municipality**

Davao del Norte, 2006 and 2012

CITY/ MUNICIPALITY	POVERTY INCIDENCE Per 100 Families	
	2006	2012
Asuncion	50.72	39.2
Braulio E. Dujali	31.98	29.4
Carmen	41.59	26.7
IGaCOS	-	28.5
Kapalong	50.23	33.4
New Corella	50.59	41.6
Panabo City	-	16.6
Sto. Tomas	32.67	21.7
San Isidro	-	43.2
Tagum City	-	13.8
Talaingod	69.35	68.8

Source: PSA,, Estimation of Local Poverty in the Philippines

While the data of DSWD-NHTS revealed that out of the 112,227 households administered, a total of 58,934 are assessed as poor.

Poverty incidence in Davao del Norte has been increasing for the last two (2) reporting periods and has been demonstrating higher occurrences than the regional and national data. Increasing poverty incidence cuts across all sectors in development and must be afforded necessary and appropriate action.



**Table No. 3-229: Poverty Incidence and National Household Targeting System (NHTSPR)  
Davao del Norte, CY 2012-2014**

City/ Municipality	Poverty Incidence (NSCB Data)	No. of HHs Assessed through NHTSPR	No. of Poor HHs from NHTSPR	Provincial Share	Municipal / City Share (percentage of HHs assessed)
Asuncion	44.94	10,142	6,053	10.27%	59.68%
BE Dujali	36.22	2,620	1,440	2.44%	54.96%
Carmen	32.07	8,456	4,225	7.17%	49.96%
IGaCoS	44.48	14,978	7,914	13.43%	52.84%
Kapalong	51.28	13,884	6,571	11.15%	47.33%
New Corella	49.62	9,517	5,598	9.50%	58.82%
Panabo City	22.74	15,720	7,212	12.24%	45.88%
San Isidro	-	11,193	5,392	9.15%	48.17%
Sto. Tomas	26.3	11,193	5,392	9.15%	48.17%
Tagum City	15.42	15,247	7,393	12.54%	48.49%
Talaingod	78.56	5,315	3,975	6.74%	74.79%
<b>TOTAL</b>		<b>112,277</b>	<b>58,934</b>	<b>100.00%</b>	

Source : PSWDO

Among the cities and municipalities, IGaCOs has the highest magnitude of poor households followed by Tagum City with 7,914 and 7,393 respectively, while San Isidro and Talaingod has the lowest magnitude of poor households with 3,975 and 3,161 respectively.

But out of the total assessed households per LGU, Talaingod has the highest number of poor households out of 5,215 HHs assessed, 74.79% or 3,975 were considered poor while Kapalong has the lowest, out of the total 13,884 HHs assessed 47.33% or 6,571 were assessed as poor.

**Table No. 3-230: Pantawid Pamilyang Pilipino Program Beneficiaries  
Davao del Norte, 2012-2014**

City/Municipality	2012	2013	2014
Asuncion	4,200	4,903	4,285
BE Dujali	1,123	1,275	1,144
Carmen	3,196	3,583	3,149
IGaCoS	5,568	6,396	5,652
Kapalong	4,264	5,319	4,231
New Corella	3,955	4,655	4,072
Panabo City	4,565	6,038	5,060
San Isidro	2,089	2,374	2,047
Sto. Tomas	434	4,523	3,552
Tagum City	5,507	6,613	5,652
Talaingod	1,875	3,465	2,679
<b>TOTAL</b>	<b>36,776</b>	<b>41,527</b>	<b>45,859</b>

Source : PSWDO

Considering the growing magnitude of poverty in the province, there were reported increasing number of Pantawid Pamilyang Pilipino Program also known as 4Ps beneficiaries from 36,776 in 2012 to 45,859 households benefited. A total of amount PhP1.3 billion in 2014 was disburse in Davao del Norte. The families were given PhP1,400 cash assistance every two months for the whole year.

The 4Ps also helps the Philippine government fulfill its commitment to the Millennium Development Goals (MDGs)—specifically in eradicating extreme poverty and hunger, in achieving universal primary education, in promoting gender equality, in reducing child mortality, and in improving maternal health care.

## 7.0 LAND USE AND PHYSICAL FRAMEWORK

### 7.1 Existing land use, trends and potential expansion

#### 7.1.1 Existing land Use

Existing land use is defined as the way in which an area of land is actually being put to use, e.g. to grow rice, to build houses on, to put up industry; this is the impact of people and structure upon the land.

Existing land uses in the province is presented in Table 3-169 and are categorized into the following:

- a. Production areas
- b. Protection areas
- c. Built-up/settlement areas
- d. Infrastructure and Utilities

#### a. Production Areas

##### 1. Agriculture

Agriculture lands as defined are those lands that are extensively used for crop production. They are intended for the production of cash crops, sustenance crops, medium term and long term crops.

The Province is basically an agriculture province endowed with rich and fertile soil, and favorable climate suited for agriculture production. About 56.46 percent or 195,511.55 hectares are devoted to agriculture and aquaculture production. Major crops planted in the province, as presented in Table 3-23 (Agriculture Profile) are the following:

- Rice is produced in all cities and municipalities. Major production areas are the municipalities of Asuncion, New Corella, Kapalong, Carmen, B.E Dujali and Sto. Tomas. Total area devoted for rice production, irrigated and non-irrigated, is placed at 18,566.11 hectares.
- Coconut trees cover an extensive area in the Island Garden City of Samal (IGCS). Except in BEDujali and Kapalong, all other cities and municipalities have more than a thousand hectares planted to coconut. Area planted to coconut is about 42,295 hectares. Some coconut areas are intercropped with other crops; most common of which is with local banana cultivars like cardava and saba.
- Cavendish banana production is one industry that propels the economy of the province. The commodity is planted in approximately 31,484.53 hectares. It is cultivated in most municipalities and cities, except in San Isidro and in the Island Garden City of Samal. Major producer of Cavendish banana are Kapalong, Sto.

Tomas, Carmen, B.E Dujali and the cities of Panabo and Tagum. On the other hand, other varieties of banana such as cardava, lakatan, saba and other cultivars are planted in 24,477.90 hectares. Cardava bananas grown in 10,217 hectares, are processed into chips and are sold in local and export markets.

- Mono-crop cultivation of corn is around 8,475 hectares. New Corella, Kapalong, Talaingod and Asuncion are the major sources corn. The white variety, which is consumed for food, is the dominant variety. Yellow corn is intended to be processed into feeds. There are also areas grown with corn and being intercropped with other commodities such as banana or under coconut.
- Cacao is a promising export commodity of the province. Davao del Norte is a major cacao producing province in the country that has a production area of 6,307 hectares. The municipality of San Isidro has the biggest area planted with cacao at 4,061 hectares, having a share of 64% of the total cacao production area in the province. Cacao is usually intercropped with coconut and cardava-banana, as cacao thrives well with partially shaded environment.
- Mango is produced in 4,876 hectares with the Island Garden City of Samal contributing the biggest production area at 2,718 hectares. IGCS has generally a Bolinao clay (corraline) soil structure coupled with define dry season which is suited to mango production. There are also some areas in Panabo City where mango grows well.
- Inland aquaculture/fishpond development occupies an area of 2,021.50 hectares. Large fishpond is found in the municipalities of Carmen and B.E Dujali and in the cities of Tagum and Panabo.

## 2. Production Forest

Forestlands are lands on which the vegetation is characterized by more or less dense and extensive tree cover. It includes those lands from which trees have been harvested with the intent to maintain the land for tree production and others to set aside for the protection to preserve other valuable resource. In Davao del Norte, DENR-PENRO classified 135,718.21 hectares as forestland areas, composed of the production and protection forests.

In Table 3-169, approximately 74,944.70 hectares of the forestland areas or 21.64% of the province' land area, are classified as production forests. Production forest is composed of the residual forest, the brushland and grasslands, tree plantations and some areas cultivated with crops and perennial tree crops. It is estimated that 3,631.22 hectares or 2.70% of the forestland are residual forest which are logged-over areas, 20,982.97 hectares (28.0% of the production forest) classified as brushland and grasslands. Brushland and grasslands areas can be utilized for agriculture plantations development. Tree plantation is about 42,717.49 hectares or 57% of the total production forest. Tree plantations area mostly planted with agro-forestry products,

which are covered under the Integrated Social Forestry Program of PENRO- LGU and the Community-Based Forest Management Program of the DENR. Around 7,612.68 hectares of the production forests are cultivated to agricultural commodities like fruit trees and other perennial crops. Production forest are those areas where harvesting is allowed.

There have been efforts for the development and rehabilitation of production forests in the province. Both the Department of Environment and Natural Resources and Local Government Units have been in the forefront in the implementation of programs and projects on such concern, with the able participation of communities. Table No. 3-231 show the accomplishments of programs implemented by the DENR and the Provincial Government on forest plantation development.

*Table No. 3-231: Forest Plantation Development, By Program, By City/Municipality  
Province of Davao del Norte, as of 2013 (in hectares)*

<b>City/ Municipality</b>	<b>Integrated Social Forestry Program (PENRO-LGU)</b>	<b>Community-Based Forest Management Program (CBFM-DENR)</b>	<b>Industrial Forest Management Agreement (IFMA- DENR)</b>	<b>Forest Land Management Agreement</b>
Asuncion	47.00	<b>3,311.00</b>	0	<b>78.00</b>
Carmen	33.00	0	0	
Kapalong	<b>488.00</b>	<b>15,200.00</b>	<b>9,196.00</b>	<b>315.00</b>
New Corella	<b>115.00</b>	<b>2,932.00</b>	0	
San Isidro	<b>222.30</b>	0	0	
Sto. Tomas	121.0	0	0	<b>70.00</b>
Talaingod	<b>281.50</b>	0	<b>9,857.00</b>	<b>445.37</b>
Panabo City	0	0	0	
<i>Davao del Norte</i>	<b>1,307.80</b>	<b>21,443.99</b>	<b>19,053.00</b>	<b>908.37</b>

*Source: DENR, PENRO-LGU, Davao del Norte*

### **3. Mining Areas**

Davao del Norte have rich deposits of non-metallic minerals like limestone, sand and gravel and others. It has a total reserve of 44,845,283 M.T of non-metallic minerals. Of these non-metallic minerals, sand and gravel of high quality grade, a major component material in construction is extracted in the province. Major producers of sand and gravel are the cities of Panabo and Tagum (Table No. 3-35).

### **4. Industrial Development Areas**

In the pursuit of transforming the Province from merely a source of raw materials into becoming a producer of high quality manufactured and processed products, the creation of Tagum City and Panabo City as Provincial Agro-Industrial Centers is expected to boost prospects in the local economy.

The Panabo PAIC, a 540 hectare industrial site is expected to benefit other municipalities in the second district of the province as its influence areas. While the 635 industrial

estate, that includes areas for residential and eco-tourism development, allocated in Tagum City is expected to propel growth not only in Tagum but in other municipalities of the province as well. These areas are found feasible for the location of industrial establishments, such as manufacturing/processing firms, and support facilities. An industrial estate of 25 hectares is located in Madaum, Tagum City.

## 5. Tourism Areas

Areas with potential for tourism development are found in the Island Garden City of Samal as well as in the mainland. Samal boast of its white sand beaches and islets that is excellent for scuba diving and snorkeling, while springs, caves and other inland resorts are some of the attractions found in the mainland. An area of 670.56 is devoted for tourism. Also, a mariculture park in the Island Garden City of Samal and Panabo City is being promoted as one of the agri-tourism sites in the province.

### b. Protection Areas

Protection land is a portion of land and water set aside for its unique physical and biological diversity and protected against destructive human influences or impacts.

Protection refers to the rehabilitation, conservation and sustainable development and management of certain categories of land and water resources known as protection lands.

Protection land use involves a concept of protection that enhances not only those that have to be protected from human occupation because of the destructive effect, such occupation, will have on the resource but also due to the hazard posed by the area to the human occupants. Hence, dual objective of maintaining protection land is to protect sensitive and critical ecosystem from human intrusion so as to preserve their integrity, and at the same time allow degraded areas to regenerate as well as to protect human population from environmental hazards.

Davao del Norte's protection lands include the Network of Integrated Protected Area Systems (NIPAs) of the mangrove swamp forest reserve in Babak, and the Non-NIPAS which include the Network of Protected Areas for Agricultural Development/Strategic Agriculture and Fisheries Development Zone (NPAAD/SAFDZ).

#### 1. NIPAS Areas

The National Integrated Protected Areas System (NIPAS) was established under Republic Act No. 7586. Protected areas categorized under NIPAs are: 1) strict nature reserve, 2) national park, 3) natural monument, 4) wildlife sanctuary, 5) protected landscape and seascape, 6) resource reserve, 7) natural biotic, and other categories established by law, conventions or international agreements which the Philippine Government is a signatory.



NIPAS areas in Davao del Norte is the 7,656 hectares Samal Island Protected Landscape/Seascape which was proclaimed under Proclamation No. 2152.

## 2. Non-NIPAS Areas

- a. Non-NIPAS areas include the second growth forest (PD 705), mangrove and fish sanctuaries (RA 8435 & RA 8550), buffer strips and easements (PD 705 & PD 1067), salvage zones along foreshore lands (PP 2146), freshwater swamps and marshes (PP 2146), environmentally critical areas (PD 2146), protected agricultural areas (RA 8435 & RA 8048) and other protected areas.

In Davao del Norte, Non-NIPAS areas cover second growth forest above 1000 m. elevation or more than 50% slope, mangrove forest and buffer strips along rivers and escarpments. Approximately, 47,758.83 hectares are under this category of protection lands.

### b. SAFDZ/NPAAD Areas

Strategic Agriculture and Fisheries Development Zones (SAFDZ)/ Network of Protected Areas for Agricultural Development (NPAAD) under RA 8435 (Agriculture and Fisheries Modernization Act) area in the province is accounted at 132,382 hectares. In SAFDZ classification, 125,847 hectares or 95.1 % are identified as Strategic Crop Sub-Development Zone, 3,861 hectares or 2.9 % as Strategic Fishery Sub-Development Zone, 2,120 hectares or 1.6 % as Integrated Strategic Crop/Livestock Sub-Development Zone, while Integrated Strategic Crop/Fishery Sub-Development Zone is approximately 554 hectares or 0.4 %. Total SAFDZ area of the province is 21.6 percent of the region.

Network of Protected Areas for Agricultural Development (NPAAD) classify some agricultural lands to be “protected” against any irreversible conversions such as into urban/non-agriculture use. The main purpose of such protection is to keep and preserve the highly suitable agricultural lands for long-term food security of the nation. In addition, these lands are usually supported by large investment in agri-infrastructures. Some NPAAD in Davao del Norte covers agricultural lands that are ecologically fragile. A detail of SAFDZ areas in the province is presented below.

Table No. 3-232 : Areas of Strategic Agriculture and Fisheries Development Zone (SAFDZ)  
By City/Municipality, Davao del Norte, 2013 (in hectares)

City/Municipality	Strategic Crop Sub-Development Zone	Strategic Fishery Sub-Development Zone	Integrated Strategic Crop/Livestock Sub-Development Zone	Integrated Strategic Crop/Fishery Sub-Development Zone	Total
Asuncion*	8,277	0	48	12	8,337
B.E Dujali	6,052	2,660	0	0	8,712
Carmen	16,484	51	225	150	16,910
Kapalong*	11,629	0	32	0	11,661
New Corella	15,978	34	365	0	16,377
Sto. Tomas	18,750	0	0	0	18,750
Talaingod	1,475	0	0	0	1,475
IGC of Samal	23,371	0	0	0	23,371
Panabo City	13,231	138	31	0	13,400
Tagum City	10,600	978	1,419	392	13,389
<b>Davao del Norte</b>	<b>125,847</b>	<b>3,861</b>	<b>2,120</b>	<b>554</b>	<b>132,382</b>
% Share	95.1	2.9	1.6	0.4	100

Source: BSWM-XI

\* including data for San Isidro

### c. Primary (Old) Growth Forest

Primary (old) growth or protection forests of 60,773.52 hectares are found in all the municipalities and cities of the province. These areas have to be protected through implementation of efficient and sustainable forest management scheme. Primary growth forest which consist of old growth and mossy forest are located in areas with slope of above 50% and elevation of 1000 meters above sea level (masl) or more. Kapalong and Talaingod had the most of the old growth forests that need to be protected.

### d. Mangroves and Fish Sanctuaries

The province has a total mangrove area of 208.56 hectares. Among the coastal areas of the province, Panabo City has the largest area planted with mangrove with 82 hectares. Table No. 3-166 indicates the areas of mangrove, seagrass and coral reefs in the province.

Table No. 3-233: Areas of Mangrove, Seagrass and Coral Reef in Davao del Norte  
By City/Municipality, As of October 2005 (in hectares)

City/Municipality	Mangrove	Sea-grass	Coral Reef
IGC of Samal	63.56	7.50	95.00
Panabo City	82.00	15.00	10.00
Tagum City	3.00	1.00	1.00
Carmen	60.00	5.00	6.00
Davao del Norte	208.56	28.50	112.00

Source: RPPF, Region XI, 2003-2030

**e. Agrarian Reform Areas**

The acquisition and distribution of agricultural land is undertaken through PD 27 and RA 6657 of the Comprehensive Agrarian Reform Program (CARP).

Davao del Norte has areas earmarked 71,772 hectares for land distributions under the agrarian reform program in pursuance to RA 6657. This is 20.73 percent of the total land area of the province. As of 2014, 68,664 hectares or 95.70 percent of the target were already awarded to farmer-beneficiaries. As of 2014, the Department of Agrarian Reform is yet to distribute 3,108 hectares to qualified beneficiaries.

*Table No. 3-234 : Cumulative Accomplishment on Land Acquisition and Distribution  
By City/Municipality, Davao del Norte, as of 2013 (in hectares)*

City/Municipality	Lands for Distribution	Lands Distributed	Balance	Percentage of Accomplishment
Asuncion*	13,782	13,454	328	97.62
Carmen	5,745	5,466	279	95.14
Kapalong**	9,407	9,146	261	97.23
New Corella	5,158	4,895	263	95.00
Sto. Tomas***	16,561	16,002	559	96.62
IGC of Samal	7,999	7,187	812	89.85
Panabo City	7,790	7,513	277	96.89
Tagum City	5,330	5,001	329	96.44
Davao del Norte	71,772	68,664	3,108	95.70

*Source: DAR-Provincial Office, Davao del Norte*

*Note: covering only lands issued with CLOA and its corresponding ARBs*

*\* includes data for San Isidro*

*\* includes data for Talaingod*

*\* includes data for B.E Dujali*

To empower the agrarian reform beneficiaries and increase farm productivity and household incomes, the strategy of developing agrarian reform communities was followed. There are 27 Agrarian Reform Communities (ARC) organized in the province as of year 2014. These ARCs have a total of 36,078 beneficiaries who are recipients of the land tenure improvements and program beneficiary development interventions. Among the municipalities in the province, Panabo City has the most number of ARCs at 5 while the Municipalities of B.E Dujali and Talaingod have the least number of ARCs with only one. ARCs cover 48,250.30 hectares. Table No. 3-167 show the distributions of the ARCS in the province.

*Table No. 3-235 : Distribution of Agrarian Reform Communities, By City/Municipality  
Province of Davao del Norte, 2013*

City/Municipality	No. of ARCs	No. of Beneficiaries	No. of Barangays Covered	Area Coverage (in hectares)
Asuncion/San Isidro	3	5,013	17	9,658.2122
B.E Dujali	1	1,085	4	2,163.6612
Carmen	3	2,954	9	3,580.3284
Kapalong	2	6,124	7	6,570.3397

New Corella	2	2,870	11	3,127.5313
Sto. Tomas	2	8,077	17	10,323.9815
Talaingod	1	461	3	878.8250
IGC of Samal	4	2,167	16	3,490.2153
Panabo City	5	4,368	15	5,113.1406
Tagum City	3	2,959	10	3,344.0619
Davao del Norte	27	36,078	109	48,250.2971

Source: DAR-Provincial Office, Davao del Norte

#### **f. Military and Civil Reservation Areas**

Davao Penal Colony (Dapecol) with an area of 28,816 hectares is the only military and civil reservation in the province. The area was declared as such through Proclamation No. 414 on October 7, 1931. Most of these areas, however, are now utilized for agricultural purposes, particularly banana plantation and only about 8,880 hectares are actually used by the penal colony.

#### **g. Ancestral Domain Areas**

Ancestral domain (AD) areas are located in the Municipalities of Talaingod, Kapalong, San Isidro, Asuncion, New Corella, Sto. Tomas, and in the Island Garden City of Samal. The major indigenous people's groups are the Ata-Manobo tribe, Dibabawon, Sama Tribe and Manguangan Tribe. The Sama tribe is generally located in the Island Garden City of Samal. There are also IP communities living in non- ancestral domain areas. These tribes are the Kalagan, Mansaka, and Mandaya.

In a manner of recognizing, respecting and protecting the rights of the indigenous people (IPs) in preserving and developing their cultures, traditions and institutions, RA 8371, known as the Indigenous People's Rights Act (IPRA) was enacted on October 27, 1997. The enactment of IPRA Law has established the IPs rights and ownership of ancestral domain claims. The law also defines the approaches in implementing development programs and projects in ancestral domain areas, particularly in the observance of the Free and Prior Informed Consent (FPIC) processes.

Ancestral domains which delineations have been conducted and approved, are issued with Certificate of Ancestral Domain Title (CADT) and the Certificate of Ancestral Land Title (CALT). Some of these ancestral domains are still undergoing delineation for the approval and issuance of CADTs. The profiles of the IP communities and ancestral domain areas are presented in Table 3-236.

Table No. 3-236 : Ancestral Domain Areas in Davao del Norte, 2013

Name of IP Tribe	City/Municipality /Barangays	CADT No.	IP Population	Area, Has.
1. Sama Tribe a. Land	IGCSamal:	R11-SAM-0415-177		
	a. Tambo (lot 1)		495	50.0342
	b. Aumbay (lot 2)		321	87.5046
	c. San Antonio (lot 3)		441	
	d. Tagpopongan (lot 3)		450	835.2381
b. water	e. Islandwide (lot 4) (lot 5)			80,135.812 2,644.27
2. Ata- Manobo	i. Talaingod:	R11-TAL-0408-071		
	a. Dagohoy		2,154	26,491.76
	b. Sto. Nino		1,885	15,118.15
	c. Palma Gil		8,061	8,671.55
	ii. Sto. Tomas:	R11-TAL-0408-071		
	a. San Jose		426	919.29
	b. Magwawa		408	244.37
	iii. Kapalong:	R11-TAL-0408-071		
	a. Gupitan		3,628	55,646.49
	b. Suaon		969	1,352.73
	c. Florida		1,061	1,158.92
	d. Mabantao		866	738.56
	e. Semong		-	610.79
	f. Mamacao	-	3,996.66	
	iv. San Isidro:	R11-TAL-0408-071		
	a. Datu Balong		407	812.31
	b. Monte Dujali		226	587.58
	c. Dacudao		226	482.27
d. Libuton		-	578.49	
3. Ata	Sto. Tomas:	R11-DAV-0213-160		
	a. Tulalian		204	59.644
	b. Balagunan		184	155.123
	c. Magwawa		408	175.878
	d. Bobongon		176	1,182.427
e. New Visayas	324	404.056		
4. Dibabawon	Asuncion:	R11-LAA-1005-035		8,559.001
	a. Buan		684	
	b. Sonlon		645	
	c. Binancian		1,465	
	d. Camansa	503		
	San Isidro:	R11-LAA-1005-035		3,353.4775
	a. Monte Dujali		226	
	b. Datu Balong		407	
c. Pinamuno	502			
Name of IP Tribe	City/Municipality /Barangays	CADT No.	IP Population	Area, Has.
5. Manguangan	New Corella:	For deliberation by the Commission en banc		13,103.2856
	a. Maming		503	
	b. Sta. Fe		658	
	c. Patrocenio		139	
	d. Limbaan		546	
	e. New Cortez		427	
f. Carcor	310			

	g. San Jose		87	
	h. New Bohol		302	
	i. Cabidanan		579	
	j. Del Monte		76	
	k. El Salvador		259	
Total Ancestral Domain Areas		= 228,196.6701 has.		

Source: NCIP- Provincial Office- Davao del Norte

There are also some tribes living in non- ancestral domain areas. These are;

1. Kalagan tribe living in Tagum City, Panabo City, Carmen and BEDujali
2. Mansaka tribe living in Tagum City, Panabo City, Carmen and BEDujali.
3. Mangguangan tribe living in Asuncion, New Corella and Tagum City.
4. Mandaya tribe living in Tagum City, Asuncion, New Corella, Kapalong, Sto. Tomas, Carmen, Panabo City and BEDujali

#### **h. Environmentally Critical Areas**

The Philippine Environmental Impact Statement Systems provides the technical definitions of environmentally critical areas (ECAs). In land use, considered among the ECAs are:

1. Areas frequently visited and or hard-hit by natural calamities which include
  - Geologic hazards, or areas classifies by MGB or as certified by other competent authorities as susceptible to landslide and areas prone to land subsidence and ground settling, with sink holes and sags.
  - Flood prone areas as identified or classifies by MGB or PAG-ASA.
  - Areas frequently visited or hard-hit by typhoon.
  - Areas prone to volcanic activities / earthquakes, transected by fault line, prone to ground shaking hazards, liquefaction hazards, earthquake-triggered landslides and tsunami hazards.
2. Areas with critical slope having 50% or more.

- *Flood Prone Areas*

Ten of the eleven cities/municipalities of Davao del Norte are prone to flooding of various susceptibilities. Only the Island Garden City of Samal is not prone to flooding as assessed with different susceptibility indexes. In the mainland, the most frequently affected by this phenomenon are those areas along the major river systems of the Tagum-Libuganon river, Lasang river, Tuganay and Saug rivers. (Table No. 3-18- **Physical Resources**) classified the susceptibility indexes as follows:

- a. Areas with very high susceptibility to flooding of 9,605.48 hectares
- b. Areas with high susceptibility to flooding of 30,227.65 hectare
- c. Areas with moderate susceptibility to flooding of 19,324.95 hectares, and
- d. Areas with low susceptibility to flooding of 21,531.45 hectares



Flooding problems need both the short term and long term control measures. Construction of protection dikes, cut-off channels, cross drainage along highways and de-siltation of rivers are among the immediate solutions. Since denudation of the vegetative cover has been identified as the major contributory factor to flooding, reforestation and watershed rehabilitation programs should be undertaken as long term activities.

- *Soil slopes and erosion*

Soil erosion and landslides are caused by different factors which include vegetative cover, topography, drainage, amount and frequency of rainfall and inappropriate human practices. Erosion and rain-induced landslides are often aggravated by slope situations. The steeper the slope- coupled with inappropriate human activities, the higher the degree of erosion and landslide occurrences. Areas susceptible to severe erosion need to be protected from further deterioration. These areas are observable mostly in the mountainous part of Kapalong, Talaingod and Sto. Tomas and in the Island Garden City of Samal. Areas susceptible to severe erosion is approximately 147,477.50 hectares while varying susceptibilities of rain induced landslides affect 262,402 hectares of the province.

- *Geologic Fault Lines*

Two major active fault lines traverse Davao del Norte. The first extends from the municipalities of Mati, Davao Oriental to New Corella, Davao del Norte. The second major fault line is located between the City of Tagum, Davao del Norte and Laak, Compostela Valley.

Fault line is one natural hazard where lateral or vertical displacement (movement) is likely to occur. Episodic movements along this “active” fault lines cause earthquakes with accompanying destruction of property and may be loss of life.

The geohazard mapping conducted by the Mines and Geosciences Bureau-XI revealed that several barangays in Davao del Norte are susceptible to mass movements. The areas that are prone to hazard includes 7 barangays in Asuncion, 12 barangays in New Corella, 7 barangays in Sto. Tomas, 3 barangays in Talaingod, 4 barangays in San Isidro and 5 barangays in the Island Garden City of Samal.

Earthquakes and/or ground shaking is produced during seismic earth movements as results of the presence of fault lines. Earth quakes may induce ground shaking and landslides . All of the eleven municipalities and cities are, to some extent, prone to ground shaking. Table\_\_ of Physical Resources identifies 183,466 hectares as prone to ground shaking. Around 100,605 hectares are also prone to earthquake-induced landslides.

Since earthquakes are natural phenomena, the people of Davao del Norte, especially those living in high risk areas need to be always prepared in case of its occurrence. There

is a need to strengthen disaster and risk management programs and activities by strengthening IEC initiatives and formulation of disaster risk management plan.

Local building officials must ensure that all existing building and those to be constructed should strictly conform to building standards particularly in high risk areas.

**c. Residential/Settlement Areas**

Urban residential areas are concentrated in the poblacion or town/city center, while rural residential areas are concentrated within the barangay site. In 2007 about 3,508.60 hectares are considered residential and settlement areas. Large concentrations of residential areas and built-up areas are mainly in the urban centers of Tagum City and Panabo City, Island Garden City of Samal and Sto. Tomas.

**d. Built-up, Infrastructure and Utilities Areas.**

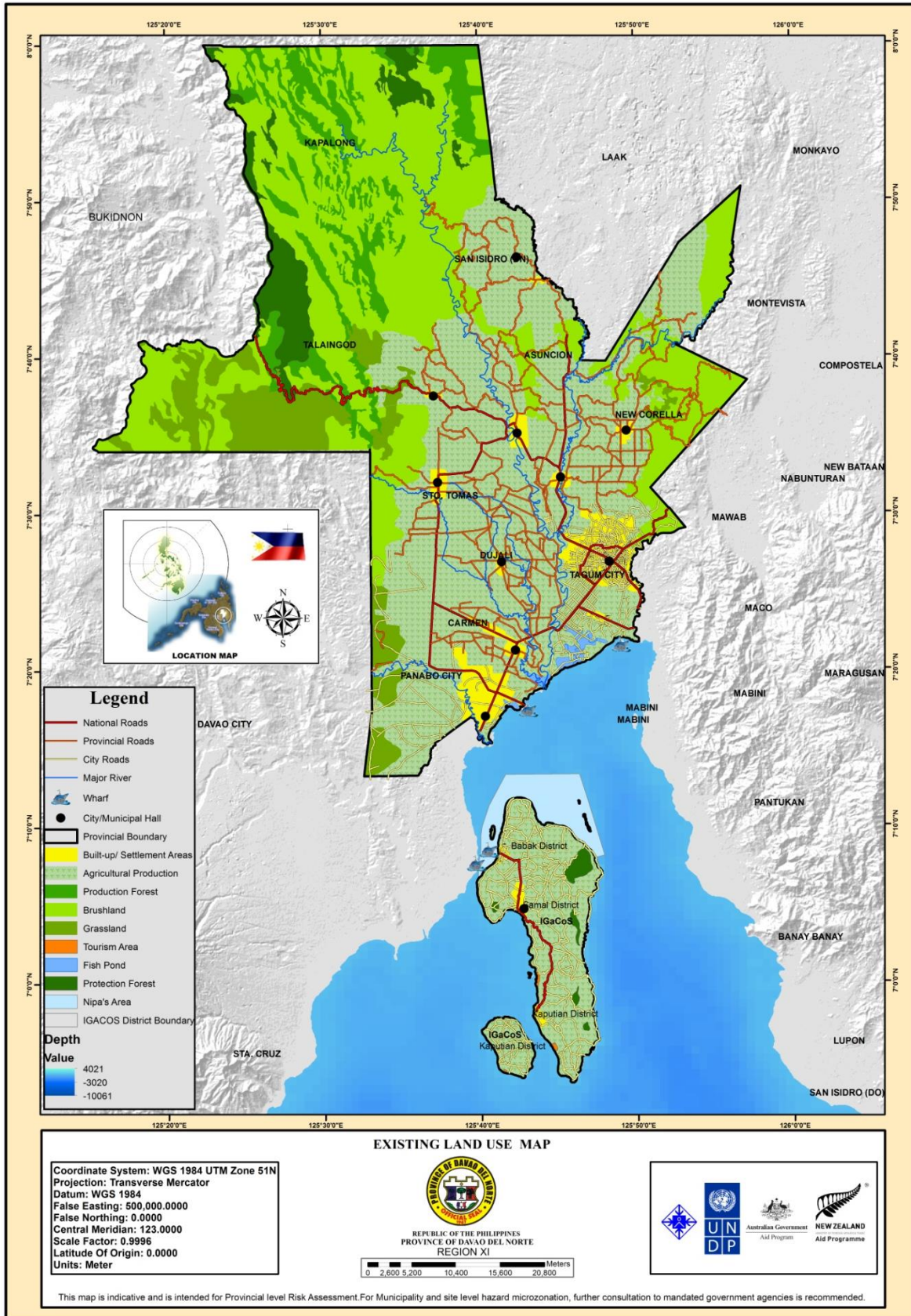
The total area used for built-up, infrastructure and utilities, in Davao del Norte is estimated at 8,624.50 hectares. Infrastructure and utilities, particularly of roads, bridges and drainage systems occupy 4,978 hectares. For areas that roads occupy, the provincial roads cover the largest at 1,382.28 hectares or 27.7 percent of the area for infrastructures, while municipal roads have the least area at 204.54 hectares or 4.1 percent. Tagum City has the largest area devoted for infrastructure and utilities at 812.96 hectares, while the Municipality of B.E Dujali has the least at 100.76 hectares.

Table No. 3-237 : Existing General Land Use by City/Municipality  
Province of Davao del Norte, 2007 ( in hectares)

City/ Municipality	Production Land Use								Protection Land Use		Built-up, Infra and Utilities	Residential	Total	
	Agriculture	Fishpond	Production Forest					Industrial Areas	Touris m Areas	NIPAS				Primary Forest
			Residual Forest	Brushland	Grassland	Tree Plantation	Cultivated Areas							
Asuncion	22,509.03	25.10	213.00	337.17	734.71	3,436.00	443.95	0	0	0	937.04	508.00	203.00	29,347
B.E Dujali	8,575.00	175.00	0	0	0	0	0	0	0	0	0	250.00	100.00	9,100
Carmen	15,420.99	284.35	0	0	0	38.32	0	0	0	0	17.84	616.80	246.70	16,625
Kapalong	28,016.72	5.00	1,211.90	2,020.00	4,342.50	25,199.00	2,524.64	0	16.00	0	30,385.74	617.00	247.00	94,586
New Corella	25,555.80	3.86	287.64	479.50	1,030.80	3,047.00	599.31	0	23.25	0	472.64	463.00	185.20	32,148
San Isidro	4,491.23	5.41	1,057.00	1,762.70	3,787.64	222.30	2,202.13	0	59.70	0	1,167.39	329.00	164.50	15,249
Sto. Tomas	27,763.15	32.33	233.00	360.30	792.80	191.00	484.94	2.00	11.12	0	808.86	972.50	389.00	32,041
Talaingod	3,178.83	10.70	628.68	1,047.80	2,252.70	10,583.87	1,309.75	0	0	0	26,091.57	261.40	130.70	45,496
IGC of Samal	23,859.63	30.00	0	0	1520.05	0	0	0	560.39	(7,656.00)	837.43	902.50	361.00	28,071
Panabo City	22,388.61	212.00	0	0	514.30	0	0	58.66	0	0	28.18	1,543.75	617.00	25,363
Tagum City	13,752.56	1,237.81	0	0	0	0	47.96	164.84	0	0	26.83	2,160.00	864.00	18,254
Davao del Norte	195,511.55	2,021.56	3,631.22	6,007.47	14,975.50	42,717.49	7,612.68	225.50	670.56	(7,656.00)	60,773.52	8,624.45	3,508.60	346,280
% Distribution	56.46	0.58	1.05	1.73	4.32	1.20	2.20	0.07	0.19	(2.21)	17.55	2.49	1.01	100

Source: PPDO- as computed

Map 48: EXISTING LAND USE MAP , Davao del Norte



### 7.1.2 Trends

#### a. Built-up, infrastructure and utilities areas

Settlements, built-up, infrastructure and utilities areas of the Province increased from 8,186.75 hectares in 2000 to 12,133.05 hectares in 2007. This is because of the increasing population coupled with increased economic activities not only in major centers of Tagum City and Panabo City but also in urban centers of Kapalong, Sto. Tomas and the Island Garden City of Samal. Economic activities in these areas have dramatically increased in the past seven years, especially Tagum City. Davao del Norte's population is growing at an average rate of 1.81 % annually. Tagum City has the most number of populations followed by Panabo City and Sto. Tomas. Population in year 2007 has increased by 13.93 percent when compared to the population in year 2000.

There is an increase of economic activities in major growth centers like Tagum City and Panabo City, couple with the massive expansion of banana plantations in Sto. Tomas, Kapalong, New Corella, Carmen, B.E Dujali and Asuncion. Some industries in the province are also being established on these growth areas. Such increases triggered population increases (in-migration) due to employment opportunities, hence the demand for basic services are also increasing. All of the municipalities and cities have recorded an increase in population based on the 2007 census.

#### b. Agriculture Production

Crop shifting has resulted to a substantial decrease of areas devoted to rice production but increased the area for Cavendish banana plantation. Crop shifting is allowed but need to be judiciously applied, especially at the outlook of province achieving staple food sufficiency. Rice areas were reduced to 18,566.11 hectares in 2007, from 29,390 hectares in 2000; while areas for banana (Cavendish) plantation increased to 31,484.53 hectares in 2007 from 21,346.70 hectares in 2000.

Agricultural areas are usually affected or reduced with the need to accommodate other land requirements for non-agriculture uses. However, there are areas of the production forests that could be developed for agriculture uses. These are some of the grasslands and brushland that maybe developed into agro-forestry and the production of other staple (food), commercial and industrial crops.

#### c. Forestland

Forestland areas are of two categories, the production and protection forests. Production forests are generally those areas where trees are harvested for commercial uses like lumber and fuel. To ensure availability of lumber and wood, production forests are planted/replanted with forest tree species. Other economic activities maybe allowed in some areas within the production forests, like cultivation and growing of agricultural commodities.



Protection forest includes primary or old growth forest. Most common tree species are those exotic ones that need to be preserved. Tree harvesting and cutting is generally not allowed or restricted within the protection forests.

Both forestland areas were devastated with the indiscriminate cutting of trees and unsustainable tree harvesting and farming practices. Some communities encroached into forest areas restricted for occupations, and are posing threat of continued destruction of the habitat. There are on-going efforts of the government and the private sector to rehabilitate the forests to restore back the desired forests cover in the province. The proposed utilization of denuded forest presently dominated by grass and shrubs into agro-forestry and forest plantations will hopefully bring back the desired state of the forestland in Davao del Norte. Strict implementation of forestry laws and regulations and rationalization of existing land use in the uplands are just some of the initiatives that should be given priority.

#### **d. Tourism**

There was an increase in areas set aside for tourism activities with the effort of developing potential areas in the mainland in the concept of eco-tourism. Areas devoted for tourism development increased from 92.87 hectares in 2000 to 670.46 hectares in 2007. The proposed development of 1,002.64 hectares as tourism area in the Island Garden City of Samal will boost its position as one of the major tourist destinations in the region and in the country as well.

*Table No. 3-238: General Land Use Trend (in hectares)  
Province of Davao del Norte, 2000- 2007*

<b>Land Use</b>	<b>2000</b>	<b>% Total</b>	<b>2007</b>	<b>% Total</b>
1. Agriculture	131,827.58	36.20	195,511.55	56.46
2. Fishpond	2,756.50	0.80	2,021.56	0.58
3. Production forest				
- Residual	47,523.10	13.00	3,631.22	1.05
- Brush land	64,818.83	17.80	6,007.47	1.73
- Grass land	108,941.37	30.00	14,975.50	4.32
- Tree plantation			42,717.49	12.34
- Cultivated areas			7,612.68	2.20
4. Industrial areas			225.50	0.07
5. Tourism areas	92.87	0.03	670.46	0.19
6. NIPAs	(7,656.00)		(7,656.00)	(2.21)
7. Primary forest			60,773.52	17.55
8. Built-up, infra and other utilities	8,186.75	2.25	8,624.45	2.49
9. Residential			3,508.60	1.01
<b>TOTAL</b>	<b>364,147</b>	<b>100.00</b>	<b>346,280.00</b>	<b>100.00</b>

*Source: PPDO*

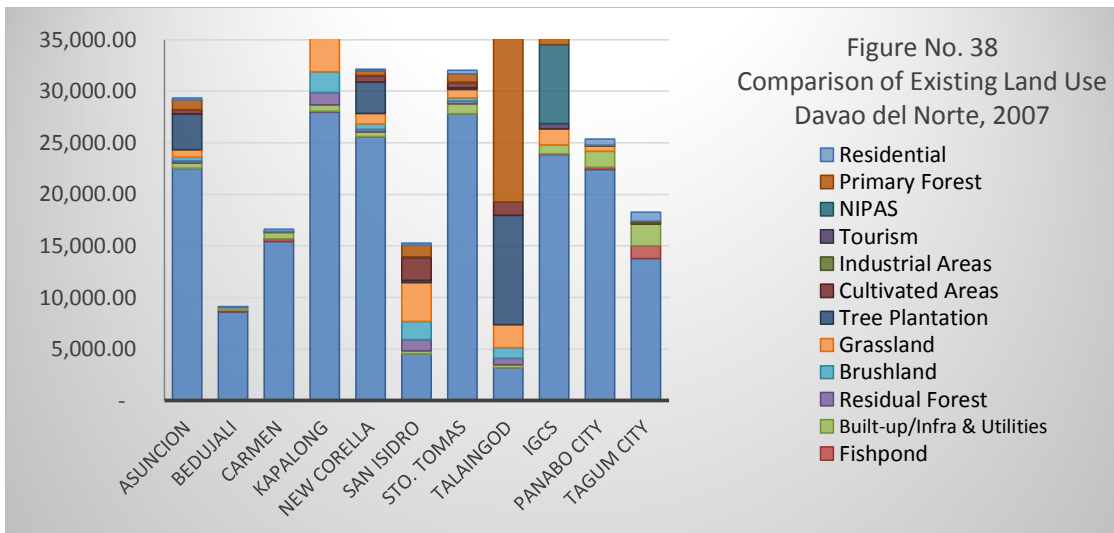
Based on the data presented in Table No. 3-170, the Municipality of Kapalong has the biggest agricultural area among the cities and municipalities in the province. It has also



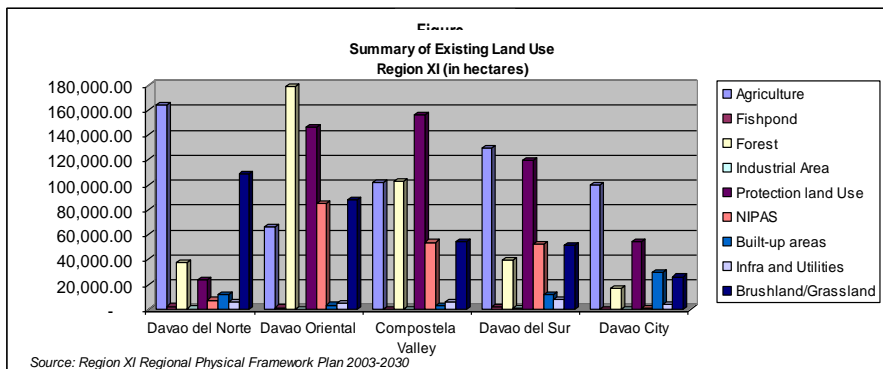
the largest production and protection forests as delineated by DENR. Its production and protection forests account to 48.40% of the forestland areas of the province.

The Island Garden City of Samal (IGCS) is endowed with natural tourist attractions such as white and pristine beaches which are ideal for recreation and water sport activities such as diving, snorkeling and the likes. Waterfalls, caves and other natural attractions are found in the Island which boost as the tourism destination of the province. Around 560.39 hectares of tourist areas are developed in IGCS.

Tagum City being the capital and the major growth center in the province has the largest area for built-up and settlement at 3,024 hectares. In terms of fishpond development, Tagum City has a sizeable area of 1,237.81 hectares.



In the regional context, Davao del Norte has the biggest area used for agriculture at 163,932.94 hectares. While it ranks third after Davao City and Davao del Sur, in terms of Built-up area and ranks fourth in terms of areas used for forest production. Figure 3-25 shows the comparison of existing land use among the provinces and Davao City in Region XI.



### 7.1.3 Land Use Opportunity/Potentials

Land use opportunity refers to lands that are composite with lands actively utilized for various activities and have properties favorable for economic development and investments. The socio-economic and physical limitations inherent in these lands can be manipulated and corrected through proper and sustainable management with favorable policies and incentives.

Land use opportunity is classified into six (6) sub-categories, namely: agricultural areas, expansion areas, areas needing rehabilitation, areas for preservation, wetland areas and miscellaneous areas. Map 30 shows the land use opportunity of the province.

The land use opportunity in Table 3-171 indicates that 126,390.78 hectares or 36.5 percent of the total provincial land area are best suited for agricultural activities.

Expansion areas or lands with potential for the expansion of both agriculture and urban areas cover about 95,859.98 hectares or 27.7 percent of the total land area of the province. These consist of grasslands or shrublands with potential for built-up areas or agro-forestry development.

A total of 66,149.78 hectares or 19.1 percent of the total area of the province is considered rehabilitation areas. These include denuded areas within forestlands and critical watersheds; and those areas in the uplands that are used for crop cultivation that employs unsustainable farming practices.

Preservation areas are those which are to be permanently retained with forest cover. These are NIPAS areas and watersheds which should be protected from any intrusion or other economic activities. The province's preservation area covers about 54,477 hectares or 15.7 percent of its total area.

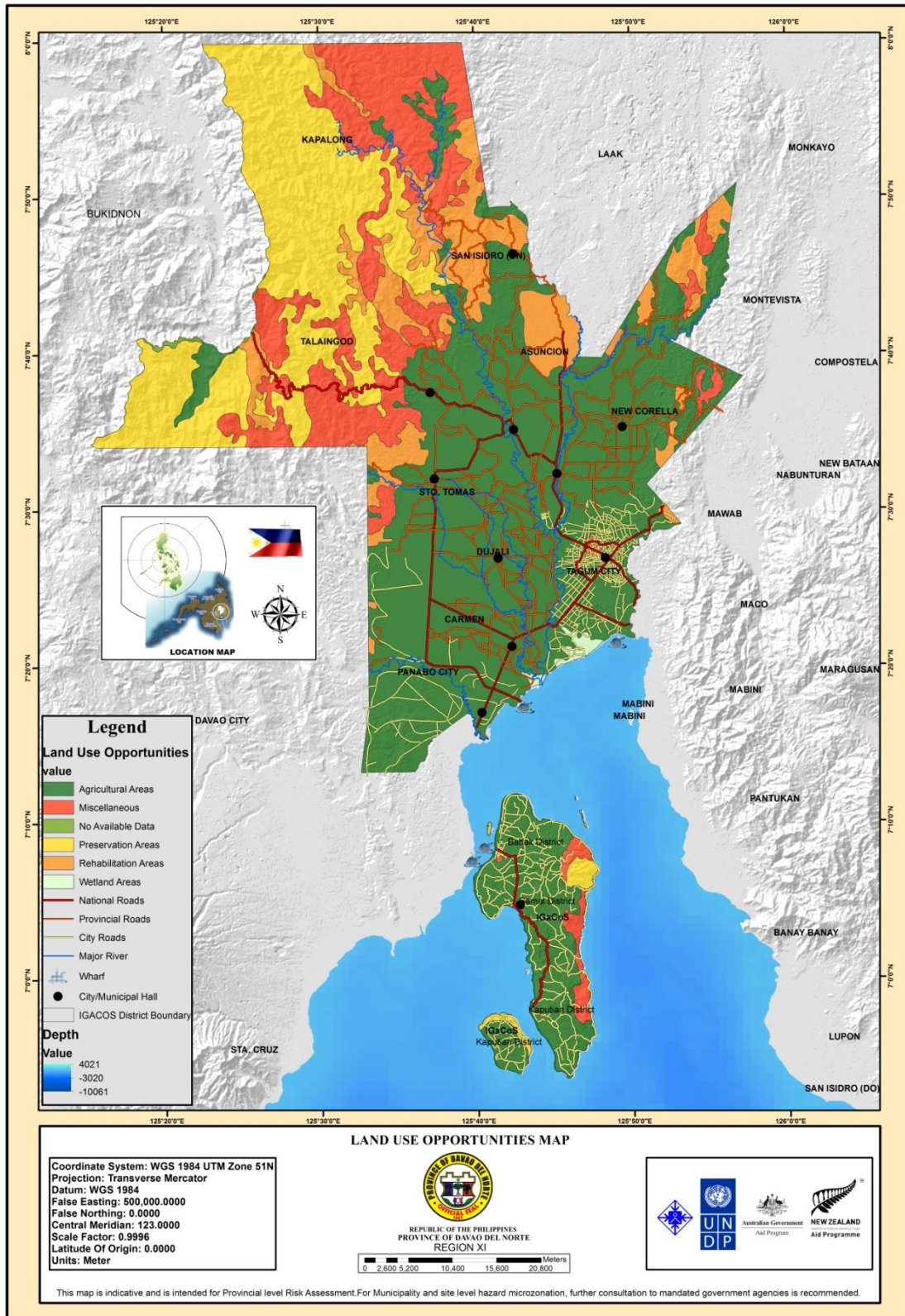
The remaining 3,237.18 hectares or 1.0 percent of the province's total land area are best suited for aquaculture and for miscellaneous activities.

*Table No. 3-239 : Distribution of Land Area by Land Use Opportunity  
Classification, Davao del Norte, 2007*

<b>Land Use Opportunity Classification</b>	<b>Area (in hectares)</b>	<b>% Distribution</b>
Agricultural	126,390.78	36.5
Expansion	95,859.98	27.7
Rehabilitation	66,149.78	19.1
Preservation	54,642.28	15.7
Wetlands	1,332.50	0.4
Miscellaneous	1,904.68	0.6
Davao del Norte	346,280.00	100

*Source: BSWM-XI/RPFP*

Map 49: LAND USE OPPORTUNITIES MAP , Davao del Norte



## 7.2 Physical Framework

### 7.2.1 Demand

#### a. Residential, Settlements, Built-up Areas

Population of the province will increase from 945,764 in 2010 (census years) to 1,265,916 in 2022 or by 2.46% annually. Tagum City will be the most populated at 1,872 persons per square kilometer. Kapalong and Talaingod will be less dense by 2022 at 90 persons per square kilometer of their respective land areas. The province will have an average population density of 366 persons per square kilometer by 2022.

The increasing population and the growing economic activities in the province will trigger the additional requirement for built-up areas including the need for residential and settlement spaces. Requirement of areas for built-up, infrastructures and other utilities will increase from 8,624.45 hectares to 12,899.95 hectares. Considering the standard of 150 populations per hectare (low dense) and 250 populations per hectare (medium dense) residential spatial requirements, residential and settlement areas will require an increase from 3,508.60 hectares in 2007 to 5,248.40 hectares by 2022.

The growth in population will also dictate the need to expand industrial areas. Also, the anticipated boom in industries that the ASEAN integration will spouse, dictates need to set aside 2,142 hectares for the development of the industry sector. All municipalities and cities must anticipate the demand for industries development to be at pace with globalization trends.

#### **Agricultural/Production Land**

With an impending demand of additional land to accommodate the expanding populations' requirements for settlements and residences, built-up areas, infrastructures and other utilities, land presently devoted to agriculture within production lands will be proportionately reduced. However, there should be judicious conversion of agricultural areas into non- agriculture uses. Trade-off must also consider the context of food security and economic competitiveness of the province in the agriculture sector. The total area devoted for agricultural/production land will be reduced by about 2.42 percent of the existing area by the end of the plan period to accommodate other spatial needs.

To compensate for the loss of agriculture areas in the alienable and disposal lands, government and the private sector may develop suitable forestland areas into agriculture and agro-forestry uses. Cultivated areas within production forests may be increased by 34% provided sustainable upland farming practices will be observed.

In terms of specific crop production there may also a decline in areas used for rice production due to crop shifting from rice to Cavendish banana.

**b. Forestland**

Areas devoted to production forest will remain at 744,944.70 hectares as delineated by DENR, within the planning period. Existing brushland/grassland however, will be reduced from 20,983 hectares to 17,161 by having these lands cultivated with agricultural commodities (as these lands can be planted with perennial and annual crops). Tree plantation development may be maintained or expanded by developing part of the grassland and brushland areas in the forestlands.

**c. Tourism**

Tourism can provide employment and additional revenues and incomes to the local government units. Tourism sites include the many beautiful beaches and diving sites in the Island Garden City of Samal; tropical rainforests and other natural attractions like caves, waterfalls and springs found in the Island and in many areas in the mainland. These are just some of the tourism potentials of the province, which include the vast tracks of banana plantations. Ethnic and community-based tourism is also one of the comparative advantages of the province as it is home to diverse and indigenous cultural communities. Land use intended for tourism is projected at 1,112.71 hectares.

**d. Protection land use**

Davao del Norte's protection lands should be cautiously preserved and protected from destructive human activities. Protected areas include the Mangrove Swamp Forest Reserve and the Samal Island Protected Seascape/Landscape (NIPAs) with an area of 7,656.00 hectares in the Island Garden City of Samal, the Non-NIPAS, highly restricted agricultural areas (NPAAD/SAFDZs) and the severely eroded areas. Non-NIPAS are lands classified as forestlands but mostly have no forest cover at all and needing rehabilitation and proper management. Severely eroded areas are part of the production land that needs to be protected from further deterioration. These areas are observable mostly in the mountainous part of Kapalong, Talaingod and Sto. Tomas and along the steep slopes of the eastern part of IGaCos.

Included in the Non-NIPAS category of protection lands are the 60,773.52 hectares of forestlands (of old growth forest) which has an elevation of more than 1,000 meters above sea level (masl) and with a slope of 50 percent and above. These areas are generally found in the municipalities of Kapalong and Talaingod.

For long term food security, agricultural areas classified as highly restricted for conversions should be observed as among the areas that need to be protected from irreversible conversion.



## 7.2.2 Integration of demand with supply

### a. Population and settlements

Between 2000-2007, Davao del Norte's population was growing at an average growth rate of 1.81% annually. This growth rate is higher than the regional growth rate of 1.71% in the same period. In Region XI, the province ranks second after Davao City which has an average growth rate of 2.41%. Between 2000- 2010, the population growth rate of Davao del Norte was at 2.43% and population is projected to reach 1,265,916 by 2022.

Major growth centers will have substantial contribution in the increase of population at the end of the planning period. By 2022, Tagum City will have a projected population of 341,631; Panabo City of 237,043; Sto. Tomas at 147,875 and Island Garden City of Samal with 117,548 persons.

The increasing population coupled with the increasing economic activity in major growth and emerging growth centers requires an additional area for basic social services and infrastructure facilities. Major growth centers like Tagum City and Panabo City and emerging centers like the Island Garden City of Samal, Sto. Tomas and Kapalong need to have substantial area allocated for urban expansions, as indicated in their respective comprehensive development plans.

In view of these projected condition in Davao del Norte for the next 15 years, the land use plan has to address population pressure challenges particularly in the urban centers. Thus, provision of proper infrastructure facilities in the rural areas has to be laid down in advance to minimize pressure of the urban areas.

The increase in population will also require additional area for settlement and residential purposes. Other types of demand will likewise affect and require allocation for the commercial and institutional areas to absorb the expected growth of the business sector associated to the increasing market for products and services.

The proposed areas intended to accommodate the demand or future needs are within the allowable limit established by law. However, the need to expand the areas should consider those areas identified as restricted under NPAAD/SAFDZ. The proposed requirement of areas for built-ups, residential and other infrastructure and utilities in 2022 will be 18,148.35 hectares.

Population may encroach into forestland areas. This is common in rural areas wherein settlements are concentrated in areas that are classified as forestland. Approximately 50,754 populations are living in areas within forestland. These people are engaging in activities of cultivating forest areas for agriculture production. Oftentimes cultivation is in unsustainable manner thus giving more pressure upon the land. Although these settlements may not be within the identified areas for protection, but the practice of unsustainable farming methods may further contribute to soil degradation and erosion

problems. Sustainable use and proper management of upland resources has to be strengthened by properly educating the communities on the importance of protecting the natural resources.

### **7.2.3 Integration with other land use requirements**

#### **a. Infrastructure/Utilities Areas**

Areas devoted to infrastructure development will increase by about 12.9 percent from the existing level of 4,978.76 hectares to 5,623.16 hectares. A national road density standard of 1.0 kilometer road length per square kilometer of alienable and disposable area will require to additional road infrastructure in some municipalities. Kapalong needs an additional road length of 941.850 kilometers, 454.960 kilometers for Talaingod, and 91.00 kilometers is needed for B.E Dujali. Better accessibility within these areas increases the chance of attracting developers and investors for industries development and providing better services to the populace.

The opening of Kapalong-Talaingod-Bukidnon Road occupy 250 hectares within the production forest. This particular road section will provide better access and linkage between Davao del Norte and the Province of Bukidnon. Asuncion-Laak provincial road with an area of 126 has. is already approved at third reading at Congress for conversion from provincial to national road. The improvement of this road section will increase the economic activities of the neighboring provinces of Compostela Valley and Agusan del Sur with Davao del Norte as the gateway.

#### **b. Production land use**

Davao del Norte is primarily an agriculture province. About 187,137.21 hectares will be devoted for agricultural production. Majority of its population are engaged in agriculture and agriculture-based enterprises. Production of crops may utilize brushland and grasslands in production forest, provide appropriate farming practices are observed to reduce the risk of soil loss and erosion.

Banana industry, manufacturing and other agri-based industries contribute significant employment opportunities in propelling economic growth of the province. Trading, commerce and social services are found mostly in urban centers or poblacion, though satellite centers related to the provision of basic services are also located in the rural areas.

This existing condition requires the development of agriculture sector within the province to propel and sustain agro-industrialization. The development of the infrastructure and utilities, maintenance of peace and order, and good political leadership is indeed a competitive advantage of Davao del Norte to become a strategic location for investment in Region XI and Mindanao.

In terms of land use requirement, other support facilities to agriculture need to be considered in land allocations. One of which is on irrigation systems development. Irrigation system is a basic infrastructure support to rice and Cavendish banana productions; two industries that propel the economic growth of the province. There are four major categories of irrigation systems operating in the Province. These irrigation systems cover an effective service area of 20,410.08 hectares of agricultural land. These systems provide the irrigation requirement of 13,872.12 hectares rice and 6, 537.96 hectares of banana farms.

Inland fish production is to be allocated as well with production areas. Inland fishpond aquaculture has been practiced as an economic enterprise. Most common species reared are fresh water fishes like tilapia and mudfish. Milk fish (bangus) production had shifted from inland fishpond to marine cages production as the latter is more profitable to engage with. The 2,021.56 hectares utilized for freshwater fishpond production will then be maintained. However, for enterprising farmers with farms in water-logged areas, utilizing the same for fish production is a recommendation to have these areas become productive.

As to production forest land use, the 74,944.70 hectares of forest will be maintained. With the demand for development of industries (e.g., agriculture, wood, etc), some areas in the production forest maybe utilized for economic activities, provided appropriate conservation and sustainability measures will be instituted. Portion of the brushland and grass lands will be cultivated with agricultural commodities and tree plantations will be expanded. Production of forest species for commercial purposes will be pursued to address the need of the ever- demanding wood industry. Need of land for industry development will also be considered in the allocation of alienable and disposable lands. Thus and expansion from 225.50 hectares in 2007 to 2,142 hectares in 2020 will be considered to address the need to expand the industries.

### **c. Social and utility/infrastructure services**

The developments of these sectors are inseparable to a well-meaning growth. These are basic human needs for decent and comfortable existence. Thus, allocating spatial requirements is a must. The needs of these sectors is part of the built-up, infrastructure and other utilities land requirements which are increased from 8,624.45 hectares to 12,899.95 hectares. All of the LGUs must allocate the land requirements, especially the major growth centers like Tagum City, Panabo, IGCS and Sto. Tomas, which are the most populated ones.

#### ➤ *Health, Education and Protective Services*

In 2014, there are 25 hospitals in Davao del Norte, 4 of which are government operated and the rest are privately-owned. There are three district hospitals operated by the provincial government located in Kapalong, Carmen and the Island Garden City of Samal, while the DOH-operated tertiary hospital (Davao Regional Hospital) is situated in Tagum City. Most of the private hospitals are located in Tagum City and Panabo City. Health

care services in other areas with no hospitals are augmented by 14 Health centers and 189 Barangay Health Stations.

Elementary schools in the province have a total of 386, of which 296 are public schools and 90 are private schools. For the secondary level, there are 71 public schools and 36 private institutions, while at the tertiary level, 21 schools are located in the province. These schools are categorized as university, colleges, technical and vocational schools.

The number of housing units in the province in year 2010 has reached 207,179 units, giving an increase of 40 percent from the number of dwelling units in 2007 (NSO, 2010). The growth indicates the increasing affordability and capacity of the people to acquire decent shelter. Access to low cost housing is intensified in the province thru the initiatives of the government. Relocation and resettlements are also provided to squatters or informal settlers.

There are fifteen (15) police stations in the province located in every city and municipality with Tagum City having the most number of stations having 4; and Island Garden City of Samal with 3. The rest of the LGUs maintain 1 police station. On the other hand, only nine (9) LGU's have fire stations. B.E Dujali and San Isidro have no fire stations, however, they are strategically located and adjacent to LGUs with available fire stations.

#### ➤ *Social Welfare*

As of 2014, there are 489 Day Care Centers which cater to the developmental needs of the pre-schoolers in Davao del Norte. Tagum City has the most number of day care centers with 84, while B.E. Dujali has the least with 18. There are also six elderly day centers established in six localities. The municipalities of New Corella, Talaingod, Sto. Tomas and San Isidro have yet to establish an elderly day center in their areas, These LGUs however, have their own senior citizen's office to cater to the needs of the elderly. Also, there are 11 senior citizens association in every LGU with Panabo City having the most numbered of senior citizen members in its association or 29% of the total membership.

#### ➤ *Utility/Infrastructure Services*

Based on the actual household survey conducted by the PHO field workers last 2014, ninety percent of the total households in the province have access to potable water. While the percentage is quite high, 11 % of this comes from doubtful sources. Level II and Level III water sources supply 48 % of the household populations. There are six (6) water districts operating in Davao del Norte, with Tagum Water District serving the most number of households at 80 % of the total households served. Almost all households of Tagum City (99 %) have access to potable water.

At present, sources of water (deepwell) in urban areas are becoming scarce and depleting. There is a need for an integrated water system development tapping available

sources such as surface water, to accommodate the growing demands for this utility in the future.

Energization rate of the barangay in the province is placed at 100%. In terms of household connections, only 78.32% were achieved as of 2014. Talaingod has the least number of household served at 12 percent.

Major flood control projects were constructed by the Department of Public Works and Highways. These are: (a) Libuganon Flood Control, (b) Carmen Flood Control, (c) Tuganay Flood Control, (d) Lasang Flood Control and (e) Tagum Drainage.

Improvement of drainage facilities, re-channeling and desilting of rivers and creeks, and small watershed rehabilitation and management are some of the measures undertaken to minimize the occurrence of floods and other environmental hazards. The effort is aimed to address the flooding problem of 80,689.54 hectares (23% of the province' area) which are considered as flood prone.

Table No. 3-240: Proposed General Land Use by City, Municipality (in hectares)  
Province of Davao del Norte, 2022

City/ Municipality	Production Land Use								Protection Land Use		Residential	Built-up, Infra and Utilities	Total	
	Agriculture	Fishpond	Production Forest					Industrial Areas	Tourism Areas	NIPAs				Primary Forest
			Residual Forest	Brushland	Grassland	Tree Plantation	Cultivated Areas							
Asuncion	22,189.33	25.10	213.00	303.45	532.83	3,490.00	625.55	50.00	-	-	937.04	280.20	700.50	29,347.00
BEDujali	8,247.60	175.00	-	-	-	-	-	39.00	-	-	-	182.40	456.00	9,100.00
Carmen	14,938.59	284.35	-	-	-	38.22	-	62.00	-	-	17.84	364.00	920.00	16,625.00
Kapalong	27,518.02	5.00	1,211.90	1,920.00	3,303.64	25,955.00	2,907.50	176.00	16.00	-	30,385.74	339.20	848.00	94,586.00
New Corella	23,983.80	3.86	287.64	430.00	837.61	3,138.00	751.00	40.00	23.25	-	472.64	244.00	610.20	30,822.00
San Isidro	4,386.23	5.41	1,057.00	1,675.00	3,248.77	230.00	2,821.00	21.00	59.70	-	1,167.39	192.50	385.00	15,249.00
Sto. Tomas	26,731.01	32.33	203.00	343.00	719.43	200.00	597.00	325.00	11.12	-	808.86	591.50	1,478.75	32,041.00
Talaingod	2,739.93	10.70	628.68	995.00	1,757.62	10,900.00	1,541.50	22.00	-	-	26,091.57	269.70	539.30	45,496.00
IGCS	22,948.18	30.00	-	-	920.05	-	600.00	87.00	1,002.64	(7,656.00)	837.43	470.20	1,175.50	28,071.00
Panabo City	20,769.92	212.00	-	-	174.30	-	340.00	520.00	-	-	28.18	948.20	2,370.40	25,363.00
Tagum City	11,358.60	1,237.81	-	-	-	-	47.96	800.00	-	-	26.83	1,366.50	4,742.30	19,580.00
Davao del Norte	185,811.21	2,021.56	3,601.22	5,666.45	11,494.25	43,951.22	10,231.51	2,142.00	1,112.71	(7,656.00)	60,773.52	5,248.40	14,225.95	346,280.00
% Distribution	<b>54.04</b>	<b>0.58</b>	<b>1.04</b>	<b>1.64</b>	<b>3.32</b>	<b>12.69</b>	<b>2.95</b>	<b>0.62</b>	<b>0.32</b>	<b>(2.21)</b>	<b>17.55</b>	<b>1.52</b>	<b>3.73</b>	<b>100.00</b>



## 8.0 Overall Physical Framework

The spatial development of the province is affected by various factors such as resource endowments, existing infrastructure facilities, existing distribution of population and economic wealth, and other physical and socio-cultural factors as well as policy interventions. Three most dominant factors that are more directly subject to planned development are:

- a. Distribution of settlements
- b. Transportation network
- c. Land use and potential

A spatial framework for Davao del Norte is prescribed with respect to these factors.

The increasing demand for land and its natural resources necessitates proper spatial classification that will accommodate physical development and promote sustainable land and environment management. Appropriate choices in the efficient land use trade-offs should develop sustainable use and management of land resources linking growing demand for food, social and economic habitation and development; and environmental protection and enhancement.

The land use plan aims to promote the appropriate and efficient ways of using the land and its natural resources in a manner that it will be sustained in the future. It aims to direct the socio-economic development in terms of rational allocation and delineation of various land uses. It is imperative for the LGU to come up with a development framework to ensure the sustainable growth in its economy through the judicious and rational use of its resources in order to serve the growing needs of its constituents.

Davao del Norte will continue to adopt the cluster development approach or the nodal or the growth center concept of development utilizing the integrated area development approach. This concept achieves a certain hierarchy of functions in the sense that the central point of activity is lodged in major center or area. Tagum City, Panabo City, and Sto. Tomas are the major growth centers while the Island Garden City of Samal, Kapalong and Carmen are considered emerging growth centers. The other municipalities which will serve as the nodes will support the major growth centers as its captive market while at the same time providing neighborhood support facilities and services to its area of influence.

The big brother-small brother concept shall be followed under the cluster development approach-that the success of the more affluent cities or municipalities be rubbed on or shared with the less privileged one. There are four clusters identified in the province, where in each cluster, there is a big brother, which is to take the lead for the others. These four clusters are the following:

- Cluster 1: Tagum City, Asuncion, San Isidro and New Corella
- Cluster 2: Sto. Tomas, Kapalong and Talaingod

Cluster 3: Panabo City, Carmen and B.E Dujali

Cluster 4: Island Garden City of Samal

For the first cluster, Tagum City will be the big brother. Since Asuncion, New Corella and San Isidro are mainly agricultural zones these municipalities can help provide the food requirements of Tagum being the natural food basket. Productivity level in these areas should be maximized by enhancing the existing infrastructure facilities and providing new ones like irrigation, water system, pre and post harvest facilities and appropriate technologies that would enhance production without necessarily increasing the land area. Tagum can be the basin where the produce from New Corella, Asuncion and San Isidro are brought. Tagum City therefore, will have the additional function as the outlet, the marketing arm and distributor of agricultural products from New Corella, San Isidro, Asuncion and even other municipalities.

Flooding and senseless wastage of resources in this cluster shall be controlled by instituting appropriate mitigating measures like reforestation activities, rehabilitation of existing drainage system and construction of new ones, in the upland and lowland areas.

To meet the demand of increased business activity, infrastructure support facilities in the form of improved drainage, sewerage, water, power, irrigation and telecommunication facilities must compliment the road network enhancement.

In this kind of development approach, Tagum City will become the prime business and service center, Panabo City as the industrial center, Sto. Tomas as agro-industrial zone and the Island Garden City of Samal as the agri-tourism area. Other municipalities in the province should play a vital role by providing raw materials and workforce, among others.

For the second cluster Sto. Tomas is the big brother who shall jumpstart the other two (Kapalong and Talaingod) to progress. For this cluster, roads and access within and connecting to these municipalities shall be improved. The two municipalities with the least number of road densities are in this cluster. The lack of road network has hindered the development in some areas of these municipalities. Talaingod, which is considered as the last frontier of the Lumads, has lagged behind its neighbors and remains to be a depressed area. Talaingod along with Kapalong and Sto. Tomas could be developed as agro-tourism area and agro-industrial zone. This cluster will be made as the gateway of Davao del Norte to Region X more particularly the province of Bukidnon. With the completion of Tagum-Kapalong-Talaingod-Bukidnon road, accessibility between these areas will be greatly improved. Opening of this road will result to better economic opportunities and trade-offs between the two provinces. Opening more road network within the vicinity would hopefully have a domino effect on the neighboring municipalities of Kapalong and Sto. Tomas.

Since the major watershed of the province is within this cluster, reforestation activities shall be intensified in this area. Approximately, 85 percent of the forestland in the

province is found in this cluster. Environmental protection and rehabilitation shall go along side with the enhancement of economic and human resources in the province.

For the Panabo City-Carmen-B.E. Dujali cluster, Panabo City shall hold the distinction and the responsibility of being the big brother to the other two municipalities. Because of its proximity to Davao City and its accessibility to the international airport and sea port, Panabo City has long been touted as the alternate site for industrial development because of its strategic geographic location. It can easily become a melting pot and the hub of business activity.

The municipalities of Carmen and Dujali shall provide agricultural support (crops and fisheries) for the cluster. At the same time these areas can provide an alternate route or gateway to Davao City, opening up new business opportunities. This cluster along with the Tagum cluster can likewise be made beneficiaries of a mass housing project.

The fourth cluster consisting of the entire Island Garden City of Samal is already identified as tourism area by the national government. With its declaration as a special economic zone, its conversion into a free port in the future is foreseen.

Given the opportunity to develop its well-endowed natural resources, this island city can easily attract vacationers and investors alike. In order to achieve this objective, better accessibility of going to and within the island city, telecommunications, power, water supply and other infrastructure utilities and services should be in placed in the years to come.

The Integrated Area Development Approach to planning recognizes the need to increase the access of rural population to basic services and facilities, and the need to specifically locate investments to create an integrated settlement system.

Specifically it aims to:

- a. accelerate growth in rural and lagging areas;
- b. distribute equitably the developmental gains among people and areas;
- c. strengthen market for agricultural goods and other rural resources;
- d. decrease the rate and alter the pattern of rural to urban migration;
- e. widely distribute services such as health, education, agricultural extension and other socio-economic amenities.

### 8.1 Protection Land Use Plan

**Scenario by 2022.** By the end of the planning period, Davao del Norte shall have rehabilitated at least 15 percent of its forest cover. This can be done by intensifying the existing forest management and rehabilitation programs and projects e.g. Upland Development Program, National Greening Program, Small Watershed Rehabilitation, Barangay Forest Protection and Management Scheme (BFPMS) and the implementation of the Tagum-Libuganon River Basin Master Plan in the entire province. Rehabilitating

the forest would protect the province from the effects of climate change such as drought, flood, and human interventions such as erosion and landslide. Further, its forest cover shall have served as a source of clean water for domestic and industrial consumption.

Environmental Impact Assessment of all proposed road sections traversing classified forestland shall have been fully imposed by the DENR as a pre-requisite for the approval of such projects. Existing roads and other infrastructure facilities and utilities within classified forestlands shall have also been assessed as to their environmental impact.

Mining operations in the forestlands shall have been strictly regulated and conducted with due regard to protection, development and utilization of other surface resources. Mining laws, rules and regulations of the DENR shall have governed the location, prospecting, exploration, utilization or exploitation of mineral resources in forest reservations.

Watershed shall have been well managed and protected. Denuded areas of existing proclaimed watersheds shall have been immediately reforested. Reforestation activities will enhance the adaptability of Davao del Norte to climate change.

## **Challenges**

### **1. Environmental Degradation**

- Non-demarcation of boundaries of protection areas

There is a need to establish and identify the boundaries on the ground of the identified protection areas in the province. The identification and demarcation of NIPAS areas, Non-NIPAS areas and the geo-hazard prone areas on the ground play a big role in the resolution of conflicts and in regulating the activities within these areas.

- Absence of forest land use and management plan

There should be a forest land use plan that will serve as guide or blue print for the proper management and utilization of the forest resources. Management schemes outlined in the plan should be given priority.

- Settlements within the identified forestlands

This is common in rural areas wherein there are settlements or barangays within areas classified as forestland. The economic activities made by settlers further degrade the fragile upland resources. Although, settlements are not really within the identified protection areas, but the unsustainable farming practices and cultivation made by these upland dwellers may threaten the upland resources as a whole including those identified as protection.

- Information, Education and Communication (IEC) Campaign.

The unsustainable farming practice in the uplands is somehow a product of poor information, education and communication campaign on the proper management of upland resources. Proper education on appropriate farming technologies coupled with strengthened extension services should be made in coordination with other institutions and stakeholders.

- Vulnerability of the forest sector to hazards brought about by climate change.

### **Objective**

- To strengthen the implementation of sustainable upland development program and increasing forest cover by 15 percent within the planning period.

### **General Policies and Strategies**

Polices and strategies shall be supportive of the following areas of concern:

- Forest and biodiversity resources management
  - Coastal and marine resources management
  - Environmental management
  - Water resources management
1. Classified forestlands with slopes 50 percent above and areas with elevation of above 1,000 masl shall be considered as permanent forest permanently covered with forest vegetation. Denuded areas falling under this category shall be subjected to immediate reforestation.
  2. Denuded areas classified as forestlands which are presently utilized for agricultural purposes shall be subjected to a detailed inventory and assessment by the DENR in coordination with DA and other concerned LGUs. All areas found to be suitable for agricultural use shall be subjected to agro-forestry, while those found not suitable for agriculture will be subjected for reforestation.
  3. Mining operation in the forestlands shall be strictly regulated and conducted with due regard to protection, development and utilization of other surface resources.
  4. Environmental Impact Assessments of all proposed road sections, road right of way and telecommunication facilities traversing classified forestland and hazard prone areas shall be submitted to the DENR and other appropriate agencies for review and approval as a prerequisite for approving the projects.
  5. Environmental protection and rehabilitation shall go along side with the enhancement of economic and human resources in the province.

## Strategies

1. Implementation of massive information, education and communication (IEC) campaign on the protection and rehabilitation of biodiversity as well as the ill effects of climate change in the province through coordination and networking with stakeholders such as the academe, NGO's/POs, religious groups, media, private sectors and other government institutions.
2. Certificate of Ancestral Domain Title (CADT) for identified CADC in the province shall be issued to ensure protection of the area from settlements encroachment.
3. Initiatives for the rehabilitation and management of the coastal ecosystem shall be strengthen in order to sustain and eventually improve the benefits that we all derive from coastal resources.
4. Integrated Land and Water Resource Management shall be adopted in watershed areas to improve the water supply, quality and forest cover of watersheds. A river basin management approach shall be adopted.
5. Rehabilitation and protection of forestland and conservation of watershed to minimize occurrence of flood, restore soil fertility to increase forest and agricultural production, promote water yield characteristics and conserve forest ecosystem.

## 8.2 Production Land Use Plan

**Scenario by year 2022.** The primary concern of the production land use plan is to provide adequate and accessible space for sustainable food crops production, industrial crops production for agri-processing, forest production and agri-tourism.

Agricultural lands for all uses will have totaled 158,990.80 hectares by the end of the planning period. This will represent 46 percent of the total provincial area, and 11.65 percent of the total regional area. Rice will have been grown within 22,182 hectares of fully irrigated and flood protected lands. Cavendish, local banana and coconut and other industrial crops will have been grown in 34,571, 12,377 and 39,650 hectares of lands, respectively. Agroforestry area with fruit trees and other industrial crops will have occupied 33,056.91 hectares within areas classified as forestland. Development of Talicud Island along with the vast potential in the mainland of the Island Garden City as a major tourist destination will be intensified.

## Challenges

### 1. Staple crop sufficiency

- Presence of over-used/unsustainable land use



Large track of over-used lands are found in the municipalities of New Corella and Asuncion. If the existing land use will not be altered, this will contribute further to the degradation of the area, causing low farm productivity and unfavorable economic returns. Appropriate farming system and technology should be implemented to arrest the problem of over utilization of the existing resources.

- Unsustainable Cultural Farming Practices

This is one of the factors that affect land degradation. The acceleration of the rate of land degradation caused by unsustainable farming practices is brought about by poor information dissemination on the importance of protecting the environment, improper use of modern technologies and even poverty and lack of livelihood opportunities. The insufficient means of alternative livelihood forces people to encroach on protection lands and marginal or not sustainable production lands.

- Conversion of agricultural lands to other uses and crop shifting

The irreversible conversion of agricultural lands into other uses is due to the increasing demand for settlements and other facilities brought about by urbanization. Increasing demand for housing, commercial establishment, industry and other social services and facilities in urban areas are just some of the reasons of conversion.

Crop shifting from staple crop (rice) to export banana (Cavendish) also has affected the agricultural land and its utilization in Davao del Norte in the recent years. Lands devoted for rice production have reduced by 11,977 hectares from the 2000 data. The decision of the farmers to shift from rice to banana production is a threat to food security.

## **2. Vulnerability of the crop production areas to hydrometeorological and geologic hazards.**

Flooding affects mostly agricultural areas in the lowland. Flood mitigation measures have to be implemented. Rice areas affected by flooding that cannot be controlled in a cost-efficient way should be converted into inland/fishpond development. Crop production areas are also exposed to ground shaking, and liquefaction that may affect cropping pattern and production.

### **Objectives**

- To limit crop shifting from staple crop to commercial and industrial crops..
- To increase farm productivity of 22,182 hectares of rice area through the use of appropriate technologies and farming systems.
- To provide general land use policies that will help control and manage physical development in order to promote social equity and encourage environment friendly and more sustainable development endeavors.

- Protect and make adaptable, 30,687.79 hectares of production area from flooding and other geologic hazards within the next 15 years.

### **General Policies and Strategies**

1. Those areas with slope of 18-30 percent and presently vegetated with grasses, shrubs and brushes have to be maintained as agro-forest areas. New cropping system and crop combination will be introduced in those areas. Fast growing hardwood and fruit bearing trees are recommended for agro-forestry areas.
2. In areas with 8 to 18 percent slope, crops requiring minimal cultivation will be encouraged. Diversified field crops are recommended for intercropping soil control measures like terracing, buffer strip cropping, contour tillage and other variation of the sloping agricultural land technology as well as other techniques on soil and water conservation measures will be introduced.
3. For production lands with slopes of 0 to 8 percent, intensive crop production will be sustained. Those areas are mostly planted to rice, coconut and Cavendish banana. Intensive farming systems will require the development and introduction of new farming systems that will preserve land fertility and maintain productivity.
4. Local land suitability analysis should be pursued to identify lands suited for specific industrial requirements, including required expansion areas. Marginal agricultural lands should be prime candidates for industrial expansion.
5. Industrial activities must be restricted in SAFDZ, NIPAS areas and other similarly protected areas, and hazard prone areas that have been identified to be risky for industrial activities to take place (e.g fault lines, erosion-prone areas, flood-prone areas).
6. Regulation on crop shifting especially from staple crop to commercial and industrial crop. Crop shifting has resulted to substantial decrease of areas devoted to rice production and has increased the areas devoted for Cavendish banana. This massive conversion of land due to crop shifting must be given due attention by the lawmakers both in the national and local level.

### **Strategies**

1. Rice Intensification Program. This aims to increase the production of the staple crop even with the reduction of the area devoted for rice production. This strategy has several components namely: rice seed system/subsidy, irrigation and water management, post harvest facility assistance, extension services and training, and technical support. Rice intensification programs also aims to: a) sustain food security, b) reduce poverty incidence among rice farmers, c)

increase net farm income to avoid crop shifting, and d) to ensure sustainability of the resource base.

2. Integrated farming system in the form of intercropping, multiple cropping and relay cropping will be strengthened. Promotion of multiple cropping technologies within monocropped areas will be vigorously pursued. Integration of livestock raising in every farming activity will be pursued using improved grasses and legumes
3. Application of SALT technology in upland farming shall be strengthened. Identified crops within this slope category will include banana, citrus and other fruit trees and improved grasses and legumes for cut and carry livestock growing.
4. Rehabilitation and improvement of existing irrigation systems while rainfed and potential areas will be provided with irrigation facilities.
5. Coconut areas within the slope category beyond 18 percent will be recommended for intercropping with permanent fruit bearing trees and plantation forest species.

### **8.3 Settlements Development Plan**

**Scenario by 2022.** A network of settlements shall be developed with Tagum City as the Regional Center, Panabo City and Island Garden City of Samal as Subregional Centers; Provincial Centers are the municipalities of Sto. Tomas, Kapalong, Carmen and Asuncion. The rest of the municipalities are identified as Local Centers or tertiary growth centers.

Tagum City shall be a highly urbanized city to serve as the province and the region's commercial and trading center in the north, as well as an alternative settlement area to decongest Davao City. Also, it will provide area for agro-industrial development and socio-economic requirements, particularly social, administrative and infrastructure services of the province and even the region's other municipalities including the three coastal municipalities of Compostela Valley Province.

The various services required of an expanding population in the less urbanized and rural municipalities will be catered by the most urbanized centers and secondary growth centers. Panabo City is envisioned to be the commercial and trading center northeast of Davao City, the region's metropolitan center. The Island Garden City of Samal will continue to strive to be self-sufficient in basic social services while maximizing the use of their agriculture and tourism bases. IGACOS shall become the region's major tourist destination.

#### **Challenges**

- a. Rapid urbanization of major growth centers

The rapid urbanization in Tagum City and Panabo City and the municipality of Sto. Tomas is due to the increased economic activities and population growth in these areas. Panabo City due to its proximity to Davao City has become the catchments site for spill-over economic activities. Tagum City as the capital of the province continues to provide tertiary level services not only to the people of Davao del Norte but also of the neighboring provinces of Compostela Valley and Davao Oriental in Southern Mindanao Region and even part of Agusan del Sur in Caraga Region.

Rapid urbanization also affects the land use in major growth centers. The irreversible conversion of prime agricultural lands to urban use is due to the proliferation of housing projects especially in major growth centers. Commercial and industrial establishments also sprout with them on these lands. Unfavorable economic return in farming ventures is also a factor that contributes to irrational conversion of agricultural lands.

b. Inadequate basic services and facilities in rural areas

Basic services and facilities remain inadequate especially in rural areas. Foremost of these are potable water supply, power supply facilities, road network and other social infrastructure facilities. Inadequacy of these facilities likewise limits the expansion of settlements in these areas.

Mobility between rural areas is still a problem because of inadequate road network that would provide better access to the commuting public. Limited motor vehicles ply the routes to many rural areas in the province because many of the roads are either poorly maintained or have not been upgraded or rehabilitated. Motorcycles or “habal-habal” are the common mode of transportation in rural areas. The capacity of “habal-habal” to transport passengers and cargo is very limited, thus affecting travel time and efficiency in the flow of people, goods and services within the rural areas and limiting the ability of settlements to provide support to other settlements.

c. Emergence of Social and Environmental Problems Associated with Settlements  
Growth and exposure of the settlement areas to hazards such as flooding, ground shaking, rain induced and earthquake induced landslides and liquefaction.

Synonymous to urban growth is the increase in social and environmental maladies brought about by such development. Presence of informal settlers contributes to congestion in urban areas and the problems on right of way acquisition, since most of these settlers are locating their residence in areas allocated for road right-of-way. Unsanitary practice and disposal of human and industrial wastes is also one of the ill effects of urbanization. Strict implementation of RA 9003 especially in urban centers have somehow lessens the problem on waste disposal.

Presence of settlement in areas identified as forestland adds more pressure to the already fragile ecosystem in the uplands. The result is the degradation of the forestland due to man’s unsustainable practices and activities, which caused the forest cover to degenerate. As a result, natural disturbances occur such as severe soil erosion with

sediments clogging the waterways and water bodies, destruction of mangrove, marine and coastal resources; flooding, reduction of biological diversity and wild life habitat, degradation of watershed, which threaten water supply condition and quality; and affecting climatic patterns.

The province's lowland area where settlements are mostly concentrated is frequently affected by flooding. Forest denudation and narrow watershed are among the factors that contribute to flooding.

Frequent flooding affects productive agricultural lands and urban areas along the mid-to-lower reaches of major rivers. Implementation of flood mitigating measures and other activities to reduce the effect of disaster in the future should be given priority and due consideration.

- d. Impacts of increases in population to land use:
- Increasing population will demand additional areas for food production, for habitation and other developmental needs. Trade off between land uses will necessitate judicious adjustments that planning and legislations must support.
  - There will be growing demand for land to locate basic social services like schools, hospitals and shelters.
  - Populations may intrude into protected areas and conduct activities that will cause irreversible damages to the ecosystem. Others will be force to settle in hazard-prone and high risks areas.
- e. Risks posed by hazardous environmental conditions threaten to reduce safer lands to accommodate development efforts. Hazardous conditions in development opportunity lands limit the utilizations of these lands, thus putting pressure of exceeding the carrying capacities of safer lands.
- f. Safer environment pertains to safeguarding lives and properties; a prime consideration in land use planning.

### **Objectives**

- Rationalize land conversion in urban centers and major growth areas.
- Provide adequate social services and facilities in rural areas including relocation areas for household living in high risk areas.
- Restrict or regulate settlements in areas lying within the coastal zone, river banks, flood prone and other environmentally constrained areas.

### **General Policies and Strategies**

1. To effect a rational distribution of population, provision of services and economic facilities especially in identified growth areas should be strengthened so as to encourage and spur the movement of people in still less-habited areas.
2. Urban centers whose further growth may be encouraged include all the identified secondary and tertiary growth centers. These centers will be given priority considering their designated functions. Functions still not present within these centers will be provided to maximize their functionality.
3. Urban centers whose growth must be restrained/restricted include:
  - All settlements within the production forest. These settlements are in the municipalities of Kapalong, Talaingod, San Isidro, Asuncion, New Corella and the rural settlements of Sto. Tomas.
  - Settlements lying within the coastal zone. Although, Davao del Norte has no history for tsunami, but areas within the coastal zones are prone to this hazard. These settlements are in Island Garden City of Samal, and the coastal barangays of Tagum City, Panabo City and Carmen.
  - All urban centers which are surrounded by prime agricultural rice lands. These are the poblaciones of B.E. Dujali , Carmen, New Corella, Asuncion and Sto. Tomas. Some barangays of these municipalities can have urban expansion as indicated in the proposed settlements map.
  - Settlements in areas highly prone to flooding, landslides and liquefaction because of the potential risks to lives and properties.
4. In identifying future industrial sites, some specific considerations will include the following: (a) the relationship of industrial site with adjoining and other relevant land uses; (b) availability of appropriate skilled labor; (c) capacity of the community to provide housing and other service requirements; and (c) potential market for the outputs to be produced from the site.
5. Industrial ecology should be promoted. This requires the clustering of industries that have backward linkages wherein the wastes or by-products of one industry can be utilized by another industry. Clustering would also allow cost-sharing scheme in the construction and operation of waste-water treatment plants.
6. There should be sufficient infrastructure support facilities (farm to market roads, power, water, flood control and drainage, and waste disposal) especially in rural areas or tertiary urban centers.
7. There is a need to strengthen disaster and risk management programs and activities to enhance the preparedness of the populace in case of the occurrence of disaster. Preparatory activities should be conducted to minimize the impact of disaster. Prevention of loss of lives or heavy damage to properties must be the prime concern.



Among the mitigating measures to be undertaken are:

- a). Relocation of residents occupying the riverbanks to a safe settlement site;
- b). Establishment of buffer strips by planting trees along the riverbanks; and
- c). Implementation of all erosion and flood control measures.

#### **8.4 Infrastructure Development Plan**

Basically, the infrastructure plan is based on the development challenges, issues and concerns confronting the development of the province. These could be achieved through spatial development strategies and supporting policies and with corresponding programs and projects.

The order of priority of physical development shall be:

- Maintenance and upgrading of existing infrastructure facilities to extend the life span of the project and thereby generate more productive use of assets
- Construction infrastructures that will address the effects of climate change and disasters.
- Retrofitting of critical facilities and utilities to make it climate change adaptive and disaster resilient.

#### **Challenges**

##### **1. Poor access to basic infrastructure services and social facilities**

- Limited and Poor Road Condition in Rural Areas

There is a need for the opening of new farm-to-market roads and the improvement of existing road network especially in rural areas to provide better access and linkage within and outside the province. Priority should be provided in municipalities which road densities are below the national standard.

- Inadequate Flood Control and Drainage Facilities

The province lowland area is frequently affected by flooding. It affects productive agricultural lands and along mid-to-lower reaches of major rivers. Protection dikes have to be constructed in areas along the major rivers of the province to minimize if not totally prevent the destructive effects of flooding. Flood control facilities as part of the short to medium term plan, should be implemented vis-a-vis with the rehabilitation, protection and conservation of the uplands.

- Limited Access to Power/Energy

While 100 percent or all of the barangays in Davao del Norte have electricity, there is still a need to energized 21.68 percent of the total households in the province. These households are mostly located in rural areas.

- Limited access to potable water

Low access to potable water is still a major concern especially in rural areas. While majority of the households in the urban centers have access to potable water, insufficiency or lack of it remains a major concern of the rural communities. The province has substantial sources of potable water that remains to be developed or tapped.

- Limited access to social and other infrastructure facilities

The inadequacy of education, health and housing facilities affects the quality of education, health condition and welfare of the people in the province. Tertiary facilities and services are concentrated in the major urban centers. Classroom requirement for the secondary education has to be upgraded in order to at least meet the standard requirements of the education department.

- Exposure and vulnerability of lifelines and other critical facilities and services to various hazards

### **Objectives**

- Increase inter and intra-provincial linkages within the planning period.
- Increase household power connection by 100 percent within 5 years.
- Reduce classroom deficiency by 50 percent within 10 years.
- Upgrade hospital services and facilities in the three districts within 3 years.
- Enhance basic social services and facilities in all barangays within the planning period.
- Provide sufficient potable water supply in major centers within 10 years.

### **General Policies and Strategies**

1. The overall strategy of the plan is geared towards enhancing the infrastructure requirements of the province. The required inter-provincial linkages, particularly those among urban centers shall be maintained in order to increase access to alternative product sources and markets, allowing for increased competition and greater economic integration.
2. The type and scale of new infrastructure facilities shall be consistent with or in support of the desired spatial pattern for a specific plan period. Likewise,

infrastructure shall be used to induce or effect the realization of the desired spatial pattern.

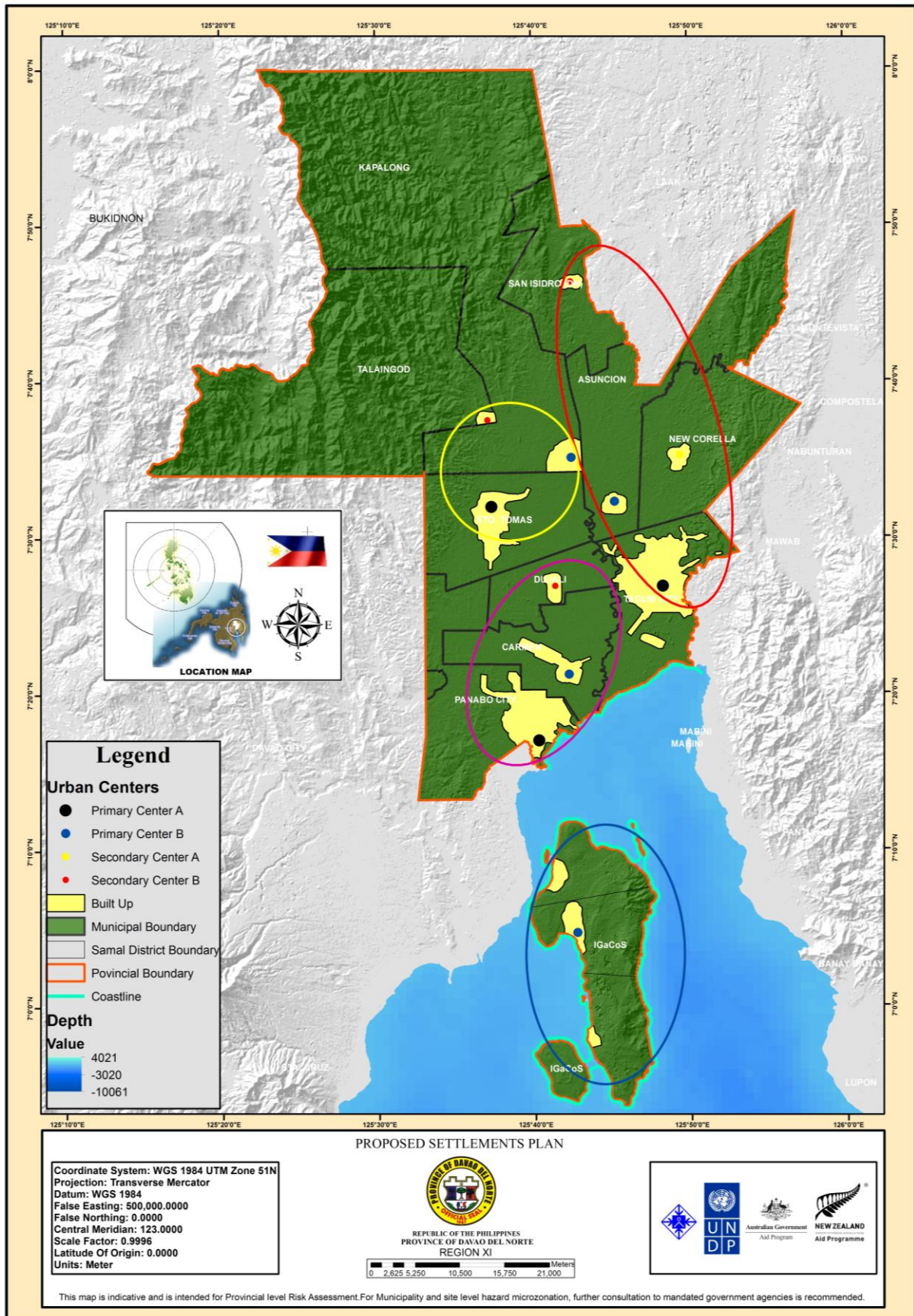
3. The transportation network of the province shall be so designed to link the growth poles, production areas and other strategic development areas.
4. The location of new infrastructure shall as much as possible, avoid disturbing critical ecosystems and hazard prone areas. In cases where this does not apply, appropriate mitigation measures shall be incorporated in the project design.
5. Local officials must ensure that all existing building and those to be constructed should conform to building standards particularly in areas that is high risks to earthquakes and other hazards.
6. To meet the demand of increased business activity in the major growth centers, infrastructure support facilities in the form of improved drainage, sewerage, water, irrigation and telecommunication facilities would have to compliment the road network enhancement.

### **Strategies**

1. Maintain and/or provide new infrastructure facilities (e.g. access and social infrastructure) in production and settlement areas to facilitate socio-economic activities.
2. Upgrade and /or provide new infrastructure facilities in rural areas to facilitate development and encourage investment outside of the major growth centers.
3. Enhance inter-provincial and intra-provincial linkage by upgrading the existing transport facilities.
4. Construction of appropriate infrastructure that would prevent flooding in high risk areas. Flood mitigation structures are important to safeguard the population, settlement and agricultural areas.
5. Develop an integrated provincial water supply system tapping available and viable sources of surface water from the major rivers in the province. The provision of safe, potable and sufficient water supply for domestic, commercial, recreation and industrial use shall be one of the prime considerations within the planning period.
6. Land banking for housing and other social services and facilities.
7. To enhance development of tourism industry in the Island Garden City of Samal. Improvement of accessibility of going to and within the island should be given priority. Improved telecommunication and infrastructure facilities and utilities should be in place within the planning period. As a Freeport, this city would be the

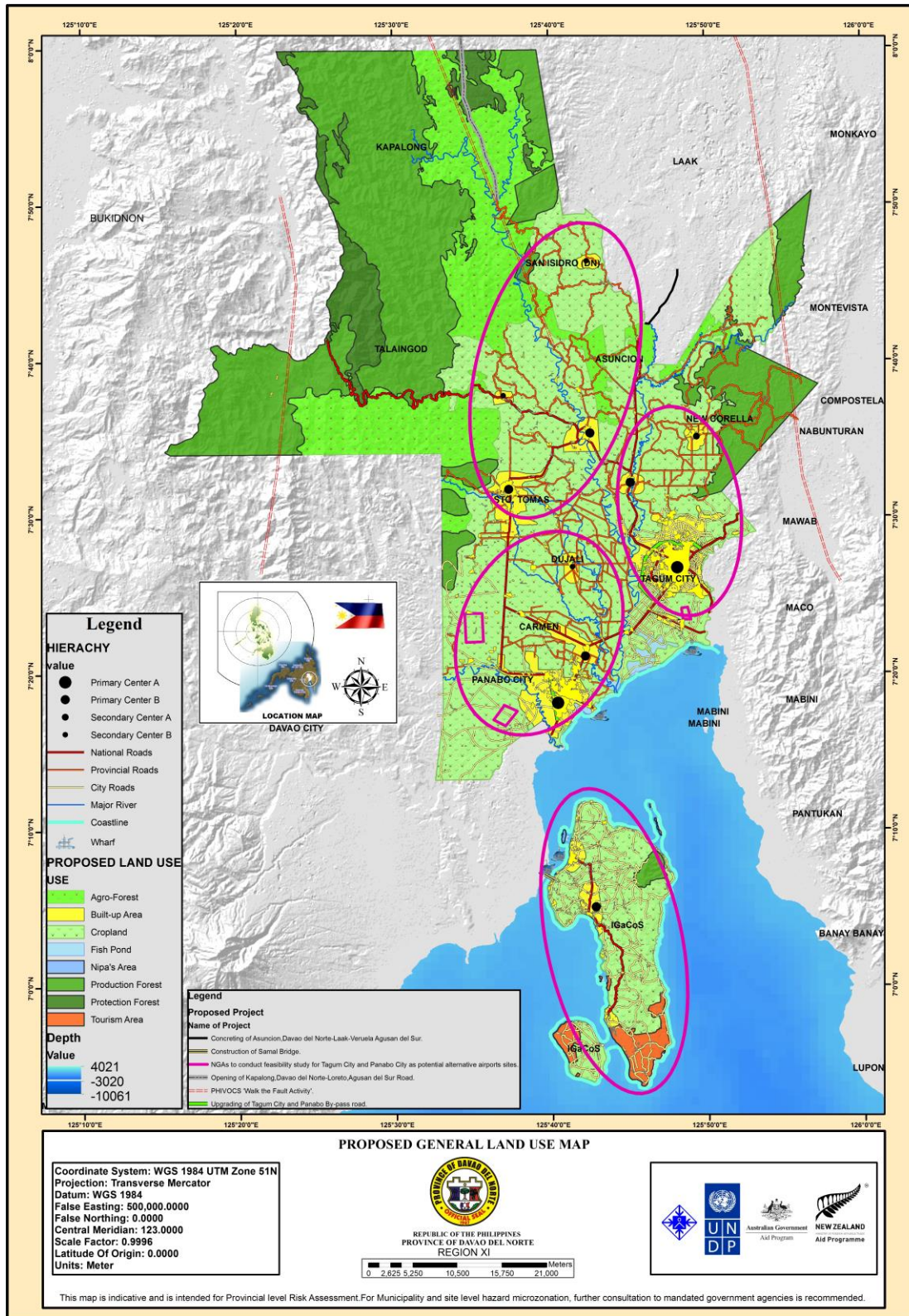
link and the jumping board of Davao del Norte into other areas of the country and even to other areas in the world.

Map 50 : PROPOSED SETTLEMENTS MAP , Davao del Norte





Map 51 : PROPOSED GENERAL LAND USE MAP, Davao del Norte





## Planning Strategies and Plan Phases

### Medium – Term Planning Strategy (Phase I: 2014-2016)

#### Protection Land

- a. Conduct massive information, education and communication (IEC) on the protection and sustainable management of the environment through coordination and networking with stakeholders such as the academe, NGOs/Pos, religious group, media, civil society and other government institutions.
- b. Ensure preservation and protection of identified CADC areas in the province. Because CADC's are located in the forestland, occupying an extensive land area, management of CADC in an environmentally sound manner is critically important. Issues and concerns affecting claimants and beneficiaries should be properly addressed.
- c. Undertake strict regulation of mining operations with due regard to protection, development and utilization of other surface resources.
- d. Implement strictly Environmental Impact Assessment for all proposed road sections, road right of way and telecommunication facilities traversing areas classified as forestlands and environmentally critical areas.
- e. Strict implementation of the Environmental Code of Davao del Norte.

#### Production Land

- a. Rice intensification program to enhance production of staple crop.
- b. Promote integrated farming system in the form of intercropping, multiple cropping and relay cropping. Integration of livestock raisings in every farming activity will be pursued using improved grasses and legumes.
- c. Strengthen the implementation of Sustainable Upland Development (SUD) technologies in upland farming.
- d. Improve coconut production through intercropping and fertilization.
- e. Support the implementation of Aquaculture Promotion Program in the following areas identified by the RFPF: B.E Dujali, New Corella, Carmen, Island Garden City of Samal and Panabo City.
- f. Strengthen the implementation of coastal rehabilitation programs and projects like mangrove reforestation and coral reef rehabilitation, and strengthen fisher-folks for fisheries and coastal resource management.

**Settlements**

- a. Ensure the adaptability of infrastructure projects and critical facilities to climate change and other hazards both man made and natural.
- b. Strengthen disaster and risks management programs and activities to enhance preparedness of the populace in case of the occurrence of disasters.
- c. Enhance public and private collaboration and coordination in settlements planning with special considerations for the environment and risks management.
- d. Restrict expansion of settlements in environmentally critical areas (hazard prone areas) and in areas surrounded by prime agricultural lands.
- e. Ensure implementation of environmental laws and regulations to achieve ecologically-balanced and pollution free environment in all settlements and to enhance the adaptive capacity and risk resiliency of the community.

**Infrastructure Development**

- a. Maintain and/or provide new infrastructure facilities (access and social infrastructure) in production and settlement areas to facilitate socio-economic growth.
- b. Upgrade and/or provide new infrastructure facilities in rural areas to facilitate development and encourage investment outside the major growth centers.
- c. Enhance inter-provincial and intra-provincial linkage by upgrading the existing transport facilities and constructing new ones.
- d. Improve other infrastructure services and utilities such as power, telecommunications and water supply to enhance economic development in the province.
- e. Rehabilitation of existing flood control projects.
- f. Conduct of Feasibility Study for the Construction of Samal Bridge.

**Medium to Long-Term Planning Strategy (Phase II: 2014-2022)**

**Protection Land**

- a. Conduct detailed inventory and assessment by the DENR in coordination with DA and other concerned LGUs, of denuded areas classified as forestlands which are presently utilized for agriculture. All areas found to be suitable for agriculture will

be subjected to agro-forestry, while those found not suitable for agriculture will be subjected for reforestation.

- b. Initiatives for the rehabilitation and management of the coastal ecosystem shall be strengthened in order to sustain and eventually improve the benefits derived from coastal resources.
- c. Adoption of an Integrated Land and Water Resource Management. Local capacities for land and water resource management should be enhanced, involving all stakeholders in the process of sustainable management.
- d. Conduct intensive assessment and mapping of all environmentally constrained areas and formulate a disaster mitigating and preparedness plan at the barangay and municipal level.

### **Production Land**

- a. Strengthen Research and Development (R&D) for crops and fishery products in collaboration with other research institutions and academe.
- b. Rehabilitation and improvement of existing infrastructure facilities and utilities to support agriculture production.
- c. Improvement and maintenance of infrastructure facilities and services that will enhance tourism development in the mainland and Island Garden City of Samal.
- d. Promote banana industry in the province by strengthening its position as top producer of export quality banana products in the country.
- e. Promote banana chips industry in the province for local and export market.
- f. Development of areas appropriate for agriculture and livestock production. This will require the development of new farming systems that will preserve land fertility and maintain productivity.

### **Settlements**

- a. Development of secondary and tertiary growth centers capitalizing in the strengths and opportunities inherent in the areas to spur economic growth and encourage the movement of people in less-inhabited areas. Major growth centers should be developed hand in hand with their satellite areas so as to avoid excessive concentration of settlement in the urban centers.
- b. Development of the nodal growth center into specialized areas with consideration of their potential:

- Tagum City – prime business and service center
  - Panabo City – industrial center
  - Sto. Tomas – trading and agro-industrial center
  - Island Garden City of Samal – tourism area
- c. Maintenance and modernization of existing infrastructure facilities for maximum efficiency and cost effectiveness in urban and rural areas.
- d. Promotion of industrial ecology thru clustering of industries that have backward linkages.
- e. Allocation of appropriate areas for urban settlement and rural development. In view of the limited land resource base, action plan and investment program relative to land use have to be responsive to the requirements of sustainable development and climate change.

### **Infrastructure Development**

- a. Construction of appropriate infrastructure such as dikes, canals and drainage to prevent flooding. Flood mitigation structures are important to safeguard the population, settlement and agricultural areas.
- b. Develop an integrated provincial water supply system tapping available and viable sources of surface waters from the major rivers in the province. The provision of safe, potable and sufficient water supply for domestic, commercial and industrial use shall be one of the prime considerations within the planning period.
- c. Land banking for housing and other social services facilities.
- d. Improvement of accessibility of going to and within the Island Garden City of Samal in support of the tourism industry thru the construction of Samal Bridge.

### **Long – Term Planning Strategy (Phase III: 2014-2022)**

#### **Protection Land Use**

- a. Rehabilitate and protect forestland and conserve critical watershed to minimize occurrence of flood, restore soil fertility to increase forest and agriculture production, promote water yield characteristics and conserve forest ecosystem.
- b. Develop and manage ancestral domain areas as stipulated in the IPRA Law or RA 8371.
- c. Relocate settlements and prevent encroachment in identified high risks areas to prevent damage to people and properties.

- d. Intensify IEC on proper and sustainable management of the environment and provision of appropriate farming technology that will enhance the community's management and adaptability to risks and hazards.
- e. Declare areas with slopes 50 percent above and areas with elevation of above 1000 masl as protection forest permanently covered with forest vegetation. Denuded areas falling under this category shall be subjected to immediate reforestation.
- f. Conduct massive IEC on the value of disaster mitigation, preparedness and response.

### **Production Land**

- a. Introduce new cropping system in areas with slopes of 18-30 percent and presently vegetated with grasses/shrubs. These areas will be maintained as agro-forest areas planted with fast growing hard wood and fruit bearing trees.
- b. Protect and rehabilitate watershed areas, river banks and coastal areas.
- c. Strengthen implementation of protective infrastructures like dikes, drainage, tree growing along river banks and other flood mitigating projects.
- d. Improve Research and Development (R&D) for cacao production and diversification of cacao products from tablea to chocolate, cocoa powder and other related products.
- e. Promote clustering of industries that have backward linkages wherein the wastes or by-products of one industry can be utilized by another industry. Clustering would allow cost-sharing scheme in the construction and operation of waste-water treatment plant.
- f. Develop and promote areas with potential for tourism in the mainland and the Island Garden City of Samal with special consideration to human and environmental protection.

### **Settlements**

- a. Ensure rational distribution of population, provision of services and economic facilities in all settlement areas.
- b. Implement a sustainable management of urban and rural environmental problems associated with settlements growth.
- c. Enhance agricultural production to discourage conversion and limit crop shifting.

**Infrastructure Development**

Develop the Island Garden City of Samal as a Freeport to serve as the link and jumping board of Davao del Norte into other areas of the country and even the world.

- a. Construction of Samal Bridge that will connect Island Garden City of Samal to Davao del Norte mainland
- b. Conduct study on the establishment of the Light Rail Transit along Tagum City-Panabo City-Davao City-Digos City route.
- c. Undertake continuous upgrading and maintenance of road networks in urban centers and rural areas for better management of risks and hazards.
- d. Upgrade existing government-operated ports in Samal Island to better accommodate the people and the products being transported to and from the island.





CHAPTER 4

# Local Government Administration



## **9.0 LOCAL GOVERNMENT ADMINISTRATION**

Local Government Administration includes the analysis of the organizational structure, fiscal management, regulatory and legal controls of the provincial government. This should not only be treated as one of the planning sectors but as an integrating system for the prioritization and eventual implementation of all identified development programs, projects and activities within the province. With the integration of climate change adaptation and disaster risk reduction and management to this plan, a discussion on the organizational and fiscal arrangements towards disaster preparedness is a vital component.

Republic Act No. 7160 or the Local Government Code of 1991 mandates a local governance that promotes transparency and accountability in local government administration and in the delivery of the basic services that are responsive to the needs of the constituents. In line with this the National Government has been instituting mechanism in recognizing LGU performances towards achieving the desired local government administration. Under the Local Governance Performance Management System (LGPMS) designed by the Department of the Interior and Local Government (DILG), Davao del Norte garnered the Department's Seal of Good Housekeeping (SGH) Award for two (2) consecutive years from CY 2012 to 2013.

In CY 2014, the Seal of Good Housekeeping was upgraded to Seal of Good Local Governance (SGLG). It is a recognition of LGU good performance not only on financial housekeeping, but also on other areas that directly benefit the constituents. It is a continuing challenge for the LGUs to achieve a desirable condition to sustain the practice of transparency and accountability in the use of public funds; to prepare for challenges pose by disasters; to demonstrate sensitivity to the needs of vulnerable and marginalized sectors of society; to encourage investment and employment; to protect constituents from threats to life and security and to safeguard the integrity of the environment. Davao del Norte is aiming forward to this state of excellent performance, the Seal of Good Local Governance.

Davao del Norte also considers the institutionalization of e-governance to hasten the delivery of services and as a tool to hasten decision making and advancement in public fiscal management . Initial operational systems are already in place however these need further enhancement and inter-connectivity with other areas.

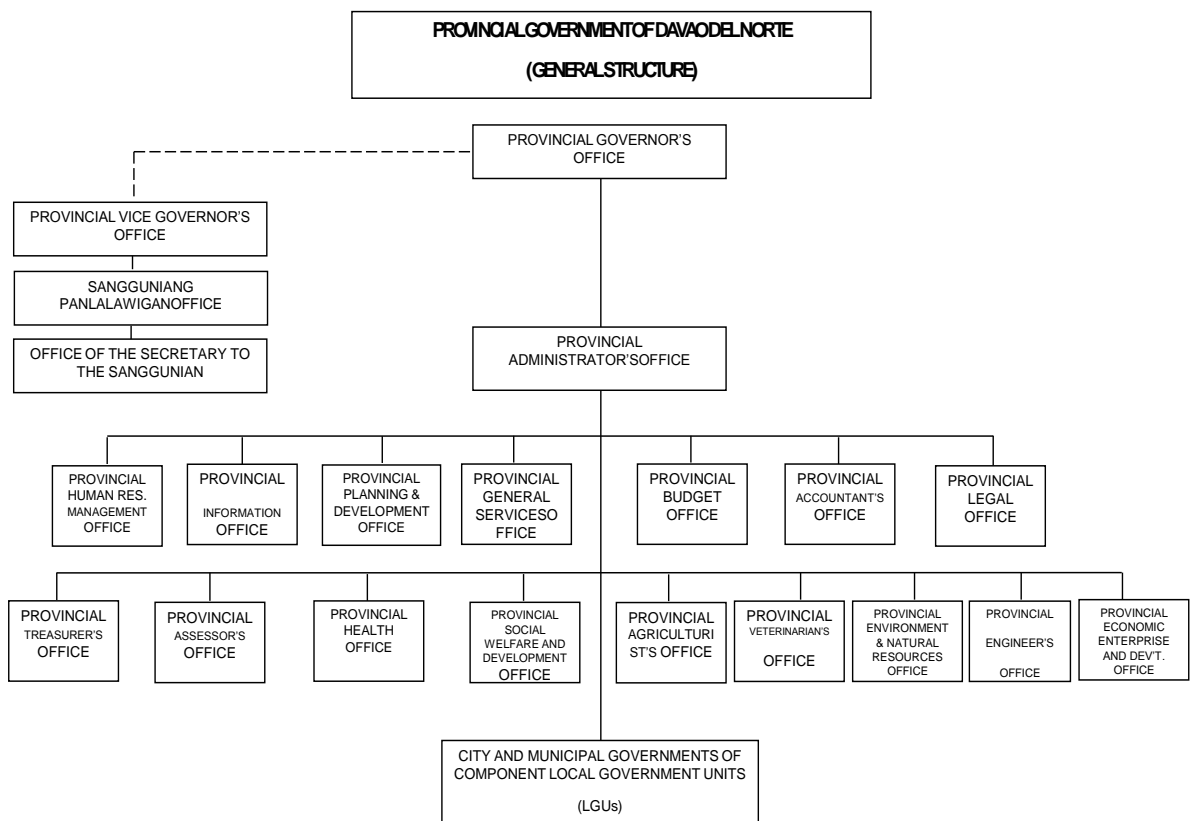
Competency of the workforce is another avenue for development interventions. This is in close coordination and collaboration with the Civil Service Commission and other stakeholders.

**9.1 Organization and Development**

**Organizational Structure**

The Provincial Government of Davao del Norte has twenty-one (21) offices both in the Executive and Legislative departments. In the latest provincial reorganization, the Provincial Economic Enterprise and Development Office (PEEDO) was established to manage the income generating endeavors of the province.

Shown in Figure No. is the Organizational Structure of the province. It shows a hierarchy of the different offices in the Provincial Government of Davao del Norte.



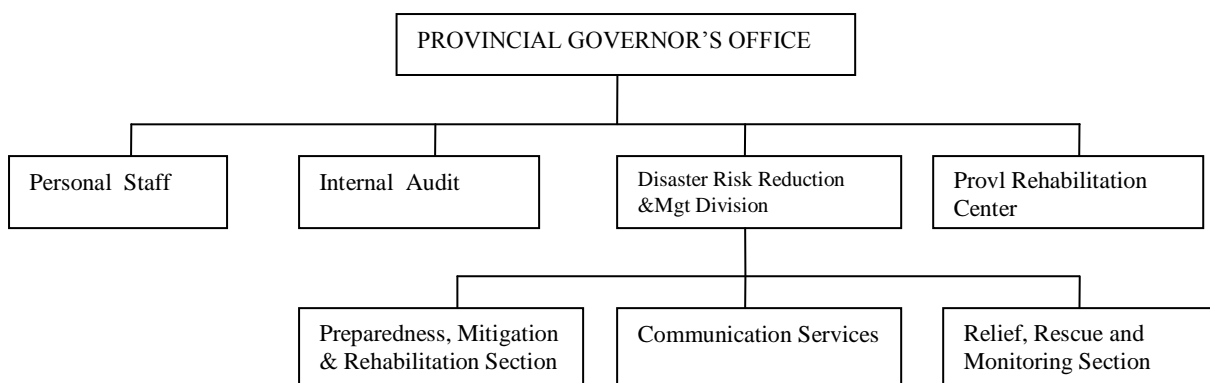
The Provincial Economic Enterprise Development Office (PEEDO) was created by virtue of Provincial Ordinance 2011-002 in line with the partial reorganization of the province. PEEDO absorbed the 3 hospitals, blood bank and health insurance services units from the Provincial Health Office (PHO) and are recognized as local economic enterprises. PEEDO started operating in February 2012. The Office has contributed to the major source of local income from services rendered.

Local government units (LGUs) are expected to be at the frontline of emergency measures in the aftermath of disasters to ensure the general welfare of its constituents, according to the Local Government Code of 1991. As first responders, LGUs should be proactive in performing

disaster-related activities, from preemptive evacuation to the restoration of people's livelihood.

The establishment of Local Disaster Risk Reduction and Management Office (LDRRMO) as mandated under Republic Act. No. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010, has been established but as a Division Unit under the Office of the Governor. Several position items were created but only the Division Head item was funded. Staff complementation for disaster preparedness has been made through detailing of staff from other offices.

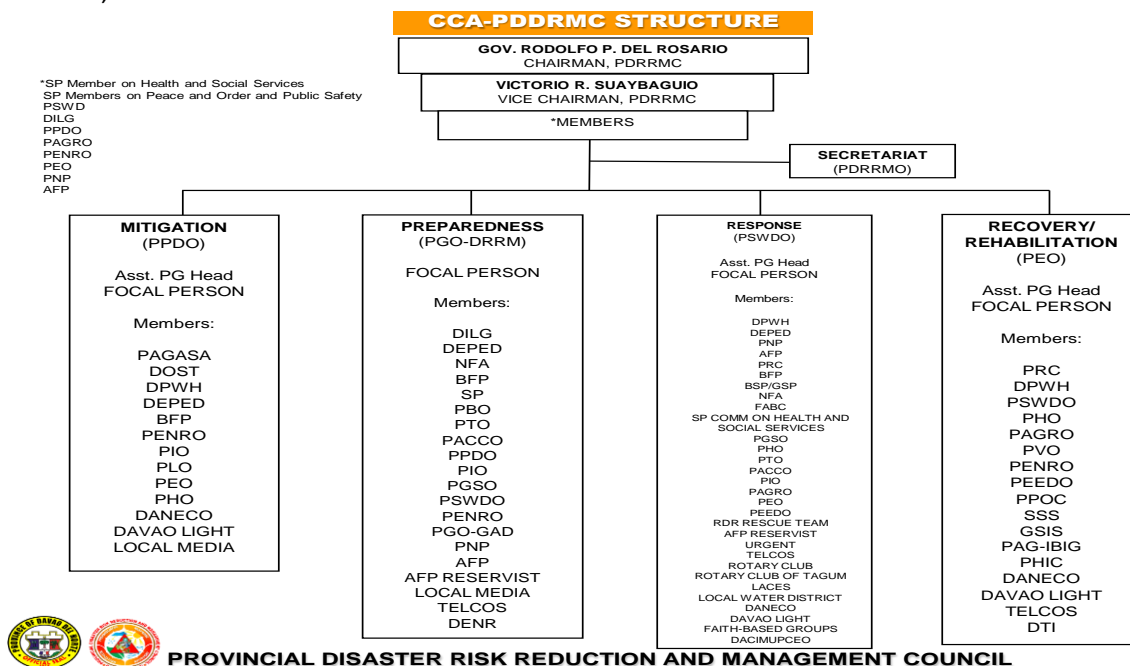
Fig. No. 40  
LDRRMO Structure  
Office of the Governor



The mandated Provincial Disaster Risk Reduction and Management Council of Davao del Norte is functional and supervises the operation of the Provincial Operation Center through its Executive Director. The Council meets regularly and discusses vital matters regarding the measures in reducing the negative impacts of disasters and in empowering the communities and the organization towards disaster risks reduction.

The composition of the PDRRMC of Davao del Norte is in accordance to the mandates of Republic Act No. 10121, or the Philippine Disaster Risk Reduction and Management Act of 2010. Active participation of the non-government organizations, civil society, volunteer groups and other government entities is highly manifested through their attendance to the Council activities.

Figure No. 41  
PDRRMC, Davao del Norte



**Human Resource Development**

As of December 2014, Davao del Norte has a total workforce of 1,930 with 834 (422 male and 412 female) or 43.21% having plantilla positions and 356 (275 male and 81 female) having casual status of employment. Meanwhile, a total of 740 (535 male and 205 female) provincial staff are having contract of service/job order and honorarium based status of employment. Please refer to Table No. below.

Table No.4-1. **Provincial Paid Workers by Type of Appointment**  
Davao del Norte CY 2014

Type of Appointment	No. of Staff	Male	Female	%
Plantilla Positions	834	422	412	43.21%
Permanent	756	365	391	
Co-terminous	63	44	19	
Elective	15	13	2	
Casual	356	275	81	18.44%
Contract of Service/ Honorarium/Job Order	740	535	205	38.34%
<b>TOTAL</b>	<b>1,930</b>	1,232	698	100%
		63%	37%	

Source: Provincial Human Resource Management Office

The workforce in the province is male dominated having 1,232 or 63% male workers and only 698 or 37% are female. However, decision makers or department heads of the twenty offices are equally occupied by both male and female officers. There are only two (2) female Legislators in the provincial level.

Human resource management is anchored on Civil Service Commission (CSC) rules and regulations and is working on Program to Institutionalize Meritocracy and Excellence in Human Resource Management or PRIME-HRM. The province has maintained its Level II Accreditation Status of the Civil Service Commission and is granted the authority to take final actions on appointments.

In response to the call on performance-based management, the province has been implementing its Agency Strategic Performance Management System (SPMS). Individual and office performances are geared towards achieving the goals and objectives defined in the provincial development thrust .

The province acknowledges that human resource is a vital component in addressing the needs of its constituents and in the delivery of the required services thus competencies of the workforce have been given importance. A competency-based Human Resource Development Plan was institutionalized for this purpose.

## **9.2 Local Financial Management**

The Province of Davao del Norte is classified as a First Class Province according to Department Order No. 20-05 dated July 29, 2005 of the Department of Finance. Although having a limited taxing power compared to cities and municipalities as authorized in the Local Government Code of 1991, it has managed to maintain its classification.

### **Public Finance Management Assessment**

Using the Public Financial Management Assessment Tool (PFMAT) developed by the Department of Budget and Management (DBM), which looked into the financial management performance of provinces along the seven (7) dimensions, i.e., a) policy-based budgeting, b) comprehensiveness and transparency, c) credibility of the budget, d) predictability and controls in budget execution, e) accounting, recording and reporting, f) internal and external audit, and g) citizen participation, the performance of Davao del Norte was evaluated in 2013.

The overall average score of 2.92 points discloses that Davao del Norte has attained a remarkable level of performance in financial management. Among the seven indicators, credibility on the budget, and citizen participation posted the highest score at 4.00 points each, followed by policy-based budgeting with 2.33 points while predictability and control in budget execution, more particularly on value for money and controls in procurement got zero (0.00) point. The area on internal audit needs priority consideration in local governance. Please refer to Table No 3-242.



*Table 4-2. PFMAT Assessment of the Province of Davao del Norte, DBM 2013*

D1 – Policy-based Budgeting	Dimension	Indicators and Sub Indicators	Score
D2 Comprehensive-ness and Transparency	1.Comprehensiveness of budget information contained in the Appropriation Ordinance covering the Annual Budget 2. Public access to key information	4	4.00
		4	
D3 Credibility of the Budget	3. Actual revenue collections compared with estimated revenues in the budget 4.Actual expenditures compared with appropriation by allotment classification	4	4.00
		4	
D 4 Predictability and Control in Budget Execution	5. Real property tax accomplishment rate 6. Effectiveness of tax enhancement measures 7. Predictability in the availability of cash for commitment of expenditures 8. Value for money & controls in procurement 9. Effectiveness of payroll controls 10. Effectiveness of internal control for non-Personal Services expenditures	4	3.00
		1.50	
		2.50	
		0	
		3	
D5 Accounting, Recording and Reporting	11. Timeliness and regularity of accounts reconciliation 12. Timeliness of reconciliation and liquidation of cash advance 13. Quality and timeliness of regular financial reports and annual financial statements	2	3.00
		4	
		4	
D6 Internal and External Audit	17. Effectiveness of internal audit 18. Follow-up on external audit	1	1.00
		1	
D7 Citizen Participation	19. Civil society organization accreditation by the local sangguniangpanlalawigan 20. Degree of citizen’s participation in the budget process	4	4.00
		4	
Overall Average Score (based on average of 7 Dimension)			2.92
Average Score( based on average of 20 indicators			2.77
Average Score (based on average of 39 indicators and sub indicators)			2.44

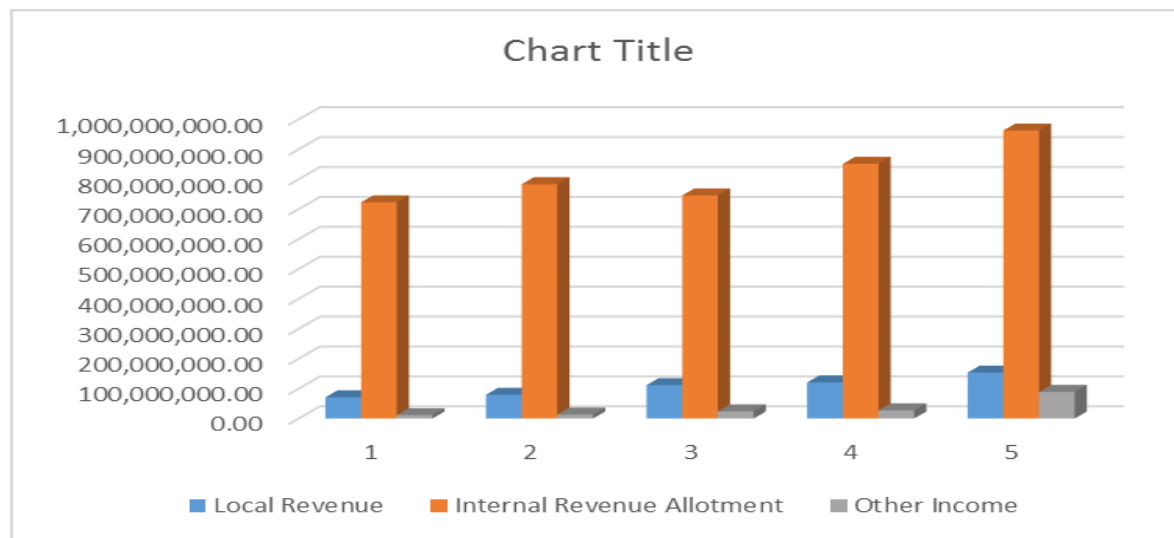
**9.2.1 Income Patterns**

For the last five (5) years 2010-2014, income of the province has been increasing at 8.0% annually. Average yearly income of Php 953,590,720.00 was computed. Please refer to Table No. below.

*Table No. 4-3. Comparative Annual Income by Fund Source  
Davao del Norte, 2010 - 2014*

Revenue Sources	2010	2011	2012	2013	2014
Local Revenue	71,274,303.00	79,553,584.00	111,584,320.05	120,689,332.90	153,619,990.32
Internal Revenue Allotment	722,839,723.00	783,140,097.00	745,735,663.00	851,540,603.00	962,674,924.00
Other Income	11,340,360.00	13,345,280.00	23,896,053.18	27,531,761.22	89,187,606.95
<b>TOTAL</b>	<b>805,454,386.00</b>	<b>876,038,961.000</b>	<b>881,216,036.23</b>	<b>999,761,697.12</b>	<b>1,205,482,521.27</b>

Source: Provincial Accountant’s Office, Davao del Norte; Annual Reports (PPDO)



Local revenues are derived from either the general fund or the Special Education Fund. The general fund covers real property taxes, business taxes, fees and charges, income from economic enterprise ( Davao del Norte hospitals/blood bank,etc) and other receipts; while other income includes receipts from grants, donations and share from PAGCOR/PCSO.

The increase in the local revenues from CY 2012 was brought about by the implementation of the Revised Revenue Code of Davao del Norte and the economic enterprise operation of the three(3) hospitals and blood bank of the province. Permits and licenses were derived mostly from the extraction of sand and gravel and quarry permits. Establishment of check points for the sand and gravel contributed to the increase of the realized income. Please refer to Table No. 3-344, below.

**Table No. 4-4. Local Revenue Sources**  
Davao del Norte, 2010 – 2014

Local Revenue Sources	2010	2011	2012	2013	2014
Local Taxes	42,249,361.00	46,685,514	50,271,373.00	56,289,187.00	68,543,398.00
Permits and Licenses	95,400.00	87,200.00	404,673.00	530,568.00	494,505.00
Service Income	12,793,588	12,724,548.00	30,100,207.00	46,750,736.00	60,875,857.00
Business Income	16,135,953	12,371,653.00	21,814,866.00	17,118,840.00	23,706,229.00
<b>Total</b>	<b>71,274,303.00</b>	<b>79,553,584.00</b>	<b>111,584,320.00</b>	<b>120,689,332.00</b>	<b>153,619,990.00</b>

Source: Provincial Accountant's Office, Davao del Norte; Annual Reports (PPDO)

The province is highly dependent on the Internal Revenue Allotment. With the increase of the local revenues from CY 2012 to 2014, IRA dependency has decreased up to 79% in 2014.

**Table No. 4-5. Internal Revenue Allotment Share to Annual Income**  
Davao del Norte, 2010 - 2014

	2010	2011	2012	2013	2014
Total Income	805,454,386.00	876,038,961.000	881,216,036.23	999,761,697.12	1,205,482,521.27
IRA	722,839,723.00	783,140,097.00	745,735,663.00	851,540,603.00	962,674,924.00
IRA % Share	89%	89%	84%	85%	79%

Source: Provincial Accountant's Office, Davao del Norte; Annual Reports (PPDO)

### Loans and Borrowings

To fast track the implementation of priority programs and projects, loans and borrowings were made from CY 2010 to CY 2014. Majority of the loaned amount funded the construction of the Davao del Norte Sports and Tourism Center including the renovation of the Gymnasium. Please refer to the schedule of borrowings and its amortization in Table No. below.

**Table No. 4-6. Loans and Borrowings**  
Davao del Norte, 2010 - 2014

	2010	2011	2012	2013	2014
Loans/Borrowings	170,247,764.00	21,545,250.00	32,613,805.00	297,324,324.00	4,176,028.00
Loan Amortization	58,155,395.00	66,394,801.00	68,495,632.00	71,536,237.00	92,149,837.00

### 9.2.2 Expenditure Patterns

Expenditure pattern covers the assessment of the total spending inclusive of capital outlays for both the general and special education fund. In terms of classification, the Maintenance and Other Operating Expenses (MOOE) has the biggest share over the past five (5) years.

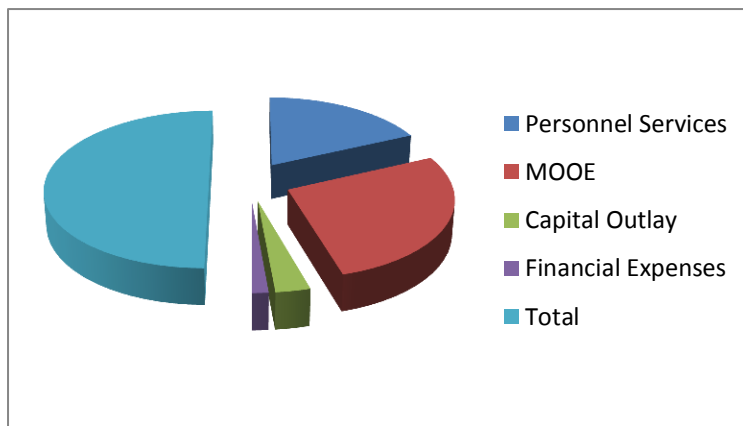
Table No. 3-347 below.

**Table No. 4-7. Expenditures By Classification**  
Davao del Norte, 2010 – 2014

Year	Personnel Services	%	MOOE	%	Capital Outlay	%	Financial Expenses	%	TOTAL
2010	301,732,039.00	37	465,857,767.00	57	18,618,050.00	2	25,150,320.00	3	811,358,177.00
2011	325,279,079.00	35	520,504,043.00	56	51,238,028.00	5	28,786,686.00	3	925,807,837.00
2012	345,111,931.00	36	467,116,391.00	49	106,324,605.00	11	23,738,128.00	2	942,291,056.00
2013	375,135,977.00	38	539,643,786.00	55	30,468,574.00	3	28,987,428.00	2	974,235,766.00
2014	384,311,093.00	34	615,357,342.00	55	84,513,130.00	7	28,777,087.00	2	1,112,958,654.00
Ave.	346,314,023.00	36	521,695,865.00	54	58,232,477.00	6	27,087,929.00	2	953,330,298.00

Source: PBO, Davao del Norte (SAOB –Gen. Fund & SEF)

**Figure No 42. Expenditure by Classification**  
Davao del Norte, 2010 - 2015



For the last five (5) years, the General Public Services have the biggest share of the provincial budget followed by the Economic Sector then the Economic Enterprise Sector.

**Table No. 4-8. Expenditure by Sector**  
Davao del Norte, 2010 – 2014

	2010	2011	2012	2013	2014	Average
Gen Public Services	394,438,241.00	417,113,444.00	430,418,022.00	491,709,697.00	569,075,395.00	460,550,959.00
Health Services	122,166,945.00	134,066,995.00	53,989,484.00	38,402,500.00	68,234,234.00	83,372,031.00
Education, Culture, Sports & Manpower Devt	1,150,000.00	9,080,000.00	9,462,000.00	10,212,000.00	20,364,275.00	10,053,655.00
Social Welfare Services	17,558,432.00	14,657,602.00	27,479,622.00	27,326,579.00	28,792,835.00	23,163,014.00
Economic Services	47,316,896.00	164,146,554.00	169,387,034.00	187,359,762.00	202,963,738.00	154,234,796.00

Other Purpose	37,933,722.00	47,045,505.00	46,319,884.00	63,621,517.00	65,330,000.00	52,050,125.00
Economic Enterprise	114,010,748.00	-	84,821,617.00	144,865,708.00	153,439,523.00	99,427,519.00
TOTAL	734,574,984.00	786,110,100.00	821,877,663.00	963,497,763.00	1,108,200,000.00	882,852,102.00

Source: PBO- Annual Budget, Davao del Norte

### 9.3 Disaster Risk Reduction and Management

Natural disasters can have important implications for public finance. Disasters are likely to result in additional expenditure with implications for investment and other expenditures. Public revenue may decline as levels of economic activity may fall.

Davao del Norte is not spared of the natural disasters experienced in the country, in fact during typhoon “Pablo” in 2012, Storm Signal No. 3 was experienced in the area. Disaster caused by nature and induced by human actions may occur at any time. It undermines progress, impoverishes communities and impedes realization of development.

In times of calamities, people are confronted with situation which made them helpless and unable to evade the destructive effects of the phenomena. It is on this premise that aside from nurturing development interventions as highly people-centered and dynamic, the Provincial Government of Davao del Norte needs to build a system to protect its constituency and their primary source of economic stability.

Annually, five (5) percent of the Budget has been allotted to disaster preparedness undertakings. Utilization of this fund is in accordance to the provisions of Republic Act No. 10121 or the Philippine Disaster Risk Reduction and Management Act of 2010 and Joint Circular No. 01 Series of 2013 of the Department of the Interior and Local Government (DILG), Department of Budget and Management (DBM) and the National Disaster Risk Reduction and Management Council (NDRRMC). Commission on Audit (COA) Circular issued in 2012 also guided the utilization of LDRRM Fund by the LGUs. The seventy percent (70%) of the LDRRMF is allocated for the prevention and mitigation phase, preparedness, response and rehabilitation and recovery. While the thirty percent (30%) is allocated as Quick Response Fund in lump sum amount and can only be used when there is declaration of State of Calamity.

The unexpended balances of the LDRRM Fund shall accrue to a special trust fund solely for the purpose of supporting disaster risk reduction and management within the next five (5) years.

Table below shows the budget allocation for the Local Disaster Risk Reduction and Management Fund(LDRRMF) of the province.

Table No. 4-9. **LDRRM Fund**, Davao del Norte, 2010 – 2014

Year	Appropriation	Increase/Decrease	Percentage
2010	38,984,082.00		
2011	42,325,856.00	3,341,774.00	8.57
2012	41,398,946.00	(926,910.00)	(2.19)
2013	48,215,489.00	6,816,543.00	16.47
2014	57,729,317.00	9,513,828.00	19.73

In line with the national framework, priorities in disaster preparedness are categorized under the identified four (4) thematic areas, to wit:

The priority area on **Disaster Prevention and Mitigation** provides key strategic actions that give importance to activities revolving around hazards evaluation and mitigation, vulnerability analyses, identification of hazard-prone areas and mainstreaming DRRM into development plans. It is based on sound and scientific analysis of the different underlying factors which contribute to the vulnerability of the people and eventually, their risks and exposure to hazards and disasters.

**Disaster Preparedness** provides for the key strategic actions that give importance to activities revolving around community awareness and understanding; contingency planning; conduct of local drills and the development of a national disaster response plan. Risk-related information coming from the prevention and mitigation aspect is necessary in order for the preparedness activities to be responsive to the needs of the people and situation on the ground. Also, the policies, budget and institutional mechanisms established under the prevention and mitigation priority area will be further enhanced through capacity building activities, development of coordination mechanisms. Through these, coordination, complementation and interoperability of work in DRRM operations and essential services will be ensured. Behavioral change created by the preparedness aspect is eventually measured by how well people responded to the disasters. At the frontlines of preparedness are the local government units, local chief executives and communities.

**Disaster Response** gives importance to activities during the actual disaster response operations from needs assessment to search and rescue to relief operations to early recovery activities are emphasized. The success and realization of this priority area rely heavily on the completion of the activities under both the prevention and mitigation and preparedness aspects, including among others the coordination and communication mechanisms to be developed. On-the-ground partnerships and the vertical and horizontal coordination work between and among key stakeholders will contribute to successful disaster response operations and its smooth transition towards early and long term recovery work.

The **Rehabilitation and Recovery** priority area covers employment and livelihoods, infrastructure and lifeline facilities, housing and resettlement, among others. These are recovery efforts done when people are already outside of the evacuation centers.



Disaster preparedness is a vital component in local governance. Structures and mechanisms are in place but need further enhancement. A disaster operation center has been established with staff complementation coming from other offices.

Early warning systems are in place to include automatic weather stations, rain gauges, water level monitoring devices which are installed in strategic areas. A monitoring room is established at the Operation Center which gives regular updates of the installed warning devices.

Incident Command System is readily activated during emergencies. Volunteers and other stakeholders ably supported the rescue and other emergency operations.

#### **9.4 Gender and Development**

Gender and development is a major area for improvement. In Davao del Norte, efforts were previously undertaken in mainstreaming gender and development. A ten-year Gender Responsive Comprehensive Development Plan was formulated in 1998. However, gender mainstreaming in the province was apparent only in some projects for its clients. GAD mainstreaming was not sustained specifically in the internal organization. There is an unclear structure for GAD mainstreaming and the institution lacks internal systematic mechanisms and processes in addressing gender-specific issues in offices, programs, projects and activities. Likewise, outputs and outcomes are not yet evident.

In partnership with the Australian Agency for International Development (AusAID) in 2011, various interventions were implemented including the establishment of the Gender and Development Program and the activation of the GAD focal persons in all departments. Capacity development activities were undertaken including adopting gender and development as a strategy. The Provincial GAD Focal Point System was established through Executive Order No. 21, S. 2014 as the main mechanism to catalyze and accelerate gender mainstreaming within the agency.

The Executive and Legislative Agenda (ELA) formulated in 2013 has articulated its commitment to a “gender responsive governance” and pursue gender mainstreaming as a strategy to implement and localize the Magna Carta for Women.

The provincial government endeavors to ensure that gender and development is mainstreamed in local policy-making and planning development processes in order to attain equal opportunities among Davaonons.

#### **DEVELOPMENT ISSUES AND CHALLENGES**

- **LDRRMOs not yet fully institutionalized pursuant to RA 10121 and JMC No. 01, S2014.**  
At the provincial level, a unit under the Office of the Governor has been created but only the item of a Division Head was funded. Staff complement of the Provincial Operation Center is augmented by detailed personnel from other offices. Most of the responders are having job-order status of employment.

At the city and municipal levels, most of the LDRRMOs are having multiple functions.

- **High dependency on IRA.** IRA dependency has been decreasing from 89% in 2010 to 79% in 2014, but still the percentage is high. Tax remedies on delinquent RPT are not fully implemented.
- **Public Economic Enterprises are highly subsidized.** Revenue generated from the Provincial Economic Enterprise is not sufficient to address the budgetary requirement. During the last three (3) years operation, subsidy to the economic enterprise operation was computed at 60%.
- **Effectiveness of the internal audit needs improvement.** In the Public Financial Management Tool Assessment designed by DBM, the indicator on internal audit got the lowest rating of 1 in 2013.
- **Lack of capacities on CCA and DRR particularly community level risk assessments; community-based disaster risk reduction and management; contingency planning; CCA/DRR database and inventories; CCA/DRR policies and early warning systems.** Pursuant to the self-assessment tools on RA 9729 and RA 10121, the items mentioned earlier got lower ratings in 2013.
- **Gender and Development not yet fully mainstreamed in local governance.** GAD not yet evident in the output and outcomes of PPAs.

## GOALS

1. Strengthened Organizational Development
2. Improved Public Financial Management
3. Safe, adaptive and risk resilient communities
5. A gender responsive local governance

## OBJECTIVES

1. To fully institutionalize the PDRRMO (pursuant to RA 10121 and JMC No.1, S. 2014) by 2016
2. Full implementation of the Provincial HRD/HRIS Plans in 2016
3. To increase local revenues by 10% annually starting 2015.
4. To achieve financial stability of the local economic enterprises by 2020
5. To operationalize internal audit services by 2015.
6. To promote participation, transparency and accountability in local governance
7. To strengthen capacities of the institution and communities to anticipate, cope and recover from the negative impacts of emergency occurrences and disasters by 2020
8. To fully integrate and mainstream gender and development in all programs, projects and activities by 2020.

## **STRATEGIES**

1. *Provincial partial re-organization in 2015*
2. *E-governance implementation*
3. *Strengthening the competency of the workforce*
4. *Strengthening the implementation of e-tracs, tax remedial and other tax enforcement measures.*
5. *Strengthening of resource mobilization and partnerships*
6. *Institutionalization of audit services and controls.*
7. *Adherence to Full Disclosure Policy and ARTA Law*
8. *Promote private sector participation in local governance.*
9. *Conduct of capacity buildings, learning and development programs/activities.*
10. *Community-based disaster risk reduction and management*
11. *Policy development/enforcement*
12. *Improvement of the CCA/DRR monitoring and early warning systems*
13. *Implementation of the Provincial GAD Code*
14. *Sustainable GAD Program/Activities*

## **PROGRAM, PROJECTS AND ACTIVITIES**

### **I. GOVERNANCE SECTOR**

#### **a. Peace and Order Program**

- Anti-Crime and Government Integration Project
- Probationeers, Parolees and Pardonees Rehab. Project
- Construction of Half-way house for former rebels
- Comprehensive Legal Assistance Project

#### **b. Human Capital Enhancement Program**

- Socio-cultural Project
- Management Support Services Project
- Gender and Development Project
- Women Livelihood and Empowerment Project
- Continuing Studies for Local Development Project

#### **c. Human Resource Development Program**

- Executive & Legislative Enhancement Program
- Middle Manager's Development Project
- Employee's Competency Enhancement Project
- Implementation of Performance Management System Project
- PGDdN HRD Core Team and Pool of Trainers
- Employees and Retirees Health and Welfare Project
- Rewards and Recognition Project

#### **d. E-Governance Program**

- IS Development and Maintenance Project

- Hardware and Network Development Project
  
- e. Knowledge Management Development Program**
  - Planning and Development Programming Project
  - Geographic Information System (GIS) Development Project
  
- f. Government facilities Upgrading Program**
  - Upgrading of Various Government Buildings/Facilities
  - Prov'l. Gov't. Center Ground Dev't. Project
  - Beautification of Capitol Park and Plaza
  - MRF, Nursery and Waste Material Depot Project
  - Construction of SP Building Project
  
- g. Financial Resources Management and Development Program**
  - Asset Acquisition and Property Management Project
  - Resource Allocation and Appropriation Project
  - Financial Resources Mgt. Policy and Expenditure Control
  - Internal Control and Quality Standard Management Project
  
- h. Public Fiscal Management Program**
  - Revenue Collection Enhancement Project
  - RPTA Development Project
  - Comprehensive Tax Mapping Project
  
- i. Legislative Program**
  - Legislative Research Project
  - Upgrading of SP Session Hall Sound System Project
  - Upgrading of Records and Archives Center
  
- j. Debt Servicing/Loan Amortization Program**



CHAPTER V

# Monitoring and Evaluation



## **MONITORING AND EVALUATION**

Monitoring and evaluation (M&E) is built into the Executive and Legislative Agenda, whose focus is on the plan implementation. This section outlines the monitoring and evaluation system of the updated PDPFP.

The objectives of M&E are:

1. To enable the province to assess the progress of the PDPFP, vis-à-vis, its targets, objectives and goals, with an established and operationalized systems and structures;
2. To utilize the PDPFP achievements not only for reporting to other project stakeholders but also for understanding the factors that influence performance and for using the lessons learned in future planning and programming; and
3. To promote the culture of performance among project implementers and stakeholders as part of the effort to introduce institutional reforms and innovations in the provincial government.

### **Monitoring and Evaluation System for CCA and DRRM**

M&E will look into PDPFP's accomplishments in relation to its contribution in the achievement of the goals of enhanced economic, environment, social and governance conditions of the province-in pursuance of the Vision of the province.

There shall be templates to develop for the M & E system to ensure the performances of the Provincial Government's efforts in achieving its Vision by gauging the results and outcomes of the various programs, projects and activities implemented. The template shall contain the following information.

1. Clear results expected at the output, outcomes and impact levels.
2. Defined performance indicators to measure achievement of the results
3. Quantified targets relating to the indicators to gauge successes
4. Source of information and documents where the performances are recorded and/or reported
5. The system or procedure how the reports/s will be accessed
6. The frequency of accessing the needed reports and information
7. The office or agency responsible in sourcing the reports and information needed

To comprehensively measure the progress of the implementation of the DRR/CCA PDPFP, the measurement framework templates shall be developed extensively with the participation of all provincial government's department. As each department has their own mandate to address, the composition will ensure their ownership of the M&E



system. Each department by then, will be able to relate to the contents and outcomes of the measurements being done.

Monitoring and Evaluation Performance Measurement Template  
Enhanced PDPFP Integrating DRR/CCA  
Province of Davao del Norte

Results	Performance Indicator	Targets/ Indicator	Data Source	Collection Methods	Frequency	Responsibility Center
Sector/Sub-sector						
Goal/Impact (Long term)						
Objective (Medium term)						
Program or Project Outcomes						
Outputs/Deliverables (Short term)						
Activities (On-going)						

### **MONITORING AND EVALUATION MECHANISM**

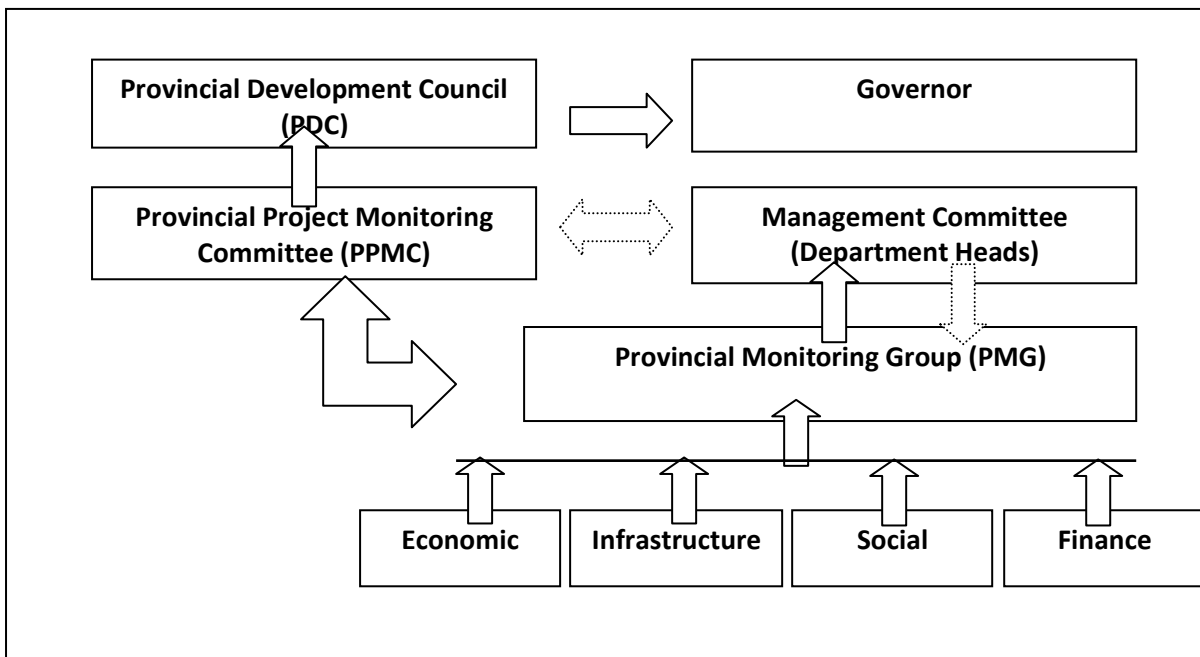
The monitoring and evaluation system shall make use of the existing Provincial Project Monitoring Committee (PMC). Monitoring and evaluation will continue to be the responsibility of the PPMC, with the technical support of the PPDO as the Secretariat. To assist PPMC attain its function, a Provincial Monitoring Group (PMG) shall be constituted through an Executive Order. PMG is a grouping of sectors composed of the representatives from various departments of the Provincial Governments; the economic, social, infrastructure and finance sectors.

The PMG shall facilitate the field level monitoring in agreement with the PPMC. Monitoring templates shall be developed to capture needed information and data at the input and output levels. The PPDO, being the Secretariat of PPMC, shall consolidate the results of field monitoring conducted by PMG. Concerned departments will be provided with the results of the monitoring, as submitted to the PPMC. The PPMC will assess the status, identify and address areas for improvement, and communicate early gains and

lessons learned. Monitoring and evaluation reports shall be submitted regularly to the Provincial Development Council which is chaired by the Provincial Governor.

The structure is illustrated in Figure 43. The M&E system should also be adopted by the Provincial Development Council.

**Figure 43. Provincial M&E Structure, Davao del Norte**



The Provincial Project Monitoring Committee is composed of representatives from NGO/CSO members of the Provincial Development Council and concurrently chaired by the DILG Provincial Director. The PPMC will report their monitoring and evaluation findings and assessment to the PDC. The PPMC functions relative to PDPFP M&E are as follows:

1. Monitor and evaluate the execution and implementation of all foreign and nationally-funded projects, including development projects funded by the IRA share of the LGU or supported by funds released directly to the Province and projects funded from locally generated resources implemented within the province.
2. Provide a forum for the regular accounting of progress and accomplishment reports of the project implementers as often deemed necessary.

3. Identify problems in the course of project implementation and recommend solutions for review of the PDC.
4. Assist in the swift resolution of issues affecting the implementation of projects within its area of jurisdiction.
5. Gather feedback on remedial actions and warrant their implementation.
6. Ensure the dissemination of periodic monitoring reports.

The Provincial Project Monitoring Group shall be composed of the representatives from the provincial office/department in the sector of economic, social, infrastructure and finance. The PMG shall report to the Management Committee composed of Department Heads from road-related offices/departments and the PPMC. The PMG shall have but not limited to the following functions:

1. Coordinates with PPDO M&E Division and concerned departments in accessing detailed reports of PPAs implementation using a uniform and approved format.
2. Assist the PPMC in the conduct of field monitoring to validate/assess projects progresses and statuses.
3. Transmits to PPMC Secretariat the reports and recommendations as results of the monitoring activities.

The Monitoring and Evaluation Division of the PPDO shall serve as the Secretariat of the PPMC. The Secretariat will perform the following functions:

1. Review and consolidate PMG monitoring reports.
2. Submit consolidated PMG monitoring reports to PPMC, copy furnished concerned implementing offices.
3. Gather, collate, and furnish the PDC and the Regional Project Monitoring Committee the complied report of the project implementers.
4. Arrange and coordinate meetings of the PMC and record proceedings and discussion thereat.
5. Prepare the monitoring program to be undertaken by the PPMC and PMG.

### **Data Collection System**

Data will be collected through existing and suggested collection and reporting mechanisms. Some of which are:

- Community Based Monitoring Systems (CBMS)
- Community Impact Monitoring and Evaluation Surveys (CIMES)
- PLGU Monitoring Reports such as financial reports, annual agency reports, sectoral report on agriculture, health, education, housing and other sectors; business registry, land assessment, among others.
- Local Government Performance Management System (LGPMS)
- System for Competency Assessment of Local Government (SCALOG) indicators
- Strategic Performance Measurement System (SPMS)
- Regional Project Monitoring and Evaluation Systems (RPMES) indicators.

For data needs that are not covered with the existing data collection systems or when the frequency data collection does not fall in time when the data is needed, the province will either expand a data collection mechanism related to the data needed and/or engage a service provider/s to devise data collection tool.

Baseline data collection will be initiated once the M&E Framework has been approved.

### **Data Management**

The Provincial Planning and Development Office will manage PDPFP-related data and information-ensuring the security, availability, and accessibility of digital (soft) and hard data and reports. The office will also explore the establishment of a data-based management system to ensure efficiency in data gathering, processing, analyzing and reporting.

### **Reports and Feedback Mechanisms**

PDPFP accomplishment reports and performance analysis will be reported and shared to partners and implementers on a regular basis as part of the feedback and knowledge management processes of the PLGU. Among the key reports that will be produced are:

- Provincial Annual Report- the annual report will include information related to PDPFP's progress and achievement towards the outputs, outcomes and impacts.

The annual accomplishment and assessment reports will be used by the provincial decision-makers for management actions on the improvements in the PDPFP processes and for policy making. The reports will be packaged to form part of the annual report to the public for transparency and for encouraging community participation and involvement in PDPFP implementation.

- Quarterly Report- the quarterly report will cover the achievements and progress assessment of PDPFP's/PDIP/AIP physical and financial outputs.

The quarterly report will be prepared as part of the regular management tool in deciding PDPFP improvements and adjustments. This report will also be submitted to the PDC, especially to its Infrastructure Committee.

- Activity Report- will include the information on the activities accomplished and the assessment of progress towards the achievement of targeted activities and inputs. This will be accomplished on a monthly basis with inputs from the appropriate office and municipalities concerned.

The activity report will be prepared by the appropriate unit to serve as a tool in decision making in relation to tracking targets, adjusting resources, focusing of support, defining specific capacity building requirements and other related activities.

**M&E Schedules**

Results Level	Monitoring Frequency	Evaluation Frequency
Impact	Annual Data Gathering	Every three years assessment of results
Outcomes	Annual data gathering and integration results	Annual assessment of progress towards outcome
Output	Monthly data gathering and quarterly consolidation	Quarterly evaluation of progress
Input	Monthly and per activity data gathering and monitoring	Monthly evaluation of activities and inputs

**LGU Mandates under the Climate Change Act (RA 9729)**

<b>Mandates for Provincial LGUs</b>	<b>Briefly describe the actions taken or being undertaken with regards to the mandate</b>	<b>Compliance Rating</b>
1. Provide technical assistance, enforcement and information management in support of municipal and city climate change action plans.	Assisted municipalities in the integration of climate change adaptation activities in the DRRM plan	4
2. Conduct Inter-local government unit collaboration in the conduct of climate-related activities.	Facilitated Climate Change Adaptation Input to the Provincial Government employees last July 22, 2013 where resource person was from Climate Change Manila Observatory Office	5
3. Allocate from their annual appropriations adequate funds for the formulation, development and implementation, including training, capacity building and direct intervention, of their respective climate change programs and plans.	Allocation of funds for climate change programs and plans are incorporated in the DRRM activities and plans	5
4. Conduct public awareness campaigns on the effects of climate change and energy-saving solutions to mitigate these effects, and initiatives, through educational and training programs and micro-credit schemes, especially for women in rural areas.	Climate change adaptation campaign is the focus of the OPLAN ANDAM, a disaster preparedness and CCA activity at the flood prone barangays of Davao del Norte	4

Rating: 5 – Fully met; 4 – Moderately met; 3 – Fairly met; 2 – Poorly met; and 1 – Not yet met

**LGU Mandates under the Disaster Risk Reduction and Management Act (RA 10121)**

<b>Mandates for Provincial LGUs</b>	<b>Briefly describe the actions taken or being undertaken with regards to the mandate</b>	<b>Compliance Rating</b>
1. Established an LDRRMO which shall be responsible for setting the direction, development, implementation and coordination of disaster risk management programs	All 11 municipalities/ cities of Davao del Norte have organized C/MDRRM Councils by virtue of Executive Order	4
2. Organize, train and directly supervise the local emergency response teams	All of the LGUs have organized and trained local responders or emergency teams	4
3. Design, program, and coordinate disaster risk reduction and management activities consistent with the National Council's standards and guidelines	Followed the 4 phases of disaster intervention in making plans	5
4. Facilitate and support risk assessments and contingency planning activities at the local level	To be undertaken	4
5. Consolidate local disaster risk information which includes natural hazards, vulnerabilities, and climate change risks, and maintain a local risk map	On-going activity	5



6. Organize and conduct training, orientation, and knowledge management activities on disaster risk reduction and management at the local level	Conducting <b>Oplan ANDAM</b> in 64 barangays (for CY 2014) and DRRM-CCA training and orientation at the 26 schools, rescue groups, & church workers	4
7. Operate a multi-hazard early warning system, linked to disaster risk reduction to provide accurate and timely advice <b>to national or local emergency response organizations and to the general public</b> , through diverse mass media, particularly radio, landline communications, and technologies for <b>communication within rural communities</b>	Assisted the DOST in the installation of Automatic Rain Gauges and Water Level Monitoring Sensor at the 6 municipalities and Automatic Weather Station at the PDRRMC Operation Center. Established forms of communications; radio and landline communications to inform LGUs and general public on weather forecasts and warning.	4
8. Formulate and implement a comprehensive and -integrated LDRRMP in accordance with the national, regional and provincial framework, and policies on disaster risk reduction in close coordination with the local development councils (LDCs)	All LDRRMOs produced yearly LDRRM Plan thru their MDRRM Councils	4
9. Prepare and submit to the local Sanggunian through the LDRRMC and the LDC the annual LDRRMO Plan and budget, the proposed programming of the LDRRMF, other dedicated disaster risk reduction and management resources, and other regular funding <i>source/s</i> and budgetary support of the <i>LDRRMO /BDRRMC</i>	Prepared yearly budget based on the 5% allocation for LDRRMF for the specific program and project and submitted to the Sanggunian for approval	5
10. Conduct continuous disaster monitoring and mobilize instrumentalities and entities of the LGUs, CSOs, private groups and organized volunteers, to utilize their facilities and resources for the protection and preservation of life and properties during emergencies in accordance with existing policies and procedures	LDRRMOs are invited to attend the periodic meeting and so the CSOs who are members of the PDRRM Council to participate and share their available resources during emergencies like flooding & landslide	4
11. Identify, assess and manage the hazards, vulnerabilities and risks that may occur in their locality	DRA/CCA activities are still ongoing	4
12. Disseminate information and raise public awareness about those hazards, vulnerabilities and risks, their nature, <b>effects, early warning signs and counter-measures</b>	Established communication line to the LDRRMOs for fast and reliable information dissemination regarding weather updates and warning	5
13. Identify and implement cost-effective risk reduction <b>measures/strategies;</b>	Identified strategies are incorporated in ELA	5
14. Maintain a database of human resource, equipment, directories, and location of critical infrastructures and their capacities such as hospitals and evacuation centers	PDRRMC requested list of responders of from municipalities/cities, with list of available rescue equipment & directories at the Information Office and concerned offices	4
15. Develop, strengthen and operationalize mechanisms for partnership or networking with the private sector, CSOs, and volunteer groups	NGOs, CSOs, telephone companies, religious groups and private sectors are part of the PDRRMC structure as	4

	members of the different committees	
16. Take all necessary steps on a continuing basis to maintain, provide, or arrange the provision of, or to otherwise make available, suitably-trained and competent personnel for effective civil defense and disaster risk reduction and <b>management in its area</b>	Skills training on rescue and seminar related to DRRM –CCA is regularly schedule for the organic staff of PDRRM, network, government agencies, schools & barangay functionaries	4
17. Organize, train, equip and supervise the local emergency response teams and the ACDVs ensuring that humanitarian aid workers are equipped with basic skills to assist mothers to breastfeed	Facilitated monthly training for barangay functionaries and responders such water rescue, rescue rope, basic life -saving & others.	3
18. Prepare and submit, through the LDRRMC and the LDC, the report on the utilization of the LDRRMF and other dedicated disaster risk reduction and management resources to the local Commission on Audit (COA), copy furnished the regional director of the OCD and the Local Government Operations Officer of the DILG	The 4 committees are required to submit activity and financial report to the PDRRM Council wherein DILG is a member and OCD Regional Director is invited	4
19. Respond to and manage the adverse effects of emergencies and carry out recovery activities in the affected area, ensuring that there is an efficient mechanism for immediate delivery of food, shelter and medical supplies for women and children, endeavour to create a special place where internally-displaced mothers can find help with breastfeeding, feed and care for their babies and give support to each other	This emergency management is stipulated in the Response Protocol of the PSWDO as the focal of the Response Committee	4
Within its area, promote and raise public awareness of and compliance with the DRRM Act and legislative provisions relevant to the purpose of this Act	RA 10121 is the opening topic of every DRRM orientation or seminar in the barangay and other group	4
Serve as the secretariat and executive arm of the LDRRMC	The P/C/MDRRM Division act as secretariat of the P/C/MDRRMC	4
Coordinate other disaster risk reduction and <b>management activities</b>	Our Division is working in coordination with schools, government agencies, LGUs, and private sector and CSOs in implementing related activities	4
Establish linkage/network with other LGUs for disaster risk reduction and emergency response purposes	Established linkage with water district, telephone/communication companies, private establishments and local responders groups	4
Recommend through the LDRRMC the enactment of local ordinances consistent with the requirements of this Act	We supported enactment of the Local Security Code of Davao del Norte	4
Implement policies, approved plans and programs of the LDRRMC consistent with the policies and guidelines laid down in this Act	Supported the finalization of the MDRRMC plan of different LDRRMOs	4
Establish a Provincial Disaster Risk Reduction and Management Operations Center	Out of 11 LGUs, 8 of the municipalities and 1 City has functional Operation Center. Davao del Norte had established its OpCen in 2012	4



## Annexes

