

JAPAN INTERNATIONAL COOPERATION AGENCY

DEPARTMENT OF THE INTERIOR AND LOCAL GOVERNMENT  
THE REPUBLIC OF THE PHILIPPINES

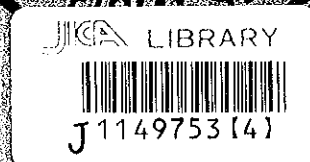
THE STUDY ON THE  
PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
IN  
THE REPUBLIC OF THE PHILIPPINES

VOLUME I - [2]

MAIN REPORT

PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN  
FOR THE PROVINCE OF

DAVAO DEL NORTE

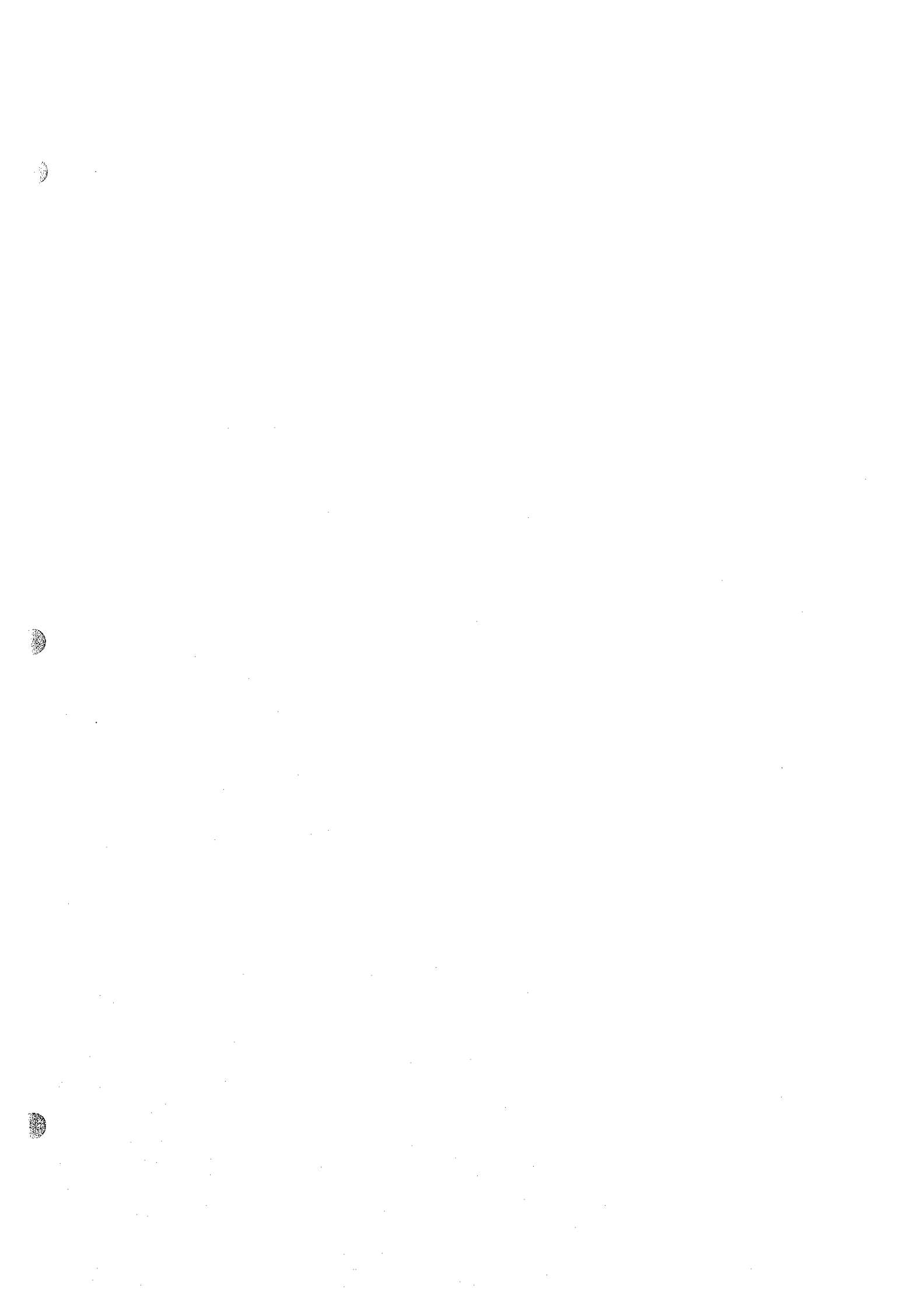


MARCH 1999

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**MARCH 1999**

**NIPPON JOGESUIDO SEKKEI CO., LTD.**



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Republic of the Philippines  
PROVINCE OF DAVAO DEL NORTE  
OFFICE OF THE PROVINCIAL GOVERNOR



## MESSAGE

*Water begets life. Without it, human being nor living thing could ever thrive in this Planet. Ecological balance and sustainable development can never be realized when there is an acute water shortage. Today, more than ever, there is a threat to our water resources - the depletion of our watersheds. Davao del Norte is not spared of this danger, neither Tagum City with its numerous wells which were found to contain brackish or salinic water, nor the Island Garden City of Samal as tourist spot, which is also vulnerable to water pollution.*

*Nevertheless, given this scenario, and considering the importance of water as a vital element of life amidst burgeoning population and rapid growth of industrialization, I believe that there is more reason for LGUs to give due emphasis on proper and efficient utilization of available water resources. Hence, water conservation measures through effective law enforcement have to be seriously undertaken in every local government unit. This calls for concerted action by all constituents to sustain adequate water supply and sanitation for a decent and healthy existence.*

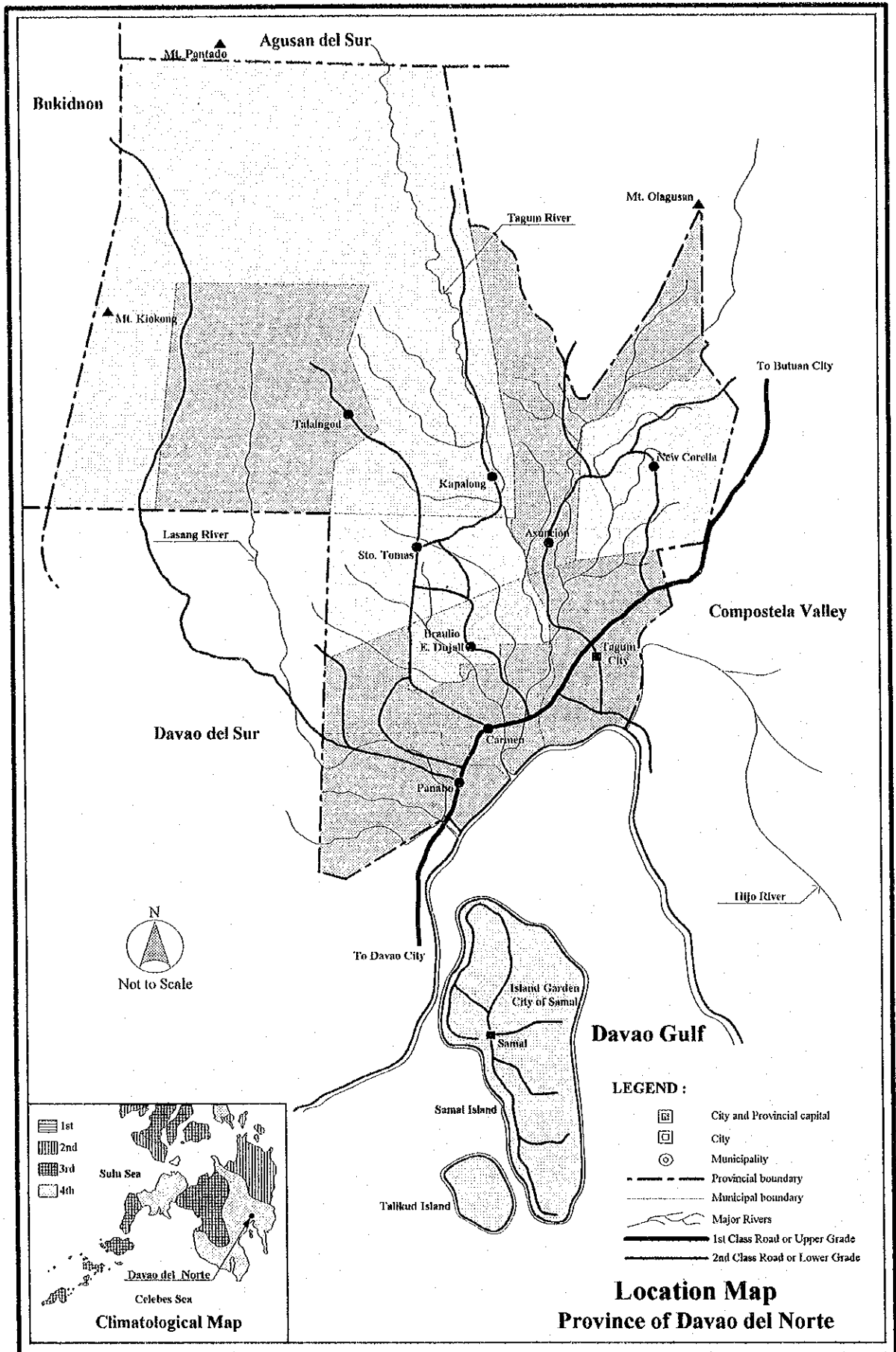
*May I therefore take this opportunity to thank JICA and DILG Study Team for having afforded Davao del Norte the chance to avail of its technical expertise and capability - building efforts. Its valuable assistance to the Province, ably represented by the Provincial Sector Planning Team composed of the PPDO, PHO, PEO, PGO, PCDO and DILG would go a long way in the formulation of the Provincial Water Supply, Sewerage and Sanitation Sector Plan for comprehensive sector development through the future.*

*I look forward with optimism that, even the meager resources this province is experiencing, the efforts of Study Team and PSPT will not be in vain, since the plan has been envisioned primarily to deliver the most basic need of our constituent - safe potable water, in line with our government's medium and long term plan. Somehow, the realization of the plan will be contributory to the improvement of environmental protection, sustained environmental management, effective planning parameters and relentless involvement in development processes on the Province of Davao del Norte.*

*Godspeed and MABUHAY!*

A handwritten signature in black ink, appearing to read 'Rodolfo P. Del Rosario'. The signature is stylized and cursive.

**RODOLFO P. DEL ROSARIO**  
Governor





**PROVINCIAL WATER SUPPLY, SEWERAGE AND  
SANITATION SECTOR PLAN**

**VOLUME I MAIN REPORT**

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# PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

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# PROVINCIAL WATER SUPPLY, SEWERAGE AND SANITATION SECTOR PLAN

## LIST OF ABBREVIATIONS

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AC-PO	-	Area Coordinator-Project Officer
ADB	-	Asian Development Bank
AIDAB	-	Australian International Development Assistance Bureau
AIM	-	Asian Institute of Management
AIP	-	Annual Investment Plans
BC	-	Barangay Council
BDC	-	Barangay Development Council
BLGF	-	Bureau of Local Government Finance
BMGS	-	Bureau of Mines and Geo-Sciences (defunct), the now Mines and Geo-Sciences Bureau
BOD	-	Biochemical Oxygen Demand
BOD/Officers	-	Board of Director/Officers
BWP	-	Barangay Water Program
BWSA	-	Barangay Waterworks and Sanitation Association
CBO	-	Community-Based Organizations
CD	-	Community Development
CDA	-	Cooperative Development Authority
CDF	-	Countryside Development Fund
CDTS	-	Community Development and Training Specialist
CEP	-	Capacity Enhancement Program
CIDA	-	Canadian International Development Agency
CLGOO	-	City Local Government Operations Officer
CO-CD	-	Community Organization-Community Development
CPC	-	Country Program for Children
CPH	-	Census on Population and Housing
CPSO	-	Central Project Support Office
CSC	-	Civil Service Commission
D/D	-	Detailed Design
DA	-	Department of Agriculture
DAP	-	Development Academy of the Philippines
DBM	-	Department of Budget and Management
DECS	-	Department of Education, Culture and Sports
DENR	-	Department of Environment and Natural Resources
DEO	-	District Engineering Office
DF	-	Development Fund
DILG	-	Department of the Interior and Local Government
DOF	-	Department of Finance
DOH	-	Department of Health
DPWH	-	Department of Public Works and Highways
DSWD	-	Department of Social Welfare and Development
DTI	-	Department of Trade and Industry
EVS	-	Environmental Sanitation
F/S	-	Feasibility Study
FHSIS	-	Field Health Service Information System
FW4SP	-	First Water Supply, Sewerage and Sanitation Sector Project
GAD	-	Gender and Development
GFI	-	Government Financial Institution
GO	-	Government Office
GOP	-	Government of the Philippines

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## List of Abbreviations

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GOJ	-	Government of Japan
HH	-	Household
IBRD	-	International Bank for Reconstruction and Development
IEC	-	Information, Education and Communication
IRA	-	Internal Revenue Allotment
IRR	-	Implementing Rules and Regulations
ITN	-	International Training Network
JICA	-	Japan International Cooperation Agency
LBP	-	Land Bank of the Philippines
LGC	-	Local Government Code
LGU	-	Local Government Unit
LWUA	-	Local Water Utilities Administration
MDC	-	Municipal Development Council
MDF	-	Municipal Development Fund
MEO	-	Municipal Engineer's Office
MHO	-	Municipal Health Office
MLGOO	-	Municipal Local Government Operations Officer
MOA	-	Memorandum of Agreement
MOOE	-	Maintenance Operating and Overhead Expenses
M/P	-	Master Plan
MPDO	-	Municipal Planning and Development Office
MS	-	Monitoring Specialist
MSL	-	Municipal Sector Liaison
MSLT	-	Municipal Sector Liaison Team
MTPDP	-	Medium-Term Philippine Development Plan
MWSS	-	Metropolitan Waterworks and Sewerage System
MWSTF	-	Municipal Water and Sanitation Task Force
NAMRIA	-	National Mapping and Resource Information Authority
NCRFW	-	National Commission on the Role of Filipino Women
NDCC	-	National Disaster Coordinating Council
NEDA	-	National Economic and Development Authority
NGOs	-	Non-Governmental Organizations
NIA	-	National Irrigation Administration
NMP	-	National Master Plan
NMYC	-	National Manpower Youth Council
NSDW	-	National Standard for Drinking Water
NSO	-	National Statistics Office
NSMP	-	National Sector Master Plan
NWRB	-	National Water Resources Board
O&M	-	Operation and Maintenance
ODA	-	Overseas Development Assistance
OECD	-	Overseas Economic Cooperation Fund
PA	-	Provincial Administrator
PAIASO	-	Provincial Accounting and Internal Audit Service Office
PBO	-	Provincial Budget Office
PD	-	Presidential Decree
PDC	-	Provincial Development Council
PEO	-	Provincial Engineer's Office
PHO	-	Provincial Health Office
PIO	-	Public Information Office
PGSO	-	Provincial General Services Office
PLGOO	-	Provincial Local Government Operations Officer
PMC	-	Project Monitoring Committee
PMO	-	Project Management Office
PMU	-	Provincial Monitoring Unit

## List of Abbreviations

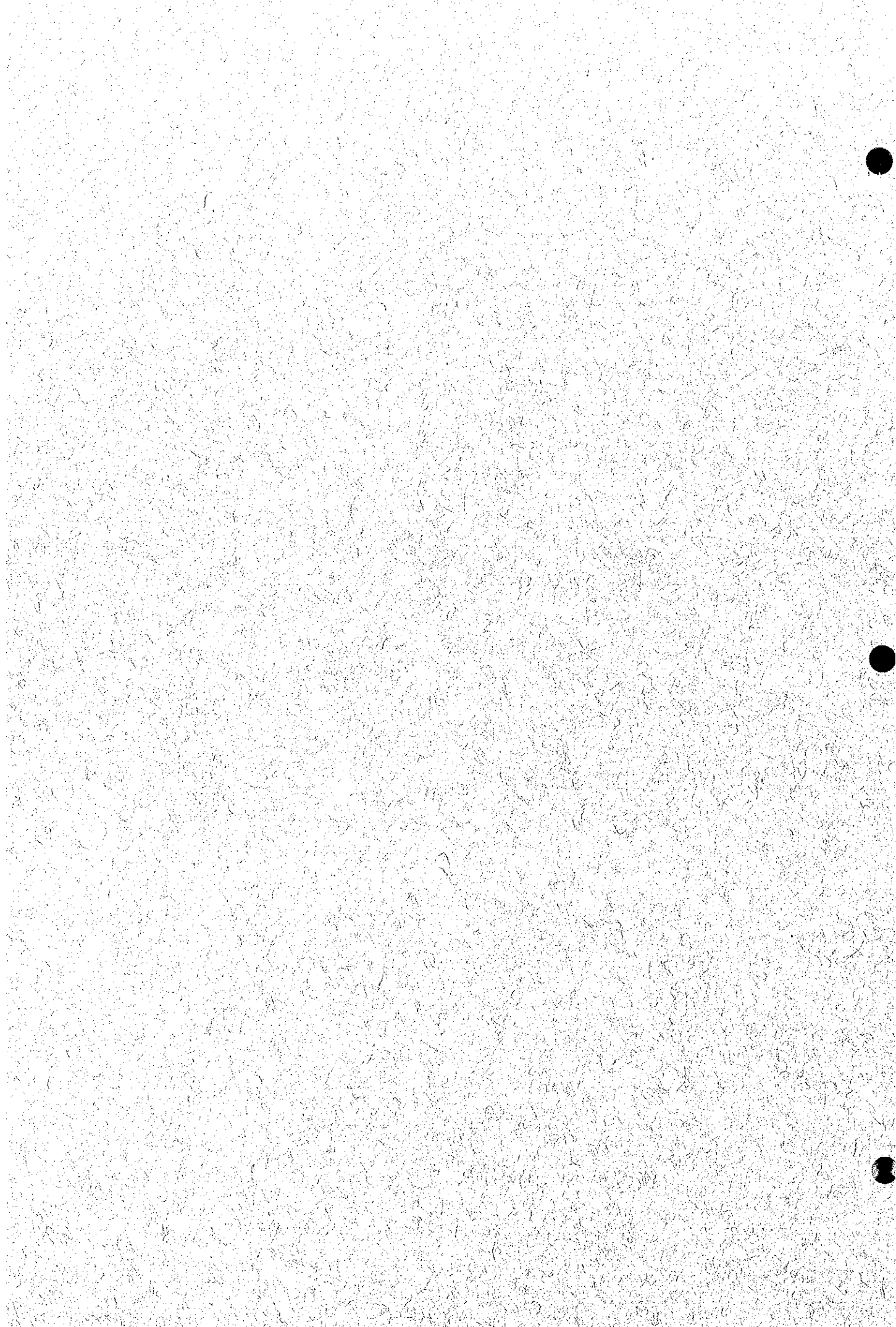
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POPCOM	-	Population Commission
PoW	-	Program of Work
PPAC	-	Philippine Plan of Action for Children
PPDC	-	Provincial Planning and Development Coordinator
PPDO	-	Provincial Planning and Development Office
PSPT	-	Provincial Sector Planning Team
PST	-	Provincial Sector Team
PTA	-	Parent Teacher Association
PTO	-	Provincial Treasury Office
PW4SP	-	Provincial Water Supply, Sewerage and Sanitation Sector Plan
PWSC	-	Provincial Water Supply and Sanitation Coordinator
PWSO	-	Provincial Water and Sanitation Office
RA	-	Republic Act
RDC	-	Regional Development Council
RDCC	-	Regional Disaster Coordinating Council
RHO	-	Regional Health Of
RHUs	-	Rural Health Units
RPMC	-	Regional Project Monitoring Committee
RSI	-	Rural Sanitary Inspector
RWSA	-	Rural Waterworks and Sanitation Association
SB	-	Sanggunian Bayan
SP	-	Sanggunian Panlalawigan
SSI	-	Supervicing Sanitary Inspector
SWL	-	Static Water Level
TESDA	-	Technical Education and Skills Development Authority
TCP	-	Teacher-Child-Parent
UNDP	-	United Nations Development Programme
UNICEF	-	United Nations International Children's Emergency Fund
VIP	-	Ventilated Improved Pit Latrine
WASAMS	-	Water and Sanitation Monitoring System
WATSAN	-	Water and Sanitation
WC	-	WATSAN Center
WD	-	Water District
WHO	-	World Health Organization
WID	-	Women in Development
WSSE	-	Water Supply and Sanitation Engineer
WSS-PMO	-	Water Supply and Sanitation-Project Management Office

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**EXECUTIVE SUMMARY**

**ES**



## EXECUTIVE SUMMARY

### 1. Introduction

#### Background and Objectives

The Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP) for the province of Davao del Norte was prepared by the Provincial Sector Planning Team with technical assistance from Japan International Cooperation Agency (JICA). The PW4SP will be the basis for execution of sector development from proceeds of sector loan by foreign donors, LGU's budget including internal revenue allotment from the National Government and private sector investments.

The PW4SP covers a Long-Term Development Plan (2004-2010) and a Medium-Term Investment Plan (1999-2003) to achieve the provincial targets of water supply, sewerage and sanitation sector. The plan includes arrangements and logistics for implementation and measures to strengthen operational frameworks and institutional capabilities that embody community development and gender responsiveness. As an initial step towards capability building, the Study was designed with the end view of strengthening the LGUs capability in sector plan preparation through conduct of series of workshop and hands-on training.

#### Planning Approach for Future Sector Development

The primary bases of the PW4SP are national sector policies and strategies, as well as major legislation and regulations relevant to the sector. The guidelines for setting the provincial sector targets are the three national level plans: the Philippine National Development Plan (1999-2024), the Water Supply, Sewerage and Sanitation Master Plan of the Philippines (1988-2000) and the Updated Medium Term Philippine Development Plan (1996-1998). The GOP recently approved the IRR providing detailed arrangements on the devolution of WATSAN responsibilities and resources. Parallel to this are the current sector policies and strategies, to wit: i) self-reliance and local community management of services; ii) an integrated approach to water, sanitation and hygiene education; iii) cost sharing arrangement; iv) cost recovery of capital and O&M; v) private sector participation; and vi) an integrated water resources strategy.

The PW4SP will help ensure that sector investments are optimized in consideration of fund and water source availability constraints as well as planning capacity. It is envisaged that the Plan

will be progressively updated as its implementation proceeds. Furthermore, future detailed studies and plans for project implementation shall be conducted in the context of the PW4SP.

A data management system was established as a tool to come up with the outputs commensurate to the objectives of the provincial plan and at the same time reflect the planning approach. It will provide a map of relative needs in the province allowing for adjustment and updating when further information becomes available. Different scenarios maybe worked out by planners using the program by changing key parameters based on planning assumptions and conditions.

#### Report Composition

Three (3) study reports were prepared as follows: i) Main Report (Volume I) which presents the results of the whole study consisting of 12 chapters; ii) Supporting Report (Volume II); and iii) Data Report (Volume III). Supporting materials including alternative studies and detailed calculations, and data/information constitute the last 2 reports.

## **2. Provincial Profile**

Davao del Norte is one of the 6 provinces and 2 independent chartered cities in Region XI, the Southern Mindanao Region. Tagum City is the provincial capital, which is about 55km north of Davao City. It is composed of 8 municipalities and 2 component cities, the newly created cities of Tagum and Island Garden City of Samal. These municipalities/cities have a total of 224 barangays, classified further into 20 urban and 204 rural. The province is classified as 1<sup>st</sup> class. At the municipal level, the municipalities/cities belong to 1<sup>st</sup> class (4 municipalities/city), 3<sup>rd</sup> class (2), and 4<sup>th</sup> class (4). There are no 5<sup>th</sup> and 6<sup>th</sup> classes municipalities. The population of the province was 671,333 in 1995 with an annual growth rate of 2.28% between 1990 to 1995.

#### Physical Features

The province has Type IV climate, which is typified by unpronounced dry and wet seasons. It is naturally protected by the mountain ranges that act as natural barriers from the onslaught of typhoons. Topography of the province is generally characterized by rugged, mountainous areas on the eastern part, by moderately to steeply sloping on the western part and wide alluvial plain areas on the central lowland. Elevations on the eastern edge ranges from 1,000 to 1,300 meters. The principal rivers are Tagum, Lasang and Hijo. These natural drainage systems generally flow southward and empty into Davao Gulf. About 44% of the total land area of the province are devoted to agriculture, while a mere 26.5% remain as forestland.



### Socio-economic Aspects

In consonance with its land use, agriculture is the major economic activity in the province. The average annual family income in 1994 was ₱ 59,584 which, was well below the national average of ₱ 83,161. Moreover, about half of the families lived within and below the established poverty threshold income of ₱ 41,579 in Region XI.

All the municipalities/cities have electric supply service, but household coverage is only 48%. Telecommunication service is also available to all municipalities/cities. Inter-municipal land transportation is available by means of jeepneys, mini-buses and buses. There are only 32 banking institutions and about 1,220 industrial/commercial and tourism-related establishments. With regard to social services, there are 400 schools, 30 hospitals, and 122 health units and barangay health stations.

Provincial population growth rates had been declining for the last 6 censal years. The 1998 population was estimated to provide the planning base for this provincial plan. Rural population accounts for 70%, while the remaining 30% are urban.

An indicator of health problem related to water supply and sanitation is the high incidence of water-related diseases. The reported cases in the province were typhoid/paratyphoid, dysentery, intestinal parasitism, diarrhea, conjunctivities, cholera, dengue fever, viral hepatitis, malaria, filariasis, schistosomiasis, skin diseases and scabies.

Environmental problems related to wastewater discharge and unsanitary solid waste disposals are occurring in parts of the province. Major pollution sources in urban areas are domestic wastewater and dumped garbage. Only 20% of the total households in the province relied on the municipal refuse collection services.

### **3. Existing Facilities and Service Coverage**

The service coverage of each sub-sector is estimated as percentages of served population/households/utilities against the total number. In water supply, safe classification of Level I facilities is introduced and further categorized into public or private. Apart from household toilets, school toilets and public toilets are included in the sanitation components in view of public hygiene improvement. Preliminary discussions on sewerage and solid waste management are also considered.

## Water Supply

There are 26 Level III systems in the province operated under different kinds of ownership (authority or association) in 8 municipalities/cities, namely; Asuncion, Carmen, Island Garden City of Samal, Kapalong, New Corella, Panabo, Santo Tomas and Tagum City. Majority of the systems utilizes deep well sources. Spring sources are utilized at 5 systems in Island Garden City of Samal and New Corella. Common issues encountered are insufficient water pressure resulting to limited connections and rationing, inadequate capacity of distribution pipes due to insufficient water sources and/ or inappropriate planning and designing, and delay of system expansion together with water source development. These problems are rather critical especially in Asuncion, Carmen, New Corella, Panabo and Tagum City. Water quality problems such as salty taste or muddy water are observed in Carmen and Island Garden City of Samal. The absence of regular disinfection is also a common issue. Collection efficiency of water charges is rather high at larger waterworks, but at small waterworks, even the analysis on charge collection is not practiced due to weak management practice.

There are 28 Level II systems in 7 municipalities/cities. Majority of these is utilizing spring sources (19 systems) of which the concentration is in Island Garden City of Samal. The remaining 9 systems are using deep well as a water source. These systems are covering 1 urban and 27 rural barangays. Among the 24 waterworks that responded in the questionnaire regarding water fee payment, about 80% impose an average flat rate of 10 Pesos/HH/month and the rest supplies water free of charge. In some of these systems, expansion of distribution line and installation of additional faucets are usually undertaken without appropriate technical study on the capacities of water sources and distribution facilities, resulting to decrease of supply pressure and quantity. Such practice has negative implications on the financial savings to cope with future repair and depreciation. Furthermore, cost recovery is a prerequisite in sector management.

Level I facilities are common in rural barangays, majority of which is privately owned. Of the 42,185 operational Level I facilities, shallow/open dug wells and rainwater collectors occupy about 95% in the province. In this PW4SP preparation, 20% of the shallow wells were estimated as unsafe source referring to information from the PHO. As a result, about 80% of the facilities were classified as unsafe sources, referring to the safe/unsafe definition of DOH. Most of these unsafe shallow wells are located in nearby potential pollution sources, hence, for new construction of shallow wells, proper site selection and appropriate construction method shall be applied together with periodic water quality monitoring. Percentage shares

between public and private Level I facilities for rural water supplies are 5% and 95%, respectively. The share of developed springs in public facilities is 5%.

About 49% or 352,800 of the present population (721,514 comprising 30% in urban area and 70% in rural area) are adequately served. Under area classification, 59% of urban population and 44% of rural population have access to safe water sources/facilities. Of the served population, 37% or 130,700 persons are served by Level III systems. About 56% or 197,900 persons depend on Level I facilities, while the rest relies on Level II systems.

#### Sanitation

The service coverage of sanitary toilets in the province is 73% or 103,154 of the total households, which is well above the national coverage of 60%. These sanitary toilets consist of 6% flush type, 68% pour-flush type and 26% VIP/sanitary pit latrine. In municipalities that have high water service coverage (Tagum City, Kapalong), high sanitation coverage occurs and adversely, in low water supply coverage (B.E. Dujali, Carmen), low sanitation coverage also occurs. This can be attributed to the development of water supply that almost always follows the upgrading of the sanitation facilities because of access to water.

Service coverage of household toilets in urban area is a high 83%, while in rural area, the coverage is only 69%. Although high percentage of sanitary toilets is disclosed in urban areas, problems arise from the unsatisfactory disposal of the effluent from the septic tanks or the direct discharge of wastewater to the local drains and eventually to the watercourses. Sullage management is unheard of. In urban areas, there are no sewerage facilities.

The province has a total of 1,878 toilets installed in 363 schools. Only 43% of the students is adequately served by sanitary toilets. The present average ratio of 93 students per sanitary toilet is well below the service level standard of 40 students per sanitary facility. Some of these facilities are not being used due to lack of water supply, destroyed plumbing fixtures and water tank seepage. There are 35 public utilities; public markets, bus/jeepney terminals, and parks or plazas. All these public utilities are served with sanitary toilets amounting to 100% coverage. However, the manner of usage and maintenance are improper rendering the facilities unsanitary. At present, no specific arrangements are made for the operation and maintenance, as well as the collection of fees to cover such cost.