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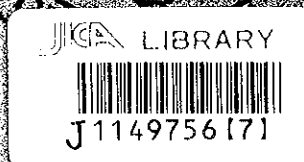
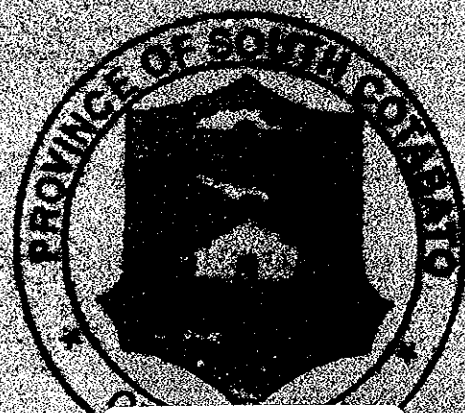
DEPARTMENT OF THE INTERIOR AND LOCAL GOVERNMENT  
THE REPUBLIC OF THE PHILIPPINES

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

VOLUME I — [5]

MAIN REPORT

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



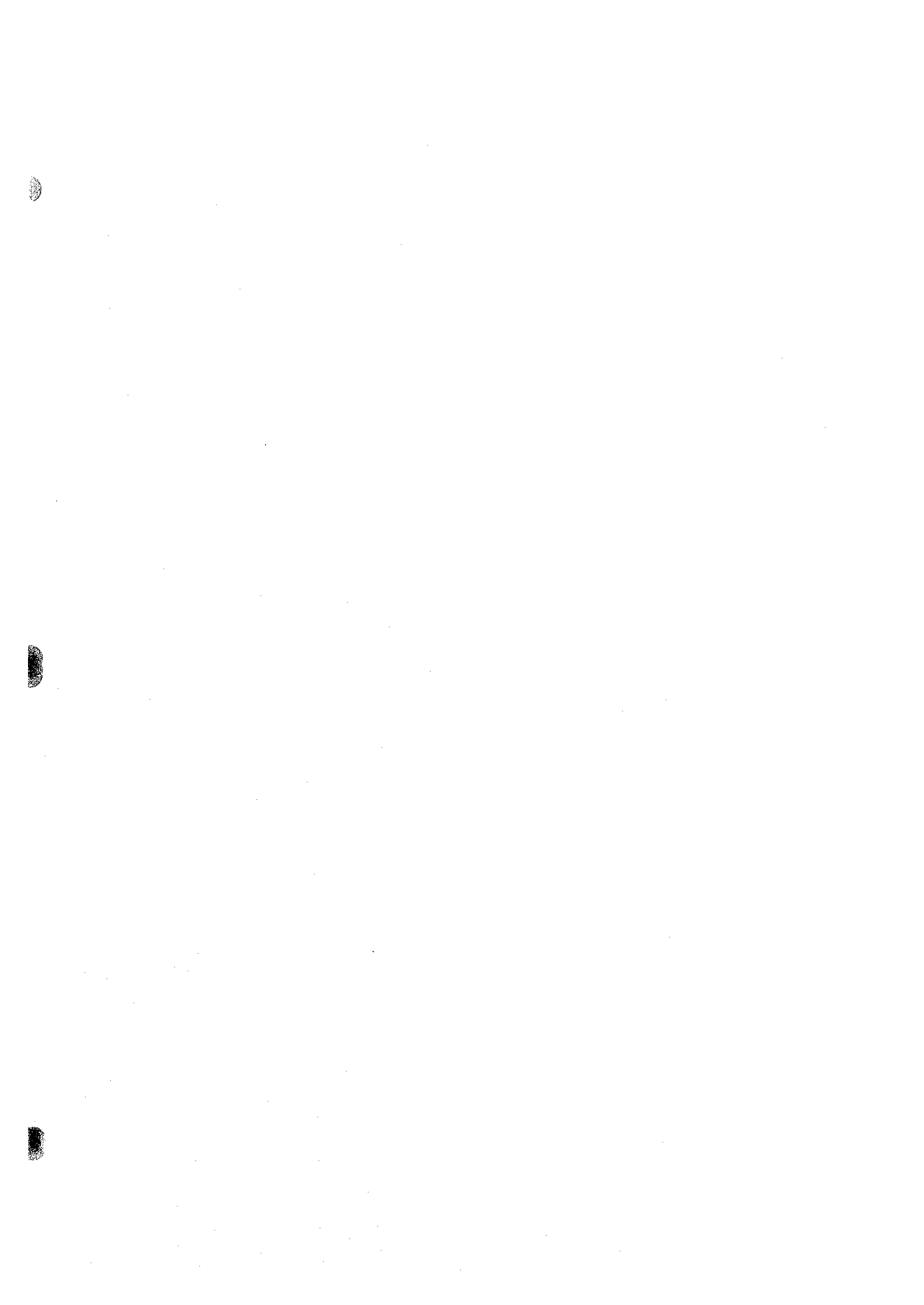
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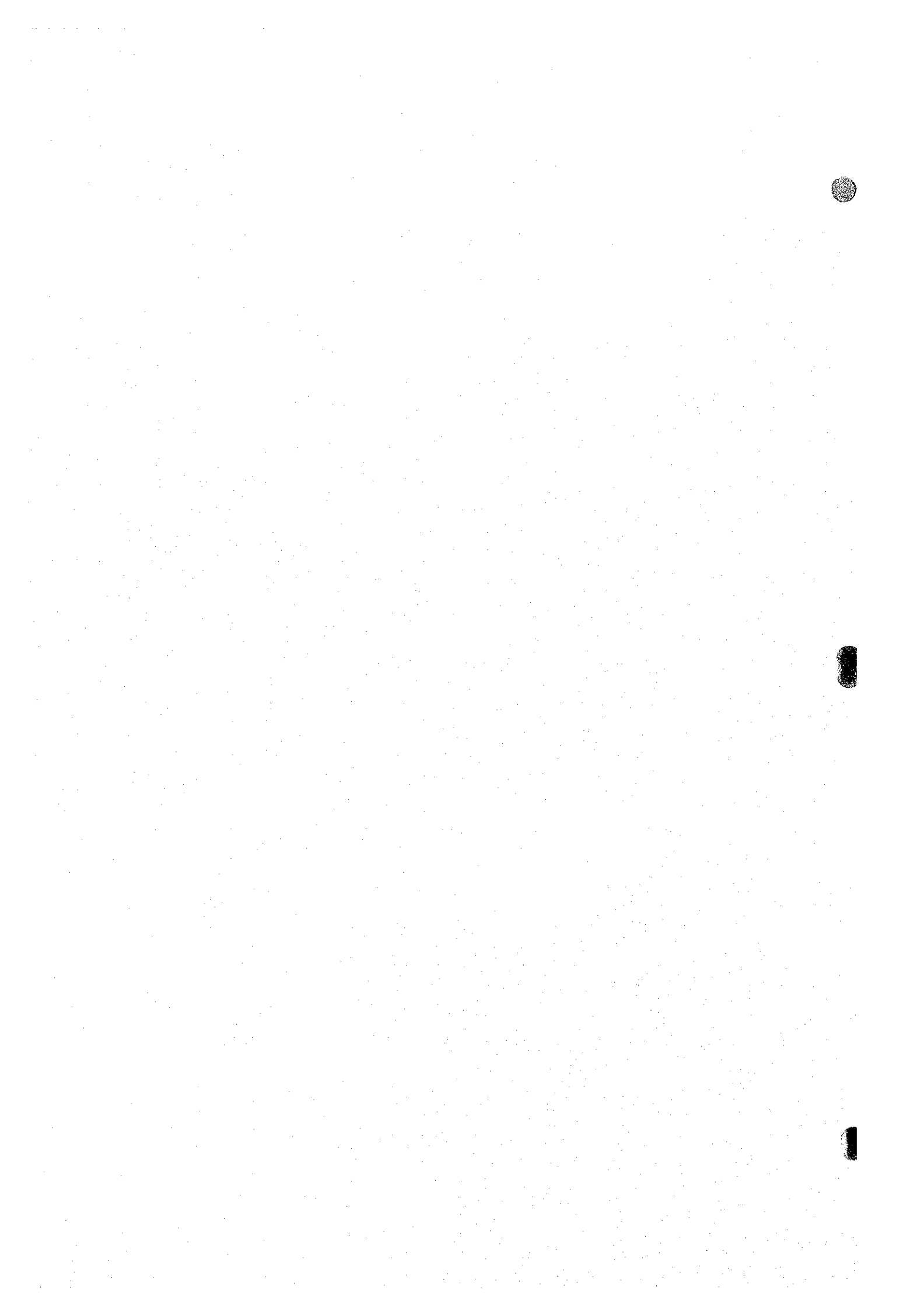
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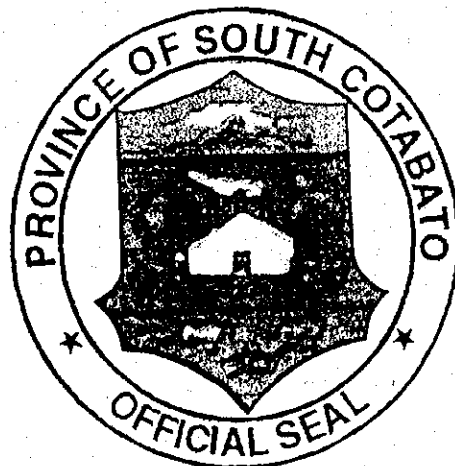
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MARCH 1999

NIPPON JOGESUIDO SEKKEI CO., LTD.



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Republic of the Philippines  
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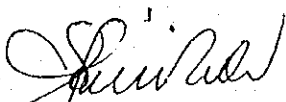
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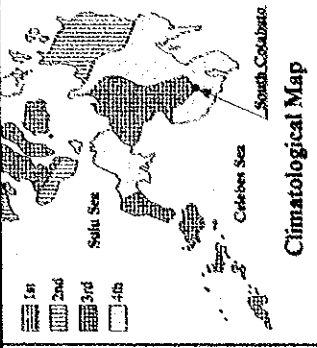
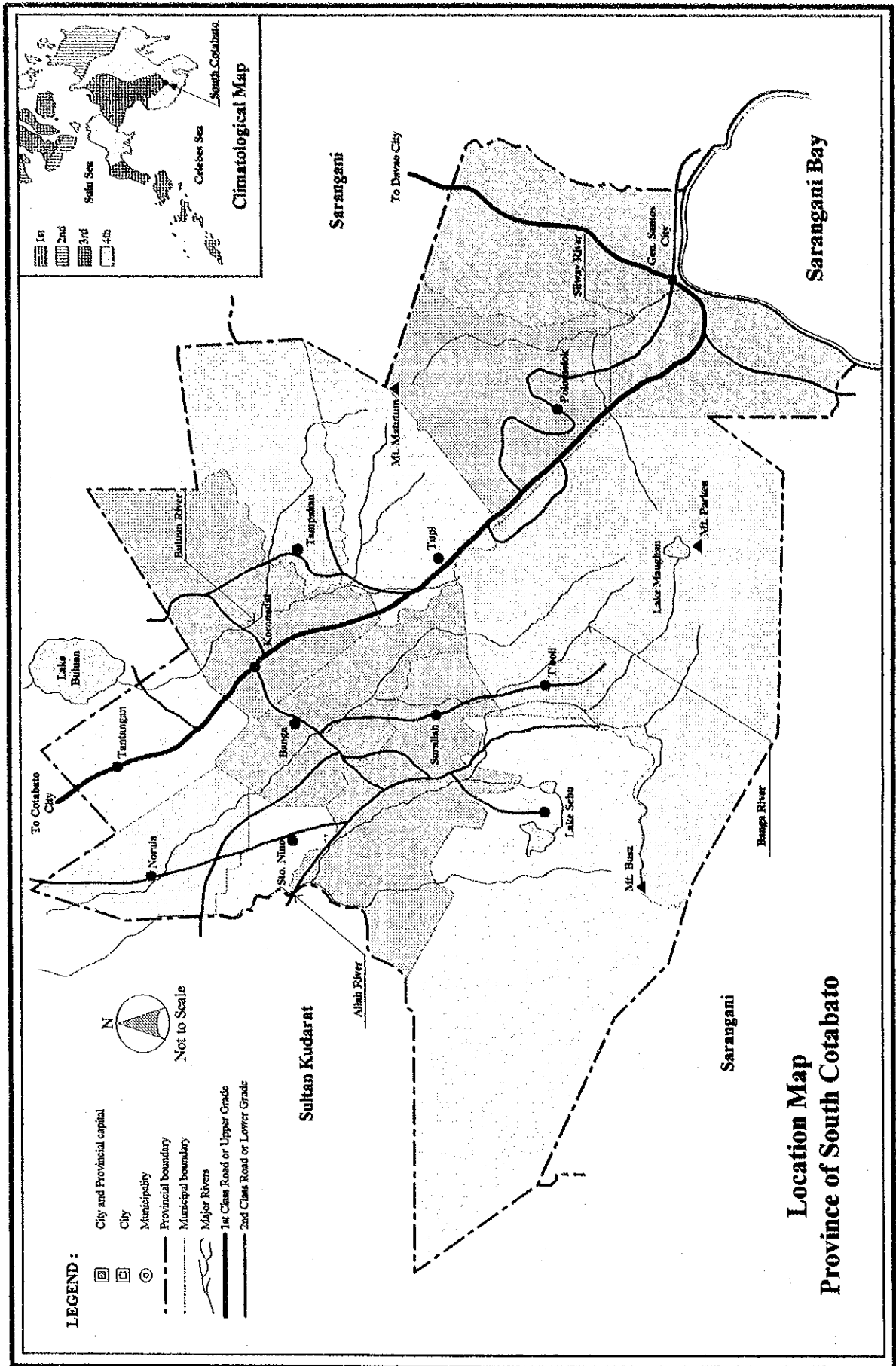
*Our vision of becoming a premier agri-industrial province in the south poses a greater challenge of managing the pace and direction of our socio-economic development with the end in view of improving the quality of life for South Cotabatenos. As embodied in the provincial **Comprehensive Development Plan (CDP)**, our overall development agenda are carefully formulated to address the problem of poverty through integrated sectoral strategies.*

*The **Local Government Code of 1991** mandates the transfer of responsibility in planning and implementing water and sanitation projects from various national agencies to the local government units. Moreover, the prevalence of water related disorders brings to the fore the compelling need to focus more meticulously on the water and sanitation concern, hence, the **Provincial Water Supply, Sewerage and Sanitation Sector Plan (PW4SP)**. This plan which is basically an offshoot of the CDP is anchored on the policy of pursuing sustainable development through judicious utilization of our water resources and by assuring its equitable distribution.*

*The task of providing sufficient water supply may seem formidable but is certainly within our means. It is reassuring to note that we have the support of the private sector with whom we have forged a partnership that has grown from a solid base of shared interests, talents, experiences and finances as we continue to work together in meeting our constituent's present demands and the needs of the future.*

*Given the limited government resources and consistent with our goal of alleviating poverty, it becomes imperative for the province and its municipalities to further intensify its water and sanitation interventions to the poor and the marginalized. And using this plan as a guide, we are therefore encouraging the active participation of the private sector in order to complement our effort by way of investing on water supply in more affluent areas.*

  
**HILARIO L. DE PEDRO III**  
Provincial Governor



**LEGEND:**

- City and Provincial capital
- City
- Municipality
- Provincial boundary
- Municipal boundary
- Major Rivers
- 1st Class Road or Upper Grade
- 2nd Class Road or Lower Grade

N  
 Not to Scale

**Location Map  
 Province of South Cotabato**



**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

---

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
OECF	-	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

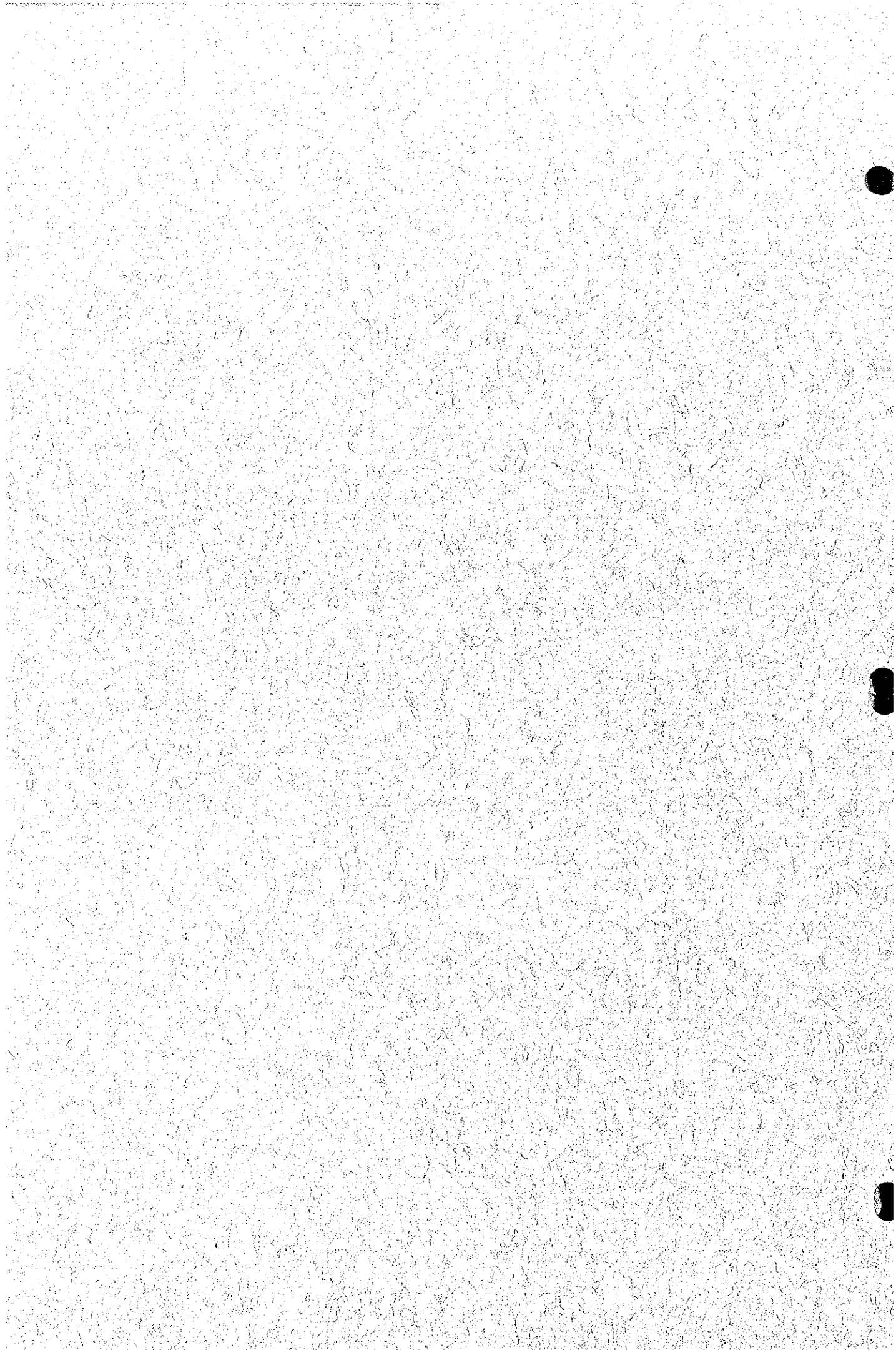
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POPCOM	-	Population Commission
PoW	-	Program of Work
PPAC	-	Philippine Plan of Action for Children
PPDC	-	Provincial Planning and Development Coordinator
PPDO	-	Provincial Planning and Development Office
PSPT	-	Provincial Sector Planning Team
PST	-	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 South Cotabato 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**

The landlocked province of South Cotabato is one of the 6 provinces in Region XI, the Southern Mindanao Region. Koronadal, the provincial capital is about 58km from General Santos City, one of the region's growth centers. The province is composed of 11 municipalities with 198 barangays, of which 35 are urban and 163 rural. It is classified as 1<sup>st</sup> class. At the municipal level, there are 3 municipalities that are 1<sup>st</sup> class, 1 municipality (2<sup>nd</sup> class), 3 municipalities (3<sup>rd</sup> class) and 4 municipalities (4<sup>th</sup> class). There are no 5<sup>th</sup> and 6<sup>th</sup> classes municipalities. The population of the province was 623,784 in 1995 with a high annual growth rate of 4.16% between 1990 to 1995.

#### Physical Features

South Cotabato has Type IV climate, which is characterized by unpronounced dry and wet seasons with rainfall that is more or less evenly distributed throughout the year. The province is virtually free from typhoons. The 2 major geomorphic features of the province are the Cotabato Cordillera and the Cotabato Basin. The Cotabato Cordillera is a mountain range of moderate to high relief extension starting from Cotabato City and extending up to Sarangani Bay. The Cotabato Basin is a broad alluvium-filled valley formed by the tributaries of Mindanao River. Young volcanic mountains constitute the central highlands of the province, the most prominent is Mt. Matutum.



Principal river systems are Allah, Banga, Buluan and Silway. The province has 4 lakes, Lake Sebu, Lake Maughan (at the crater of Mt. Parker Volcano) and 2 other smaller lakes. Gold mining activities if left uncontrolled are potential sources of surface water pollution. About 40% of the total land area of the province are devoted for agriculture, while a mere 23% remain as forestland. There is an urgent need to rehabilitate the watersheds in order to pursue a sustainable growth of the province.

#### Socio-economic Aspects

In consonance with the land use, agriculture is the major economic activity in the province. The average annual family income in 1994 was ₱ 61,435 which, was below the national average of ₱ 83,161. Moreover, about 35% of the total number of families lived within and below the established poverty threshold income of ₱ 41,579 in Region XI.

All municipalities have electric supply service with a high 75% household coverage. Telecommunication is also available in all municipalities. Land transportation can be obtained by means of jeepneys, cars, taxis and buses. There are 39 banking institutions, 47 industrial/commercial establishments and 31 tourism-related facilities. With regard to social services, there are 364 schools and 28 hospitals.

Provincial population growth rates had been declining for the last 6 censal years. The 1997 population was estimated to provide the planning base for this provincial plan. Urban-rural classification of barangays was modified to reflect actual conditions of the area and using this classification, rural population accounts for 63%, while the remaining 37% 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, diarrhea, dysentery, dengue fever, viral hepatitis, filariasis, malaria and schistosomiasis.

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 8% 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. Aside 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

The province has 15 Level III systems in 6 municipalities, namely; Koronadal, Norala, Polomolok, Surallah, T'Boli and Tupi. Majority of the systems utilizes deep well sources. Spring sources are utilized in 4 systems. While, 6 systems adopt the combined system with communal faucet (Level II service). Common issues encountered are insufficient water pressure resulting to limited connections and rationing, inadequate capacity of distribution pipes due to inappropriate planning and designing, and no regular disinfection. Collection efficiency of water charges is quite high in bigger waterworks, but among small waterworks, even the analysis on charge collection is not practiced due to weak management practice.

Sixty-seven (67) Level II systems, mostly using springs, are operating in all the municipalities covering 1 urban and 68 rural barangays. However, 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. Most of the waterworks using spring sources supply water to the users free of charge. While the systems utilizing deep well sources impose a minimum level of flat rate water charges ranging from ₱ 5 to ₱ 45 monthly per household. 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 are privately owned. The 37,664 operational Level I facilities in the province consist of shallow, deep and dug wells and springs. Of these facilities, 19,959 are considered as safe sources. Among the unsafe sources are 17,558 shallow wells and 147 open dug wells. Most of these unsafe sources 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 2% and 98%, respectively. The share of developed springs in public facilities is 5%.

About 59% or 385,000 of the present population (657,200 comprising 37% in urban area and 63% in rural area) are adequately served. Under area classification, 63% of the urban population and 56% of the rural population have access to safe water sources/facilities. Of the served population, only 11% or 71,300 persons are served by Level III systems. About 41% or 267,700 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 67% or 87,250 of the total households, which is higher than the national coverage of 60%. These sanitary toilets consist of 1% flush type, 72% pour-flush type and 27% VIP/sanitary pit latrines. In municipalities that have high water service coverage (Norala, Polomolok), high sanitation coverage occurs and adversely, in low water supply coverage (Lake Sebu, T'boli), 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 easy access to water.

Service coverage in urban area is 75%, while in rural area, the coverage is quite low at 63%. 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. Sullage management is unheard of. In urban areas, there are no sewerage facilities.

The province has a total of 2,599 toilets installed in 405 schools. Only 62% of the students is adequately served by sanitary toilets. The present average ratio of 65 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 38 public utilities; public markets, bus/jEEPney terminals, and parks or plazas. About 97% of these are served with sanitary toilets. Although considered as sanitary, 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 regular collection of fees to cover such cost.

#### **4. Existing Sector Arrangements and Institutional Capacity**

##### Institutional Framework

The Local Government Code has essentially re-defined the roles, relationships, and linkages of central, provincial, municipal and barangay institutions in the provision of social basic

services, including water and sanitation. The new direction mandates the LGUs to play a larger role in planning and implementing water supply and sanitation projects. However, this has raised serious institutional capacity and resource reallocation issues.

Drastic changes took place among the DPWH, DILG, DOH and LGUs after the government's decentralization and issuance of NEDA Board Resolution No.4 (1994). To ensure common interpretation of the Resolution, the Implementing Rules and Regulations (IRR) for the relevant sector was prepared. The role of implementing water supply projects, which DPWH used to undertake, has been transferred to the LGUs. The functions of the then IPHO under the DOH have also been devolved to the LGUs. It is now the DILG, which provides overall coordination over the implementation of WATSAN projects of LGUs. The Water Supply and Sanitation-Project Management Office (WSS-PMO), a unit within DILG, is the main office responsible for water and sanitation activities.

At the provincial and municipal levels, there are central agency field offices (DPWH and DILG) and LGU offices working on the sector. Water districts, RWSAs, and BWSAs have been organized to deliver the services. Some LGUs implement and operate municipal or provincial water and sanitation systems. Project management offices (PMOs at the central level), ad hoc inter-agency committees, and task forces have been organized to address coordination issues.

The current major institutional issues are: (1) managing the transition process, and (2) re-establishing the leadership for the sector. Major resource realignments and capacity building initiatives are needed. At the local level, the LGUs' capability to handle sector projects is insufficient and will require substantial input and support.

There is wide dissatisfaction among implementors themselves over the existing monitoring system. This leads to the problem of reliability of information coming from the field. There is a need to establish a system similar to project-based monitoring which will have a direct link to performance.

#### Community Development

The Province of South Cotabato considers water supply and sanitation projects to be on the forefront of provincial sector development programs. In fact, the province prides itself of opening various forms of soliciting community participation in WATSAN sector projects. Aside from the manner by which CD/CO work was executed in past sector projects, particularly the Barangay Water Program and the Integrated Community Health Services, people's

participation has been "institutionalized". This entails the participation of beneficiaries in site selection and facilities design; the provision of free labor, sites and materials during project implementation; and the involvement in repair and maintenance of the facilities.

The PPDO maintains a unit that conducts CD work, but the person assigned there is not focused solely on WATSAN sector projects. Most municipalities have CD units; but these remain boxes in the organizational chart because they are not manned. As such, there is an apparent lack of a permanent structure and of the identified major responsible players on CD in the LGUs. These create a serious gap to the critical linkage and support of sector projects, from the provincial to the municipal and as far down as the barangay levels.

Training programs that should update the knowledge and skills of LGUs on CD/CO work have been very few and far between. There is a need to strengthen the capability of CD/CO workers through regular training that permeates all levels of the LGU hierarchy. There are several NGOs that can be tapped in assisting the Province in doing CD/CO work should the need arise.

#### Gender Consideration

The Province of South Cotabato, through the Provincial Population Office, has been implementing gender-sensitive projects. It has also been very active in conducting gender sensitivity training programs for municipal officers and health workers. The inclusion or utilization of gender-sensitive approaches to planning WATSAN projects has been limited. However, it is being undertaken more on health and sanitation as well as in hygiene projects.

Key informant surveys and group interviews were conducted to determine the degree of community participation on the sector of barangay officials and their constituents, with emphasis on gender-related issues. The following were the findings from the surveys:

- The barangay councils were male-dominated; all barangay captains in selected sites were males.
- There is neither gender bias nor lack of gender responsiveness when it comes to sector activities and projects. Women actively participate in the O&M of water facilities.
- Women constituted the majority of the population in the two barangays. The men, however, outnumbered women in the barangay councils.
- The women were responsible for fetching water which, was done once a day for 10 minutes.

- There was a BWSA in each of the two barangays. But while most of the respondents were BWSA members, they were not actively involved in their affairs. However, the female members committed more support and participation to future WATSAN projects.
- The males have attended various training programs more than the females. Both the male and female respondents, however, wanted to attend training programs for BWSA members, including health education.
- Both men and women were consulted when the BWSA was formed although on past projects, it was the men who were mostly consulted. All the respondents indicated they would participate in future projects.
- The female children were mostly afflicted with water-borne diseases during the past year. The leading cause was diarrhea.

#### 5. **Past Financial Performance in Water Supply and Sanitation**

Since the devolution of the water supply and sanitation project to the LGUs in 1992, the LGUs have been dependent on the Internal Revenue Allotment (IRA) for their financial requirements. For the period 1994-1998, the IRA of the province represented about 90.36% of the total income. The province has an economic enterprise, the gymnasium and cultural center which rents out commercial spaces and leases out the gymnasium for sports activities, cultural presentations, concerts and conventions. Occasionally, heavy equipment for road construction projects is made available to other LGUs and private contractors on rental basis. On the other hand, actual expenditures for the same period were 56.73% of the total revenue, which were mainly broken down into capital outlay (10.70%) and operation and maintenance expenses (33.55%). The province has acquired a loan amounting to ₱ 7.2 million for heavy equipment from the Land Bank of the Philippines to be paid within 5 years (up to year 2000). They also have an outstanding loan from the MDF.

The funds for the water supply sector are part of the capital outlay of the province. The amount of debt servicing capacity of the provincial government is computed to be ₱ 41.93 million for the year 1998, which represents the maximum loanable amount through the MDF.

Funds for the capital outlay are mainly derived from 20% DF of the IRA and part of which is the water supply and sanitation sector allotment. Except for 1995, in most years, the 20% DF was sufficient to finance the capital outlay requirements. Due to the low availability of funds, the relevant sector accounts between less than 1% to 6.7% of DF or about 1.34% of IRA.

Planned sector investments during the period 1995-1998 amounted to about ₱ 2.9 million but the actual expenditures disbursed for the sector out of the 20% DF was ₱ 3.87 million and was 29.7% higher than the required investments. Of the investments, Level II and III investments amounted to about ₱ 2.4 million, while Level I water supply was less than ₱.5 million.

The DPWH and the DILG implemented the sector projects in previous years. The DPWH, through its DEOs, still receive requests for assistance from barangay people. With regard to the capital cost recovery for Level I water supply, it was free to the community in the past. For Level II systems, the capital cost is shouldered by the RWSAs through a loan or grant, while for Level III, the WDs or RWSAs bear the entire cost. Those for Level III are usually financed by the LWUA for a period of up to 30 years with interests ranging from 8.5% to 12.5 %. For less capable WDs, soft loans without interest for the first 5 years of operations are available. Regarding sanitation sector, construction of the superstructure and the depository of household toilet is through self-help.

In 1998, a cost-sharing scheme was authorized, which prescribed that for any central government grants that are provided for the development of Level I water supply and sanitation facilities to the limited municipalities, the LGUs and beneficiaries concerned shall share the capital cost required. No subsidies from the central government will be provided for the construction of Level II and Level III water supply systems.

The O&M cost for Level I and II water supply system is the responsibility of the users. It is mandatory that the community shall organize themselves into an association, which handles collection of water charges as well as O&M of the facility. However, most of the RWSAs and BWSAs reportedly had difficulty managing the systems, since beneficiaries do not recognize the cost requirements. The monthly fees for Level I in the active association range from ₱ 10 to ₱ 50 /household /month. For Level III system, the O&M cost is basically covered by the user's fees. LWUA's policy is to make WDs financially viable, self-sufficient and be able to repay their loans obtained to improve water supply services. There are 5 WDs and 10 waterworks, which are currently operational in the province.

The percentage of water fee to median monthly household income is about 3.54% for Level III, 1.92% for Level II and less than 1% for Level I. Thus, the current water rates in all service levels are within an affordable range. On the other hand, construction cost of household toilet seems to be expensive comparing with the family income.

## 6. Water Source Development

The study on water source development covers the entire province. It gives an emphasis on groundwater availability rather than surface water considering its economic advantages and current practices in potable water use.

The geologic rock units observed in the province are classified into 3 main groups based on the ages of the rock formation: the Miocene and Older Systems, the Plio-Pleistocene Series, and Recent Deposits. The Miocene and Older systems are distributed in the mountainous areas on the eastern, northeastern, southwestern, and southwestern sides of the province. The Plio-Pleistocene series are widely distributed in the mountainous areas around the Miocene and Older systems on the eastern, central, and western sides of the province. The Recent Deposits are largely distributed on the northwestern side of the province and are in parallel that extend from southeast to northwest. Also, the Deposits widely cover the circumference area of General Santos City on the southeastern side of the province.

For planning purposes in the development of groundwater sources, the provincial area is divided into shallow well, deep well and difficult areas. No solo shallow well area is defined in the province. Deep well area covers about 75% of South Cotabato, while difficult area falls on the remaining area. Brackish water is observed in shallow and deep wells along the national highway of the northwestern alluvial plain, where the municipalities of Koronadal and Tantaran are located.

Based on the inventory of water sources prepared during the study, the province has 100 developed springs currently serving the province, which come out from the high mountain areas on the northeastern and southwestern parts, and from the mountain range area on the central part of the province. A total of 34 untapped springs for future development is reported in the Cotabato Cordillera and piedmont of the Roxas Range. Other municipalities have few untapped springs.

Based on the existing well inventory, the depth of potential aquifers occurs between 20 to 150 meters in the Recent alluvium and the Plio-Pleistocene rocks. The development of deep wells is more advantageous than shallow wells considering the safe quality and invariable yield of deeper aquifers.



For the preparation of the medium-term development plan in terms of water source development, utilization of spring sources was given first priority, with special attention to the development of Level III systems. Groundwater source availability as second priority was presented by municipality with standard specifications of wells, including parameters such as well depth, static water level and specific capacity.

For the furtherance to design the concrete specifications of the planned wells, recommendations are made to conduct detailed groundwater investigations entailing the construction of test wells, prior to the detailed design or in the pre-construction stage. The municipalities that fall on this group are Koronadal and Banga.

Untapped springs shall also be surveyed to confirm the development possibility in the detailed groundwater investigation. This will include items on the following: i) location and type of spring sources; ii) fluctuation of discharge rates through the year; iii) distance from spring sources to proposed service areas; and iv) elevation differences between the source and service areas.

## **7. Future Requirements in Water Supply and Sanitation Improvement**

### Physical Targets and Service Coverage

Phased requirements for the sector development in the province are assessed to meet the provincial targets established as percentages of beneficiaries or utilities to be served by sub-sector. Targets of service coverage for water supply in Phase I development are established to increase slightly than the current service coverage in both urban and rural area as shown in Table 7.1. Sanitation sector target is applied in order to attain sufficiency and balanced distribution of the facilities in urban and rural area as embodied in the PNDP. Sewerage target is set for only part of urban centers in the long-term development, while solid waste management considered the medium-term household requirements. Logistic support is considered as a minimum requirement of LGUs for the implementation of PW4SP. The types and number of well drilling/rehabilitation equipment and supporting vehicle for Level I facilities are identified as reference information. Also, minimum requirements for setting up a provincial laboratory to support drinking water quality surveillance and monitoring activities are described.

**Table 7.1 Present Service Coverage and Sector Targets**

Sub-Sector	Area/Type	Base Year Service Coverage	Provincial Sector Targets	
			Phase I	Phase II
Water Supply	Urban Area	63	65	95
	Rural Area	56	58	93
Sanitation	Urban HH Toilet	75	85	93
	Rural HH Toilet	63	75	93
	Public School Toilet	64	80	90
	Public Toilet	97	100	100
Sewerage	Urban Area	0	Not applicable	50
Solid Waste	Urban Area	21	90	Not applicable

Frame values are projected by municipality for respective sub-sectors; future population by urban and rural area, the number of students in public schools and the number of public utilities.

Required Facilities to Meet Target Services

Types of required facilities and their implementation criteria are determined according to service level standards as adopted by the NSMP and NEDA Board Resolutions. Urban population is planned to be served by Level III systems, however, existing Level I and II facilities are to be used during Phase I period. Level I facilities are adopted for rural water supply with limited application of Level II system where houses are clustered and suitable untapped springs are confirmed. However, it does not exclude from being implemented Level I and II facilities in urban area as individual cases in the future as well as Level III systems in rural area. Rehabilitation work is planned only for new deep wells (Level I) to be constructed under PW4SP, considering the difficulty of rehabilitation for existing wells constructed by means of traditional methods. Facilities for the provincial laboratory are determined, taking into account the existing facilities and the exigency to examine the water samples at the right time.

In sanitation sector, pour flush and/or flush type household toilets are planned, while VIP type household toilet and sanitary pit latrine are considered in rural area as an intermediate measure. Sewerage program is planned in Phase II for limited urban area. The study on solid waste considered only the number of required trucks for the year 2000. Additional service coverage of the sector by phase is shown in Table 7.2.

**Table 7.2 Additional Service Coverage by Phase**

<i>Sub-Sector</i>	<i>Area/Type</i>	<i>Unit</i>	<i>Additional Service Coverage</i>	
			<i>Phase I</i>	<i>Phase II</i>
<i>Water Supply</i>	<i>Urban Area</i>	<i>Persons</i>	31,703	227,620
	<i>Rural Area</i>	<i>Persons</i>	64,272	243,378
<i>Sanitation</i>	<i>Urban HH Toilet</i>	<i>No. of Households</i>	13,790	29,156
	<i>Rural HH Toilet</i>	<i>No. of Households</i>	28,833	61,130
	<i>Public School Toilet</i>	<i>No. of Public School Students</i>	51,914	47,243
	<i>Public Toilet</i>	<i>No. of Utilities</i>	10	14
<i>Sewerage</i>	<i>Urban Area</i>	<i>Persons</i>	<i>Not applicable</i>	161,339
<i>Solid Waste</i>	<i>Urban Area</i>	<i>No. of Households</i>	34,069	<i>Not applicable</i>

The necessary water supply facilities for Phase I include 9 deep wells/spring sources for 6,300 house connections in urban area, and 27 Level II systems with spring sources and 667 Level I wells/springs for rural area. For Phase II, 36 deep wells/spring sources for additional 56,900 connections and 4,062 Level I wells/springs are required for urban and rural water supplies, respectively. It is assumed that 30% of Level I facilities will be implemented by the LGUs and 10% of these public facilities will be allocated to spring development. Rehabilitation requirements are considered to be 10% of the total number of deep wells to be constructed under PW4SP. Three (3) sets of water quality test instruments/equipment will be necessary; one set to upgrade the existing provincial laboratory in Koronadal, and the other 2 sets, for the new laboratories to be set up at the municipal hospitals of Polomolok and Sto. Nino.

For urban water supply, 1 Level III system is, in principle, considered for urban area of every municipality. In municipalities with existing Level III system/s, the expansion of the existing system/s was first considered. In case there are no Level III system, a new system was recommended. Existing plan/s on the development of Level III/WD are also taken into account to determine respective systems of the municipalities.

Currently, 6 of the 11 municipalities have no Level III system in the respective urban areas, namely; Banga, Lake Sebu, Sto. Nino, Tampakan, Tantangan and T'Boli. At present, there is no particular plan/on-going project except for the expansion of Tupi WD. However, the province will apply for the urban water supply project, which is coordinated by the DILG. The study on the utilization of lake water at Lake Maughan was recently commenced.

With regard to source development, spring sources in Lake Sebu and T'Boli may be fully used for Level III systems, while for other municipalities, deep wells may be utilized.

Merging of municipal systems (physical arrangement together with integrated management system) in the long-term shall be considered. Conditions to be studied include; water source availability, willingness of concerned municipalities and technical study on cost recovery/economical construction. The following municipalities may be studied for the integration, both in physical and management systems:

- Norala and Sto. Nino
- Surallah and Banga
- Koronadal and Tampakan

Integration of small Level III systems for the operation and management shall be sought, although these systems are currently managed individually.

Moreover, Phase I sanitation will require 13,790 household toilets, 72 public school toilets and 10 public toilets for urban area. For rural area, 28,833 household toilets and 185 public school toilets are necessary. Solid waste disposal will need 11 refuse collection trucks. For Phase II, urban area will require 29,156 household toilets, 85 public school toilets and 14 public toilets. For rural area a total of 61,130 household toilets and 606 public school toilets are necessary.

## 8. Sector Management for Medium-Term Development Plan

### Institutional Framework

To effectively manage the water and sanitation sector, the provincial and municipal governments will have to make adjustments in their current policies and structures. One glaring basic institutional need at the local level is a common vision and mission statement for the sector. A critical mass of people with resources who share in the vision must be identified and harnessed for sector management. Local planners need to focus on the long-term requirements.

The following policy and strategy statements will be adopted by the Provincial Government:

- Facility management with emphasis on sustainability
- Project selection and prioritization based on commitment of the beneficiaries, beneficiaries' willingness to pay, current water and sanitation and health conditions, and potential for growth
- Technologies appropriate to local conditions and resources. Economical facilities, without necessarily insisting on low-cost construction
- An integrated approach to the provision of potable water supply, sanitation, and hygiene education

- Equitable provision of water supply and sanitation between rural and urban areas; between wealthy and depressed areas
- Self cost recovery and rational cost sharing (subsidy)
- Private sector participation
- Seeking potential sources of local and external funds (loans and grants) to finance the capital requirements of the sector
- Broader concern for environmental protection and management in sector development
- Provision of water supply and sanitation services under emergency conditions

In coordination with appropriate national and local agencies, the LGU shall endeavor to set up a coordinated regulatory framework considering, among others, the following: water allocation and water rights policies (conflict resolution); water rate review; association registration; water quality, etc.

It is assumed that national and external funds although diminishing, will continue to be channeled through local offices of central agencies in the medium-term.

In the medium-term, a full-time Provincial Water Supply and Sanitation Unit (PWSU) shall be operational, which may be augmented at the PPDO. The LGU should ensure that adequate logistics and incentives are provided for the Unit. In the long term, the Unit may be promoted to the same level as the PPDO. The PWSU will continue to implement, assist and monitor all water supply and sanitation services in cooperation with the municipalities. The DILG-PMO shall continue to provide technical and managerial assistance in the formative years of the PWSU.

For institutional arrangements, the formation of BWSAs for Level I systems and RWSAs for Level II and III systems will be a prerequisite. The community, especially the women's sector, shall be involved in all phases of project management (planning, construction and O&M) and in undertaking health and hygiene education programs. To provide the members with the necessary skills, training programs will be implemented by concerned national agencies and by the provincial and municipal governments.

#### Community Development

To ensure that full participation of the beneficiary community in sustaining sector projects is realized, it is recommended that the LGUs provide the needed human, financial and other material resources for community development work to take-off. To institute the linkage among all the actors in sector development, a CD Unit should be established within the pro-

posed Provincial Water Supply and Sanitation Unit. A permanent CD Specialist shall be appointed to take charge of promoting, developing and coordinating CD and IEC programs of the province, even looking into how it can harness the participation of the private sector and train project beneficiaries. It is also recommended that a CD Specialist be assigned to the existing Municipal WATSAN Liaison Task Force to coordinate and implement all CD/CO and IEC work at the municipal level. At the barangay level, it is recommended that each Barangay Development Council (BDC) establish a WATSAN Committee that will coordinate all sector projects in the barangay as well as designate one person who can be trained on CD work.

The power of information, education and communication as a necessary foundation activity for CD has not been fully realized and maximized. It is, therefore, recommended that a comprehensive IEC program be conceptualized and implemented on the national, provincial and municipal levels. The program will promote a better awareness and understanding of the responsibilities of sector planners as well as the benefits due to the project beneficiaries so that the gains of the sector can be sustained on a long-term basis.

It shall be the DILG who shall retain the central role as the national government agency that promotes and develops the capacities of the province and the municipalities in participatory CD approaches and IEC programs for the sector. It shall also encourage and institutionalize the participation of national NGOs, with local networks or offices that specialize in community management program and utilize these to enhance and assist the LGUs in organizing project beneficiaries. Another national agency, the LWUA, shall on the other hand, continue to promote community participation in the formation of LGU-WS into water districts and to provide regular CD assistance particularly in consultation with the community on projects, loans, and water rates adjustments.

The LGUs and the intended beneficiaries can both participate in sector development: Level I – for the planning and implementation of sector projects and in the formation and management of a water supply and sanitation association/cooperative; Level II – for the formation of a water supply and sanitation association/cooperative or a waterworks; while Level III – for the formation of water districts or LGU-operated waterworks. Thus, it is important that the LGUs make the decision on the projects it can afford to implement.

To achieve this, the LGU must encourage active community participation and involvement through four approaches. These are: (1) sharing relevant information on the project with the beneficiaries, (2) consulting with users on all phases of project development; (3) giving am-

ple room to the beneficiaries to make project-related decisions; and (4) providing opportunities to the community to initiate actions for their own benefit.

On the other hand, recommended are four ways that beneficiaries themselves can participate in sector projects, some of which have been tried in the province. These are: (1) the provision of free labor and/or materials by community members; (2) the sharing of costs between project proponent and the users; (3) expressed participation of all parties through MOAs and, (4) the participation through a firm involvement and commitment of the community in the management, operation, maintenance of the system itself.

For Levels I and II, the WATSAN Unit should utilize the recommended Community Development Framework (modified from the UNDP-WATSAN Project) consisting of three phases of activities: Phase 1 is Formation of Organization; Phase 2 is Development of Organization; and, Phase 3 is Consolidation of Organization.

#### Gender Consideration

Since sustainability of WATSAN services depends on responding to the demands of men and women in the community, the Province of South Cotabato must continue to recognize and give vital emphasis on the role of gender sensitive participation in the use, maintenance and financing of WATSAN systems. Thus, special measures must be instituted to give equal voice and opportunities to the men and women in serving the community as well as in the planning, implementation and monitoring and evaluation of sector projects. To ensure the gender responsiveness of WATSAN projects, the province should continue to provide training to its LGUs through a Trainer's Training Program on Gender Responsive Planning as envisioned by the Philippine Plan for Gender Responsive Development (1995-2025).

#### **9. Cost Estimates for Future Sector Development**

The investment cost includes direct cost for construction/rehabilitation of required facilities, procurement of vehicle/equipment, construction/upgrading of laboratory, sector management, physical and price contingencies, and value-added tax. The recurrent cost is incurred for operation and maintenance of facilities. Unit construction cost per person/household/facility was first prepared under contract-out basis in 1997 price level. In this regard, the cost for procurement and distribution of toilet bowl for pour-flush toilets is only counted for household toilets. Investment cost required by phase for the province is summarized in Table 9.1.

Table 9.1 Investment Cost Required by Phase

Unit: 1,000 Pesos

Item	Component	Phase I	Phase II
<i>Construction/ Rehabilitation</i>	<i>Water Supply</i>		
	Urban Area	112,112	721,876
	Rural Area	76,512	287,719
	<i>Sanitation</i>		
	Household Toilet	4,225	8,344
	School Toilet	70,444	189,403
	Public Toilet	3,441	4,817
	Disinfection of Well	2,566	297
	Urban Sewerage	N/A	1,177,775
<i>Sub-Total</i>	<i>269,299</i>	<i>2,390,231</i>	
<i>Procurement of Vehicle/ Equipment/Maintenance Tools</i>	Well Drilling Rig & Service Truck	0	26,782
	Support Vehicle	590	0
	Well Rehabilitation Equipment	280	0
	Maintenance Tools	110	0
	Water Quality Testing Kits	15	0
	<i>Sub-Total</i>	<i>995</i>	<i>26,782</i>
<i>Water quality Laboratory</i>		2,032	0
<i>Sector Management</i>	Engineering Studies	34,250	156,547
	Community Development and Training	21,411	108,379
	<i>Sub-Total</i>	<i>55,661</i>	<i>264,926</i>
<i>Total Direct Cost</i>		<i>327,987</i>	<i>2,681,939</i>
<i>Contingencies</i>	Physical Contingency	32,786	268,194
	Price Contingency	85,276	N.A
	Value-Added Tax (VAT)	30,645	N.A
<i>Total Investment Cost</i>		<i>476,694</i>	<i>2,950,133</i>
<i>Total Investment Cost (excluding Price Contingency)</i>		<i>391,294</i>	<i>2,950,133</i>

The investment cost for Phase I is estimated at about ₱476.7 million. A total of ₱ 269.3 million (in 1997 price level) is required as the construction/rehabilitation cost (including cost for disinfection of well) in Phase I, of which urban water supply and rural water supply share 42% and 28%, respectively. While, the remaining 30% is required for urban and rural sanitation.

Required equipment and vehicle for construction/rehabilitation of Level I facilities and solid waste management are roughly estimated: 1 set/unit each of well drilling equipment and service truck with crane; 1 set/unit each of well rehabilitation equipment and support vehicle; and 11 units of refuse collection truck. The total procurement cost is estimated at approximately ₱ 50 million. Out of the requirements, however, only one set/unit each of well rehabilitation equipment, support vehicle and maintenance tools/water quality testing kits is incorporated in the medium-term investment plan due to budgetary constraints and technical capability of LGUs at present.

Likewise, annual recurrent cost in 1997 price level is estimated at ₱ 23.4 to ₱ 32.9 million/year during Phase I period.