APPENDIX-XIII
Institution

THE STUDY ON SABO AND FLOOD CONTROL
FOR WESTERN RIVER BASINS OF MOUNT PINATUBO
IN THE REPUBLIC OF THE PHILIPPINES

FINAL REPORT

SUPPORTING REPORT

APPENDIX XIII INSTITUTION

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CHAPTER 1 LEGISLATION AND ORGANIZATION

1.1 General

The main aim of this part of the report is to propose an appropriate organizational arrangement for the implementation and subsequent management of the structural and non-structural recommendations in this study. The recommendations focus primarily on (1) flood and mudflow control and (2) river basin management in the Bucao and Sto. Tomas River basins. Current arrangements for river basin management are assessed. In doing this, the relevant enabling legislation and existing institutional structure are briefly outlined and considered. Necessary capacity building measures are proposed.

It is understood that since 1999 the Government have been promoting, through an executive order, improved institutional performance for the executive branches. The study team have not yet been able to assess the success or otherwise of this initiative.

1.2 Law and Regulations

The principal legislation concerning the water sector in the Philippines is the Water Code and its related regulations. The much later Local Government Code which deals with decentralization and the role of LGUs also has an impact on the management and regulation of rivers and flood control although it does not refer to this directly. Both are reviewed in the following paragraphs.

1.2.1 Water Code

The Water Code is the base law regulating rivers and other water courses in the country. It was promulgated through Presidential Decree No. 1067 (PD 1067) on 31 December 1976. In June 1979, the National Water Resources Council (NWRC) now the National Water Resources Board (NWRB) issued "The Implementing Rules and Regulations (IRR)" of the Water Code. The legislation is relatively old and may not be entirely appropriate for present conditions.

The main features of this legislation pertinent to this study are summarized below. Important and relevant issues arising are discussed in section (3) below.

(1) Major rivers

Major rivers are defined as having a drainage area of at least 1,400km^2, of which there are 18 in the Philippines. The Bucao, Maloma and Sto. Tomas River basins have drainage areas of 655, 152 and 262km^2 respectively and so do not qualify as major rivers. It is not clear how this definition decides the responsible agency for managing river basins.

(2) River Administration

The Code initially states that all management of water resources is "subject to the control and regulation of the Government through the National Water Resources Council" but later says that this excepts "those functions which are specifically conferred on other agencies of the government". As other studies have pointed out, the many violations of this Code[1] suggest that the present management arrangement is not effective.

[1] Illegal settlers and therefore cultivation in river areas; illegal water diversion and ground water extraction.

(3) Ownership of Water

Article 5 of the Code says that rivers are owned by the State and implies that their management should be the responsibility of National Government. There is apparently no statement about which, if any, rivers are not under National Government control.

(4) River Area

River area is defined as public land 3 meters from the river bank in urban areas, 20 meters in agricultural areas, and 40 meters in forest area. Furthermore, the river bank is defined as the "line reached by the highest flood". Within this area, nobody is permitted to reside or cultivate land. In practice, however, this provision seems not to be applied, either in physically defining the line of the highest flood, or in preventing settlement and cultivation.

(5) Flood Plains and Flood Control Areas

The Code says that the Secretary of DPWTC, now DPWH, may declare flood control areas as required and may construct flood control structures in these areas. It is reported that DPWH are not aware of any river having such officially designated river areas or flood control areas.

(6) Water Permits and Maintenance Flow

NWRB may give permits to extract water of up to 90% of available water at the point of extraction, which means that 10% is considered adequate for maintenance flow under all circumstances. This may not be so in every case.

1.2.2 Local Government Code

The Local Government Code was promulgated by Republic Act No. 7160 (RA 7160) in October 1991. The aim of RA 7160 is to transfer genuine autonomy to local government[2] and enhance its capacity to undertake the resulting increased responsibility.

RA 7160's main provisions include those concerning:

1) Requisites for creation or modification of LGUs,
2) Basic services and facilities. There are specific provisions concerning the construction and maintenance of flood control and related infrastructure, also irrigation systems, at municipal and provincial level. For the province, provisions refer specifically to inter-municipal systems; for the municipality, inter-barangay systems. This seems a satisfactory arrangement providing sufficient funds are available at each level,
3) Authorities of LGUs, e.g. to negotiate and secure grants,
4) National and provincial government supervision over (and monitoring) cities and municipalities, and municipalities' supervision over barangays,
5) LG relations with people's organizations, NGOs and the private sector,
6) LG planning, budgeting, funding including taxation and credit financing.

In line with the Local Government Code, it is understood that NEDA has been trying to encourage LGUs to implement infrastructure projects such as flood control and other river improvement works. Despite National Government (NG) policy, large scale river improvement projects have generally been undertaken by NG since LGUs have insufficient management and technical capability and funds to perform these works themselves. This is the case in Zambales Province where current investment

[2] Local Government Units (LGUs) are the governments of provinces, cities, municipalities and barangays

programs do not include flood control or river management projects. It also appears, as mentioned in paragraphs 1.2.1(1) and 1.2.1(3) above, that there are neither regulations nor criteria in use to decide which river basins are to be managed by NG and which by LGUs.

1.2.3 NIPAS Act

The National Integrated Protected Area System (NIPAS) Act was promulgated as Republic Act No. 7586 (RA 7586) on 1 June 1992. Implementing Rules and Regulations (IRR) were issued by DENR Administration Order DAO 25 on 29 June 1992.

Concerning NIPAS policy, the IRR state that management and development of protected areas have to ensure conservation of biological diversity. The categories of protected areas include nature reserves, parks, wildlife sanctuaries, protected landscapes and seascapes. The existence of these protected areas in the study area is discussed in Appendix VIII of this report.

1.2.4 Related Environmental Legislation

Legislation related to the NIPAS Act includes:

1) Prohibition of cutting trees in designated forest and especially higher than 1000 meters above sea level;
2) Prohibition of slash and burn agriculture. This seems to be widely disregarded;
3) Network of Protected Areas of Agricultural Development. This is to prevent the conversion of agricultural land to other uses without the permission of Department of Agriculture and the Sanggunian (LGU parliament).

1.3 Organization

1.3.1 Philippine Government

The organization of the Philippine Government is shown in outline in Figure 1.3.1 The government agencies concerned with the management of water resources and with river basin management in particular are, with their main responsibilities:

(1) Department of Public Works and Highways (DPWH)

- Establishment and maintenance of major flood control and drainage facilities,
- Management of water resources by the National Water Resources Board (NWRB), attached to DPWH,
- Raw and treated water supply by Metropolitan Waterworks and Sewerage System (MWSS) and PMO - Rural Waterworks System (RWS), also attached to DPWH, PMO - RWS supplies treated water only; LGUs supply raw water, generally,

(2) Department of Environment and Natural Resources (DENR)

- Watershed management,
- Water quality management,
- River environment management.

(3) Department of Agriculture (DA)

- Agricultural development,
- Establishment of irrigation projects by National Irrigation Agency (NIA), attached to DA.

(4) Department of Science and Technology (DOST)

- Flood forecasting and warning system by Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA), attached to DOST.

(5) Department of National Defense (DND)

- Disaster prevention and mitigation by Office of Civil Defense (OCD), attached to DND,
- National Disaster Coordinating Council (NDCC) led by OCD.

(6) Department of Agrarian Reform (DAR)

- Land acquisition and distribution

(7) Department of Interior and Local Government (DILG)

- Coordinating and supporting LGUs

(8) Corporations, NGOs etc.

- Hydropower by National Power Corporation (NPC)
- Emergency services by Red Cross and other NGOs and private entities.

It is perhaps significant that the words "water" or "river" do not appear in the names of any of the above agencies.

1.3.2 Institutions Concerned With River Basin Management

The management of river basins should include the following tasks:

i) Watershed management (river basin conservation),

ii) Water resources management (development, licensing, allocation, distribution of water resources, billing and receiving payment for water supplied),

iii) Flood control (development of infrastructure, flood forecasting),

iv) River water quality management (water quality monitoring, pollution control),

v) River environment management (river corridor maintenance, river environment land use management),

vi) Water resources infrastructure maintenance (preventive, corrective, emergency maintenance).

Many agencies are reported to be concerned with each of the above aspects of river management. Some of these are listed below under the above task headings. Where possible, this information was sourced from charts issued by NWRB in 2001 which show functional and organizational relationships (see Figures 1.3.2 and 1.3.3) in water resources management.

(1) Watershed Management (river basin conservation)

According to NWRB, the Forest Management Bureau (FMB) is the leading agency with the participation of Bureau of Soils and Water Management (BSWM), NIA, NPC and MWSS. This list

does not include DENR, EMB, or DA, all of which would normally be involved in this area. Moreover, the FMB may not be the appropriate body to lead this important area if it has any responsibility for commercial forestry.

(2) Water Resources Management (development, licensing, allocation, distribution of water resources)

This important area does not appear on the NWRB chart referred to above. However, NEDA and NRWB are said to be the leading agencies with participation by MWSS, PMO-RWS, Local Water Utilities Association (LWUA), Laguna Lake Development Authority (LLDA), (NIA), DPWH, DILG, DA, OCD, PAGASA and LGUs.

(3) Flood Control (development of infrastructure, flood forecasting)

From the NWRB chart, DPWH is the leading agency with participation by two PMOs – for Major Flood Control Project (MFCP) and Small Water Impounding Management Project (SWIM). DPWH undertakes planning, design and construction of flood control facilities, and defines flood control areas. In addition, other agencies are reported to participate, namely

- PAGASA which operates the flood forecasting system and also issues flood warnings to interested agencies and the public,
- OCD which, as the executive agency of the National Disaster Coordinating Council (NDCC), has to ensure, with other agencies such as DPWH, NIA and NPC, that the nation is prepared for flood, that necessary warnings are issued, and that mitigation measures are implemented, and
- LGUs

NWRB is responsible for: providing the regulations relating to rivers, including designating river areas; giving permission to water users; and approving construction of all river-related civil works. There may have been some expansion of these responsibilities along with the recent transfer of NWRB to Office of the President (see 1.3.4 below).

(4) River Water Quality Management (water quality monitoring, pollution control)

The NWRB states that Environment Management Bureau (EMB) is the lead agency, with participation by DOH, and the Environmental Health Service (EHS). MWSS, LWUA and LGUs are also reported to be involved.

(5) River Environment Management (river corridor maintenance, river environment land use management)

This activity is not shown on the NWRB chart. Participants are reported to include DENR/EMB, NWRB, DOH, NHA, MWSS, LWUA and LGUs.

(6) Water Resources Infrastructure Maintenance

This activity is not shown on the NWRB chart, but DPWH would be the leading agency assisted by the relevant units within LGUs to some extent not clearly defined.

1.3.3 The Organization of DPWH

This section outlines the role and organization of DPWH Central Office, DPWH Regional Office in Region 3 and District Offices in relation to river basin management and specifically flood control.

(1) DPWH Central Office

1) Mandate of DPWH

Executive Order No. 124 dated 30 January 1987 established DPWH "as the engineering and construction arm of the Government." As such it was to "develop its technology [to ensure] the safety of all infrastructure facilities and [to secure] the highest efficiency and quality in construction." "DPWH is currently responsible for the planning, design, construction and maintenance of infrastructure, especially national highways, flood control and water resources development system, and other public works in accordance with national development objectives."

The mandate says nothing about operation of infrastructure.

2) Organization Structure of DPWH Central Office

The present structure is shown in Figure 1.3.4 and comprises:

- The core department that includes 6 services (planning, monitoring and information, controllership and financial management, legal and internal audit),
- 5 technical support bureaux (design, construction, equipment, maintenance, research and standards),
- 16 regional offices and about 22 project management offices.

There are two attached agencies – LWUA and TRB – in addition. The NWRB was recently transferred from DPWH to the Office of the President.

Master Plans and Feasibility Studies are the responsibility of Planning Service, usually with the assistance of consultants. Project implementation is undertaken by Project Management Offices (PMOs), the heads of which report to an Assistant Secretary or Under Secretary depending on the project's location.

3) Staffing of DPWH

In June 2002, according to DPWH, the total number of staff overall amounted to some 36,200 (up from 34,800 in 2001), of which the regular staff was about 19,300 or about 53% of the total. The remaining staff were either on contract (944) or casual (14,107) or regular staff charged to Maintenance Fund (1,829). The total number of qualified engineers cannot be easily obtained as staff are apparently only classified by grade and not by discipline.

4) Staffing of Project Management Offices

Also in June 2002, the total number of staff in all PMOs, PMO Clusters and Field PMOs was about 1,400. Each PMO had an average of 62 staff. There were apparently no regular staff in field PMOs: all were either contracted or casual. This may not be an ideal arrangement.

5) Annual Investment Program (2001 to 2004)

From DPWH's Medium Term Public Investment Program (MTPIP), the planned annual investment amount from 2001 to 2004 is shown in the table below.

DPWH: Medium Term Public Investment Program (2001-2004)

(Unit: Million Pesos)

Year	Highways		Flood Control		Others	Total	Annual Increase
2001	21,878		5,347		7,751	34,976	
2002	27,228	(24.7)	7,079	(32.4)	8,311	42,618	21.8%
2003	37,352	(37.2)	7,849	(10.8)	11,282	56,483	32.5%
2004	43,464	(16.4)	8,546	(8.9)	11,330	63,240	12.0%
Total (01 to 04)	129,922	(98.7)	28,821	(59.8)	38,674	197,417	80.8%
Share	65.8%		14.6%		19.6%	100.0%	

Note: Figures in brackets indicate annual percentage increases

The table indicates substantial annual increases in total investment but smaller increases for investment in flood control. Highways received the largest annual increases in both amounts and as percentages of the previous totals. Foreign assistance is planned to fund 52.7% of the 197.4 billion pesos over the four year period.

(2) DPWH Region 3 Office

1) Organization

The organization structure of the Region 3 Office of DPWH is shown in Figure 1.3.5. The office is in San Fernando and has two Assistant Regional Directors (for Areas I and II), 6 divisions, a Regional PMO, a Regional Equipment Service Office, and three support units reporting to the Regional Director. Zambales Province is in Area II. The divisions are:

i) Planning and Design Division,

ii) Construction Division,

iii) Material Quality Control Division,

iv) Maintenance Division,

v) Comptrollership and Financial Management Division,

vi) Administrative Division.

The mandates of these divisions are reasonably self-explanatory. Technical divisions generally work within their authority limits.

In addition, there are 11 Engineering District Offices, including one in Zambales Province based in Iba, the provincial capital, one Engineering Sub-Office in Olangapo, two Area Equipment Services for Areas I and II, and two PMO-PRCSs[3] for Areas I and II. (The two PRCSs are responsible for East Pinatubo river basins only and will have no direct relationship with this project.) These field units report to their respective Assistant Regional Directors according to their area location.

2) Project Authorization

According to DO 60 in 1998, Region 3 Office was authorized to plan and design projects of up to 50 million pesos and to implement projects of up to 30 million pesos. Also, DO 61 in 1998 authorized District Engineers (DEs) to implement projects of up to 15 million pesos.

[3] Pampanga River Control System

These limits to regional and district authority are much less than the cost of either of the projects proposed for GOP by this study (see Chapter 2 Section 2.3 of this Appendix XIII).

3) District Engineer's Offices

The 11 DE offices and one sub-office undertake project implementation and maintenance work on the existing infrastructure. This work is chiefly concerned with national highways and bridges within district authority limits and boundaries. In confirmation, there were 78 infrastructure projects completed in 2001 valued at 189 million pesos, of which only one valued at 2.7 million pesos (1.4% by value) was for flood control. However, 7 maintenance projects for flood control were completed at a cost of 12 million pesos from the District's maintenance fund.

4) Regional Equipment Service (RES)

The RES maintains and provides the heavy and more ordinary equipment required for new construction and maintenance work. If Region 3 equipment is typical, it is old with low working efficiency. As a result, most major road maintenance, for example, is sub-contracted.

5) Staffing

The number of staff in the DPWH Region 3 office at the end of FY 2001 is summarized in the table below:

DPWH Region 3 Office Staffing at end of 2001

Unit(s)	Positions		
	Authorized	Filled	Vacant
Regional Office	210	209	1
Nueva Ejica & Pampanga	186	185	1
Bataan I, Bulacan I, Tarlac, Zambales	275	274	1
Bataan II	42	42	0
Pampanga II, Bulacan II, Nueva Ejica II	120	120	0
Cities	98	78	20
Regional Equipment Service	134	133	1
Area Equipment Services I & II	209	209	0
TOTALS	1,274*	1,250	24

Notes: 1.The Regional Office staffing is analyzed as follows: Regional Director's Office – 18; Planning and Design Divn. – 35; Construction Divn. – 23; Materials Quality Control & Hydrology Divn. – 20; Maintenance Divn. – 41; Controllership & Financial Management Divn. – 23; Administrative Divn. – 52.2. PMO-PRCS I and II are excluded from this table. 3. *Regular staff. In addition, there are 525 casual employees and 114 charged to Maintenance Fund.

The table indicates a remarkably low level of vacancies, except for cities, although this is consistent with a high unemployment rate generally, but normally lower in cities.

6) Annual Budget for 2002

The annual budget for the DPWH Region 3 office in 2002 is summarized in the table below. Region III total includes the regional office, three sub district offices and ten district offices, and the regional equipment service.

DPWH Region 3 Annual Budget (2002)

(Unit: Million Pesos)

Unit	Authorized Appropriations			
	Personnel Service	MOOE	Capital Outlay	Total
Region III	202.42	277.30	184.37	664.09
Regional Office III*[1]	45.78	87.89	79.26	212.93
Zambales DEO	11.42	27.24	4.78	43.43
Zambales SDEO	2.98	8.53	-	11.51
Regional Equipment Service	47.20	4.25	-	51.45

Notes: 1.*[1] Includes Pampanga, Tarlac and Zambales Subdistrict Engineering Offices.
2. MOOE is an abbreviation of Maintenance Organization and Operation. This cost includes sub-contracted operations and casual personnel.

This table shows that the total cost of the Regional Office and three sub-district offices is about 32% of the overall Region 3 cost, a higher proportion than that for personnel which is only 23%. This difference is due to the higher MOOE cost of district offices. Capital outlay for the Regional Office and sub-districts is the highest of the three types of cost as a proportion of total Region 3 cost, at 43%. Thus, in terms of both personnel and MOOE cost ratios, the Regional Office is receiving more than its fair share of capital investment. It should be noted also that the sud-district offices are receiving no capital outlay for 2002. This skewed investment pattern suggests that decentralization to districts, explicit in the Local Government Code, is not being properly implemented.

7) Infrastructure Program for 2002

The following table shows the 2002 program of investment in highways, flood control and other types of infrastructure throughout the region. Zambales Province is subdivided into the Iba (District 1) and Olangapo Districts.

DPWH Region 3 Infrastructure Investment Program (2002)

(Unit: Million Pesos)

Province	Highways	Flood Control	Other Infrastructure	Total
Bataan	40.2	13.8	100.0	154.0
Bulacan	91.5	26.6	200.0	318.1
Nueva Ecija	311.5	2.4	200.0	513.9
Pampanga	101.8	1,079.5	200.0	1,381.3
Tarlac	38.5	208.8	150.0	397.3
Zambales	71.1	14.6	100.0	185.7
- District 1	[13.4]	[13.0]	[50.0]	[76.4]
- District 2	[57.7]	[1.6]	[50.0]	[109.3]
TOTAL	654.6	1,345.7	950.0	2,950.2

Note: Foreign Assistance projected for Highways and Flood Control Projects amounts to P1,743.6 million (about 87% of total investment in these areas or about 59% of total investment.

This program plans to invest about 185.7 million pesos or about 6.3% of total regional investment in Zambales Province, and of that amount about 14.6 million pesos in flood control. Zambales receives the second lowest total infrastructure investment. The equivalent figures for District 1 based in Iba are 76.4 million pesos of total investment of which 1.6 million pesos would be for flood control.

1.3.4 National Water Resources Board (NWRB)

The functions, duties and powers of the NWRB are set out in the NWRC Charter (PD 424 0f 1974), the Water Code (PD 1067 of 1976) and PD 1206 of 1977. Accordingly, the NWRB's main tasks are

licensing of water rights and maintaining the necessary database, water allocation and the compilation of hydrological data, although a previous report[4] has criticized the output quality of this last task. In addition, according to its own statement of its role in the water sector, it is a coordinator and regulator of the various activities in this sector. The NWRB was attached to DPWH administratively but is said to function independently with its own policy-making Board of Directors.

The question which has been asked frequently during the past few years is whether the water sector needs a more powerful and independent management body, nationally and at basin level, at least for major basins. An answer may now be at hand. NWRB was transferred from DPWH to the Office of the President by Executive Order No. 123 signed by the President on 12 September 2002. The order recognizes the need to strengthen NWRB to carry out its mandate of regulating the "utilization, exploitation, development, control, conservation or protection of water resources", and temporarily transferred this body to the Office of the President and amended the Board membership to exclude those with direct claims on water resources. The Secretary of DENR chairs the new 7-member Board.

The EO instructs the NWRB to start a review of the Water Code IRR, and to revise the organization of its secretariat, after which, if approved by the President, the NWRB will be transferred to the DENR. It is not yet known whether this move has been accompanied by an expansion of its responsibilities and authority.

1.3.5 Provincial Government

The structure of Zambales provincial government is shown in chart form in Figure 1.3.6. The government has 12 offices delivering various local government services together with two provincial hospitals, two programs (population and social welfare and development), and the Secretariat to the provincial Sangguniang or parliament.

Among the provincial offices is that of the provincial engineer. This office is staffed by two management level engineers, 10 senior engineers, as well as engineering assistants and draftsmen, and other tradesmen, heavy equipment operators and support staff amounting to some 108 employees in all. As an indicator of their activity, in 2001 the province completed 62 projects, which included the improvement and rehabilitation of roads, upgrading and improving public buildings, hospitals and sports facilities. Projects were reportedly funded from the 20% Development Fund, Trust Fund, General Fund and the 5% Calamity Fund to a total amount of P117.7 million. However, flood control and drainage works were not among the projects reported completed.

The total staffing of the provincial office at the beginning of 2002 was 647 which comprised 48 in senior management posts, 306 in technical, supervisory and trade posts, and 293 in support jobs. This breakdown can be compared with a similar analysis of municipal posts in a table section 1.3.6 below. The 306 employees in technical, supervisory and trade posts include 17 qualified engineering staff at different levels of seniority.

The provincial annual budget estimate for 2002 comprises (a) total income of 350.0 million pesos of which 288 million pesos is funded from the Internal Revenue Allotment, and (b) total expenditure estimated at 349.9 million pesos, leaving a small unappropriated balance of about 100,000 Pesos. The cost of the Provincial Engineering Office is estimated at 40 million pesos, or about 11% of total appropriations.

[4] SAPI Study on Institutional Capability Building in [the] River Sector in the Republic of the Philippines, Final Report, August 1999

1.3.6 Municipal Government

The study area of the three river basins of Bucao (655km^2), Maloma (152km^2) and Sto. Tomas (262km^2), lies within the 8 Zambales municipalities of Botolan, Cabangan, Castillejos, Iba (but only about 33km^2 of it), San Antonio, San Felipe, San Marcelino and San Narciso. Unimportant and mainly small parts of the study area are in the municipalities of Tarlac, Capas, Porac and Subic.

As an indicator of the size and viability of the 8 municipal LGUs, the following table shows the 2002 annual revenue and expenditure budgets of each municipality.

Study Area Municipalities: Revenue & Expenditure Budgets (2002)

(Unit: Thousand Pesos)

Municipality	Revenue			Expenditure			
	IRA	Local	Total	General	Develop-ment	Total	
Botolan	55,500	4,847	60,347	51,414	8,900	60,314	(+33)
Cabangan	20,674	8,803	29,477	28,235	1,242	29,477	(NIL)
Castillejos*	23,534	13,375	36,909	35,903	880	36,783	(+126)
Iba	26,261	19,308	45,569	44,429	1,069	45,498	(+71)
San Antonio	28,452	1,518	29,970	29,114	605	29,719	(+251)
San Felipe*	16,332	2,833	19,164	19,150	0	19,150	(+14)
San Marcelino	28,313	12,843	41,156	41,147	0	41,147	(+9)
San Narciso	19,474	3,416	22,890	22,832	0	22,832	(+58)
TOTAL	218,540	66,943	285,482	272,224	12,696	284,920	(+582)
Non-weighted Average	27,318	8,368	35,685	33,620	1,587	35,615	
% Share	76.6%	23.4%	100.0%	94.4%	4.5%	100.0%	

Notes: Figures in brackets show the budgeted surplus or deficit. *Signifies comprehensive, timely response to the study team's request for data. Due to rounding, individual figures may not exactly equal totals.

As can be seen from the above table, most of the income (an average of 77%) is from the Internal Revenue Allotment (IRA) although the proportion varies greatly between municipalities. San Antonio has the highest proportion of IRA at 95% (or the lowest proportion of locally sourced income) while Iba, Castillejos and San Marcelino have the lowest at 58%, 64% and 69% respectively.

A high proportion of income is allocated to general expenses which include costs of personnel and office operations, and also the 20% Allotment for the Economic Development Fund and a 5% levy for the Calamity Fund. Of the average 4.5% to be used for development, only a small proportion is for minor flood and drainage projects. Botolan's capital expenditure of 8.9 million pesos, for example, is all for equipment and community development. It appears that municipalities rely almost entirely on National Government for infrastructure development in the water sector.

The table below gives the staffing at the beginning of 2002 for each municipality and the provincial government. Vacancies that appear to be funded have been included. As the table shows, the municipalities except Botolan have only an engineering department head and no qualified staff. It could be said that the engineering function is under-represented in the municipalities compared with health and agriculture, for instance. Engineering staff have little if any experience of flood control projects of any size. Regular staff are included in the municipality totals.

Staffing in Provincial and Municipal Governments, Zambales Province

Municipality	Category of Staff					
	Management *[1]	Engineering	Non-engineering	Support	Total	Regular* [3]
Provincial Government	48	17 + (2 in col 1)	289	293	647	187
Botolan	30	3 + (1 in col 2)	43	37	113	16
Cabangan	13	(1 in col 2)	37	52	102	3
Castillejos	23	(1 in col 2)	40	29	92	15
Iba	26	(1 in col 2)	35	31	92	8
San Antonio	26	(1 in col 2)	33	24	83	8
San Felipe	22	(1 in col 2)	28	51*[2]	101	0
San Marcelino	25	(1 in col 2)	51	53	129	25
San Narciso	24	(1 in col 2)	30	31	85	13
Municipal Totals	189	3 + (8 in col 2)	297	308	797	88
Un-weighted Municipalities Average	24	0.4 + (1 in col 2)	37	39	100	11

Notes: *[1] Including about 10 members of the Sangguniang Bayan (Municipal Legislature). *[2] To be confirmed. *[3] Regular staff are included in municipality totals

1.4 Issues

There follows a summary of the main issues identified in this section with some additional material from the SAPI Study. Where necessary for successful project implementation, these issues are the subject of preliminary recommendations in Chapter 2.

1.4.1 Law and Regulation

The major issues concerning the legislation appear to be:

1) Lack of enforcement of the law, and therefore widespread violation of it;
2) The definition of major rivers (and probably other classes of river also) should be linked logically to decisions on whether they should be managed centrally, provincially or locally;
3) Rivers managed by National Government should be specified;
4) From the Water Code, an apparent lack of overall management of the water sector and rivers in particular. NWRB's role in water resources management should be clarified. This is still needed after the recent issue of EO 123 (see Section 1.3.4 above);
5) River areas and flood control areas should be properly defined and the law enforced within the areas defined, or the law should be amended if currently inappropriate.

1.4.2 Organization

The major issues concerning organization, and which have a bearing on the execution of the projects proposed in this study, are summarized in the following paragraphs.

1) It is usual that there are many agencies involved in the various aspects of river basin management. But in the Philippines there appears to be no a suitably empowered body with clear lines of command and responsibility, and adequate authority, for the management of rivers and the water sector in general at the national or regional levels. The same can be said for those major river basins not managed by a river basin development authority. The recent EO 123 transferring the

NWRB to the Office of the President en route to the DENR is a move in the right direction, but other changes are also required.

2) If the NWRB is to continue in its regulatory role and to have additional responsibilities in, for example, setting and/or approving raw and treated water tariffs and is also to have a greater role in the management of water resources, there is a potential conflict of interest involved. Generally, regulatory functions are separated from line management functions for this reason.
3) In Section 1.3.2, some important agencies are omitted from areas of river management in Figure 1.3.3. For example, the absence of either DENR or EMB and DA from watershed management, if a fact, is a significant weakness. Important areas of river management omitted from the same chart include water resources management (NWRB's responsibility) and river environment management.

1.4.3 Project Implementation

It has been noted elsewhere that counterpart funding, both planning and the delivery of funds, for foreign funded projects is often inadequate and acts as a constraint on progress.

In addition, the SAPI Study of 1999 identified some institutional problems and the need for capacity building in the river sector, as follows:

1) Difficulty of land acquisition and compensation, and the apparent lack of standard compensation criteria,
2) Time consuming procedure for approvals generally, partly because of an over-centralized approval and decision making system,
3) Opposition of the community,
4) Lack of resources and authority for the responsible PMO(s),
5) Coordination among the many agencies concerned with river project implementation (already referred to in section 1.4.2 above),
6) Weaknesses in the Water Code and its implementation (already summarized in section 1.4.1 above,
7) Contractor lack of capability, partly due to poor selection procedure.

It is understood that most, if not all, of the above shortcomings still exist. Some could, and should, be remedied in the short term. Others will need major revisions in concepts, legislation and organization, and will require further study before they can be addressed. Preliminary suggestions are made in Chapter 2.

CHAPTER 2 IMPLEMENTATION OF FEASIBILITY STUDY

2.1 Project Implementation

This chapter makes proposals in the following areas:

- River basin management: legislation and organization,
- Project organization, management and relationships with Government institutions,
- Capacity building,
- The community, NGOs and private enterprises, and their relations with the project.

2.2 River Basin Management: Legislation and Organization

Following the issues identified in Chapter 1 section 1.4, certain revisions to the Water Code and its IRR are urgently required and should be implemented in the study Area well before the implementation of the proposed project to avoid problems that would otherwise be encountered. Some of these could be implemented by GOP as part of the instruction in EO 123 to amend the Water Code IRR and include the following.

2.2.1 River Areas, Flood Control Areas and Land Use Regulation

River areas and flood control areas should be clearly designated and enforced. Flood plain land should be based on the hazard map in this feasibility study. These areas should be announced to the public as soon as possible and preferably before project implementation.

The use of the above river areas for settlement and cultivation should be controlled according to the law, and arrangements made to accommodate those inhabitants near rivers who have traditionally cultivated there. Other illegal users of these areas should be resettled.

2.2.2 River Basins: Definition and Management

A system should be agreed for (i) deciding the major river basins and (ii) the agency responsible for managing these and the remaining rivers. It is suggested that the cross-boundary concept is a useful first, and possibly only, indicator. Any river which crosses provincial boundaries would be designated a major river and automatically managed at national level; those crossing municipal boundaries would be managed by the province; all others would be managed by the municipality concerned.

According to this definition, all rivers in the study area would be managed by the Province, even though about 80km^2 of the study area in the north-east is in Tarlac and Capas Provinces in Region 2.

River (basin) management should encompass the six main functional areas[5] as set out in Chapter 1 of this Appendix XIII. This should apply to all rivers whether managed nationally or by LGUs, as defined above. Under this concept (already practiced in some other countries) overall policy making responsibility for river management would be with a national department (previously DPWH, now the

[5] 1) Watershed management (river basin conservation); 2) Water resources management (development,licensing, allocation, distribution of water resources, billing and receiving payment for water supplied); 3) Flood control (development of infrastructure, flood forecasting); 4) River water quality management (water quality monitoring, pollution control); 5) River environment management (river corridor maintenance, river environment land use management); 6) Water resources infrastructure maintenance (preventive, corrective, emergency maintenance).

office of the President, in the future, DENR very probably) and execution nationally and regionally by a dependent agency with considerable powers. The NWRB is well placed to take on such executive responsibility and this would provide the framework for unified river (basin) management which is needed. Considerable organizational change would be necessary, however.

2.2.3 Relocation / Resettlement

Any relocation or resettlement of people required by the project or by implementation of the defined river areas and flood control areas, should be undertaken by LGUs, but with financial and possibly technical assistance from National Government. If not already available, standard criteria and procedures should be prepared for the relocation of (i) people with title to land and therefore to compensation, and (ii) squatters. This should be done together with a careful review of the relevant legislation.

2.2.4 Local Government Code and LGU Capacity Building

As reported earlier, the purpose of the Local Government Code is to promote the role and autonomy of LGUs. In river management, and more specifically flood control, LGUs will require additional capacity in terms of personnel, expertise and funds so that they can undertake flood control projects and their subsequent maintenance. To promote this increased decentralization, LGUs should be involved in project implementation (as is proposed in section 2.3 below) and should contribute some small share of the cost. In this way, they would be building capacity and at the same time helping to defray project cost.

2.3 Project Organization and Management

2.3.1 Selected Projects

The projects selected for the feasibility study are multi-sectoral. Project components and the proposed responsible agencies (the lead agency is stated first in each case) are:

1) Structural measures which comprise:

- For Bucao River:
  - Dike heightening / revetment (cost P0.981bn): DPWH, NWRB,
  - Bridge reconstruction (cost included above): DPWH,
- For Sto. Tomas River (DPWH, NWRB):
  - Dike heightening / revetment (cost P1.678 billion);

The following measures proposed in the master plan for Maloma River may be implemented by DPWH as a separate project.

- Channel work and dike construction (cost P1.960 billion): DPWH, NWRB,
- Bridge reconstruction (cost included above): DPWH;

It may be appropriate for these components to be implemented with the other feasibility study components. This has been assumed in the proposed structure for project implementation. If decided otherwise, the Maloma River component would simply be removed from the project organization.

2) Non-structural measures, which comprise:

- Improvements to provincial / municipal level flood forecasting / warning and evacuation system (cost P85 million): PAGASA, R/P/MDCCs,
- Community-based forest management (cost P76 million): FMB, DENR, LGUs,
- Pilot project for agricultural development on lahar high water channel area on Bucao river (cost P10 million): DA, DENR, NWRB, LGUs,
- Community road rehabilitation (cost P189 million): LGUs, DENR,
- Establishment of Aeta assistance station (AETAS) (cost P15 million): LGUs, NCIP, DENR, NGOs.

The last two items were added during the feasibility study.

2.3.2 Project Organization Structure

(1) Overview

As shown above, the recommended project components are in two distinct categories: structural and non-structural. Structural components are an order of magnitude more costly than the non-structural components and, moreover, belong clearly to DPWH as the lead agency. Non-structural components are multi-sectoral and local, with a heavy community bias, and this feature is reinforced by the two components added during the feasibility study. It is therefore considered appropriate that these components should be managed at the provincial level.

Because of the relatively large size and cost of the structural project components, DPWH, through its Region III office, would undertake implementation of the two components assisted by foreign consultants as determined. It is assumed in proposing this structure that the feasibility study components would be managed in an integrated fashion and not as separate entities.

In line with the intentions of the Local Government Code, LGUs should be involved as far as possible, and if funds permit should contribute a modest amount to the cost. They should participate particularly in the lahar agricultural development and forest management projects. They should also undertake land acquisition for ROW purposes where this is needed.

The DPWH would undertake the lead role and would be accountable for the successful implementation of the project. As such, DPWH would provide the necessary policy framework, administrative and financial systems, and the technical supervision required. As this project is multi-disciplinary, the participation of other national and regional agencies is required to implement non-structural components. However, the DPWH's present separation of foreign currency and local currency project implementation[6], and the existence of the DPWH's Mount Pinatubo Emergency Project Management Office (MPE-PMO), a unified[7] project management office (PMO) located in Region III and responsible currently only for DPWH components, appear to rule out a multi-sectoral PMO responsible for all components. Moreover, this practice seems to contradict the Department of Budget and Management (DBM)'s instruction[8] which says that unified PMOs should include other agencies' sub-projects.

[6] Although this partition appears to be weakening, at least for high cost local currency projects.
[7] A unified PMO, according to the latest Department of Budget and Management (DBM) definition, has a consolidated structure and the necessary resources to oversee, operate and ensure efficient and effective implementation of all development projects in an implementing agency. This instruction is intended to reduce the number of independent PMOs in each agency
[8] National Budget Circular No. 485 "Rationalization of Project Management Offices" dated 13 March, 2003.

The project should be managed by a Project Coordination Committee (PCC), an arrangement that can accommodate sub-projects in different sectors, with different funding sources and implementation periods. This model is widely used in the Philippines. (The formation of a commission or an authority is more appropriate for major complex, long term projects needing much interaction between the components).

Members of the PCC would consist of either national directors or senior Region III representatives of the main agencies concerned – in this case DPWH, DENR, NWRB, PAGASA, DSWD, DA, FMB and the relevant LGUs. National and Region III Disaster Coordinating Councils should also be represented. Members should be selected by the respective agencies.

As already mentioned, DPWH would have overall responsibility for the project, the PCC reporting to the DPWH Secretary in Manila. The Secretary and an Undersecretary (or their delegates) would act as the PCC Chairman and Deputy Chairman respectively.

Two models for project implementation are presented here: 1) Under the currently operated separation of DPWH's PMO from those of other agencies, and 2) using an integrated unified MPE-PMO (or similar) in accordance with DBM's recent instruction. Model 1) is essentially practical: it can operate immediately according to existing DPWH practice. Model 2) is a desirable simplification structurally at the same time requiring the unified PMO to perform a more complex management task. The two models are outlined in paragraphs (2) and (3) below.

The main tasks of the PCC should include review and approval of implementation plans and budgets supplied by the PMOs (Model 1) or single PMO (Model 2), and the later review and control of implementation progress to meet completion deadlines and quality targets within budget. More detail is given in paragraph (2) below.

(2) Model 1: Current Project Implementation with MPE-PMO

Figure 2.3.1 outlines a proposed project implementation structure using the unified MPE-PMO to project manage the two structural components of the project only.

There would be two complementary sources of control for each project component.

Firstly, technical, financial and administrative management would be provided by PMOs, (preferably using systems compatible with those of DPWH) assisted as necessary by consultants, as follows:

1) For the foreign funded structural components in Bucao and Sto. Tomas rivers, from the unified MPE-PMO. This "sub-PMO" could, it is estimated, be staffed from MPE-PMO's own substantial staff resources under an additional expense code;

2) For the locally funded structural components in Maloma River (if implemented as part of the feasibility study project) also from the MPE-PMO[9]. This component would be too large (at about P1.3 bn), for the Region III PMO (until recently the Mount Pinatubo Rehabilitation PMO) to implement[10].

3) For the three non-structural components, the flood forecasting & evacuation system, community-based forest management, and pilot agricultural development on lahar in Appendix IX, sub-PMOs would established by the three project executing agencies (PEAs) concerned, which are, respectively, PAGASA, FMB and DA. Each sub-PMO would include representatives from the other agencies contributing to each component. Thus, the PAGASA sub-PMO would also contain

[9] This arrangement was suggested by the OIC-Project Director from MPE-PMO, who also proposed national (as opposed to regional) agency representation on the PCC.
[10] The implementation authority of the Region III Director is currently limited to P30 million.

members from Region III DSWD and Region III Disaster Coordinating Council, the FMB sub-PMO would also contain members from Region III DENR and the relevant LGUs, and the DA sub-PMO would also contain members from Region III DENR and relevant LGUs.

Secondly, the PCC would perform a high level coordinating role, helping to ensure that the project is implemented as an integrated whole according to approved cost budgets, schedules, and quality standards. To achieve these objectives, the PCC would review plans, budgets and progress against these, suggesting and authorizing change where this is justified. It would not interfere in the day-to-day running of project components unless clear instances of incompetence were revealed by reports of substandard performance. Secretariat support to the PCC would be provided by MPE-PMO.

To assist the PCC's senior and busy members, a small Working Group attached to the PCC should be established. The WG would contain, *as needed by the PCC*, additional staff from each agency to undertake the more detailed analysis and support required by the PCC for each project sector. In particular, the WG should contain representatives from LGUs and the communities affected at the four or five project locations, to help plan and execute a community consultation program (recommended in Section 2.5 below).

The advantages of this structure are primarily:

1) Project management by an existing experienced PMO according to DPWH's current practice. Therefore little institutional or procedural change would be needed.

2) Agreement with some of the latest instruction from DBM on unified PMOs.

The disadvantages of the structure include:

1) Inability of the MPE-PMO to manage an integrated multi-sectoral project with one PMO. Despite this, informal links are apparently maintained with other agency PMOs on multi-sectoral projects;

2) Because of the present official allocation of only foreign currency projects to MPE-PMO, large local currency projects or project components have no official location within DPWH unless Region III's existing implementation authority is greatly increased from current levels, or the MPE-PMO is officially authorized to manage major local currency projects;

3) There seem to be anomalies in the DPWH management of MPE-PMO and Region III projects at Assistant Secretary level. Specifically, the Assistant Secretary responsible administratively for MPE-PMO appears only to deal with project study and not MPE-PMO's project implementation activities. Another Assistant Secretary with other line responsibilities is in charge of all project implementation;

4) The structure does not fully comply with the DBM's latest instruction on unified PMOs.

(3) Model 2: Future Improvements to Project Implementation Organization

To obtain a more streamlined structure and increase the advantages of MPE-PMO as a unified PMO according to DBM's instruction, the disadvantages above should be reduced or eliminated. It is recognized that a greater degree of integration at the PMO level would result in a more complex management role for PME-PMO.

A suggested structure for a more integrated management of the project is illustrated in Figure 2.3.2.

In this case, the PCC will have less responsibility for detailed coordination of the various sub-PMOs as this task will be performed by the wider-ranging MPE-PMO. Therefore there is now no need for a PCC Working Group. The PCC's responsibilities and membership should remain as for Model 1.

Furthermore, the DPWH top management structure should be rationalized to ensure that only one senior DPWH officer at Assistant Secretary level has line responsibility for all MPE-PMO's project management activities.

The role of MPE-PMO would expand to include the management of sub-projects that are under the overall technical, financial and administrative control of other project executing agencies (PEAs) supported by associated agencies in related functional areas.

For example, day-to-day management of the project component dealing with flood forecasting, warning and evacuation system would become the responsibility of the MPE-PMO. The management of technical matters, costs and budgets would be part of MPE-PMO's tasks, and would normally be under an official from the PEA – in this instance PAGASA inside the PMO. Back-stopping technical advice would be provided on demand from the PEA's nearest office – in Region III if there is a presence there – or from its central office in Manila. PEAs would be required to follow MPE-PMO project management and reporting procedures.

The MPE-PMO should be able to manage both foreign and local currency projects.

Functions of the multi-sectoral PME-PMO would include[11]:

- Project planning (detailed specification, planning and scheduling of objectives, tasks, outputs, resource needs, performance measures),
- Monitoring and evaluation (physical and financial progress tracking and assessment, identification of problem areas and remedial measures),
- Project coordination (assisting the PCC with overall project supervision and inter-agency and inter-component harmonization and coordination,
- Project operation (implementation of project components, including decision-making in technical, financial and administrative matters,
- Financial management (budgeting, accounting, cash management and internal audit),
- Coordination with the various stakeholders,
- Provision of a Secretariat for the PCC.

If the multi-sectoral MPE-PMO were, for any reason, disbanded as a unified DPWH Region III PMO, it would be replaced by a similar Region III-based unit with a different geographical jurisdiction. This unit should eventually be responsible to the Region III Director and be funded either from the regional budget, or from a combination of regional and central government funds channeled through regional government.

2.4 Capacity Building Measures

From the experience of the study team, a wide ranging program of capacity building measures will be necessary to help ensure the success of both project implementation and post-construction operation and maintenance.

These measures should include:

1) Revision of the arrangements for river basin management as outlined in section 2.2 above as soon as possible. This will require a major change to current practice and will probably need extended assistance from suitably experienced national or international advisors;

[11] Based on the DBM National Budget Circular No. 485 dated 13 March 2003.

2) Revision of the Water Code and its IRR as outlined in section 2.2;

3) A comprehensive program of personnel training and development for all agencies involved in the project and in particular: DPWH Region III technical divisions, and the engineering units in Zambales provincial office and Iba district office. This should start with a review of all staff and management capabilities and an assessment of their training needs during and after project implementation. The program would therefore need to be spread over the life of the project and beyond.

Training should be a combination of (i) formal classroom training programs administered by either regional, national or international institutions as considered appropriate, and (ii) on-the-job training for specific tasks, groups of tasks or whole jobs. All training, with rare exceptions, should be located in the study area or in Region III. External trainers, with equipment and facilities if necessary, should be imported for the purpose.

PMO staff should be especially targeted for training on technical, project management and community relations matters;

4) To speed project approvals, specific delegation for particular types of approval should be implemented accompanied by the necessary procedural changes, training and development, and monitoring. Specific delegations (strictly, assignment of authority) to assist the project should be extended over time to a wider range of decisions and approvals.

5) Local counterpart funding for foreign-funded projects should be realistically budgeted, so that the funds are available when needed. As noted in Section 1.4.3, the absence of timely local funds is a major cause of delays in foreign-funded projects.

6) Standard criteria should be employed for the pre-qualification of contractors, and should include:

- Suitable past experience of similar projects – not less than two;
- Sufficiency of financial, engineering, construction and management resources;
- Proof of the above by certificates or other reliable documentation.

Decisions on pre-qualification should be taken strictly according to the results of applying the criteria.

2.5 Relations with the Community and NGOs

An issue common to most projects is opposition by one or more groups of powerful stakeholders. In the case of water resources development and specifically flood control projects of which there have been many in the Philippines, opposition by the community has been a main cause of delays and frustration for project managements. In this connection, the SAPI Study (see Section 1.3.4) found that public opposition was caused by:

1) Insufficient knowledge of the project and its objectives, methods, etc.,

2) Inadequate attempts by LGUs and National Government to inform communities of planned changes,

3) Poor arrangements for relocation.

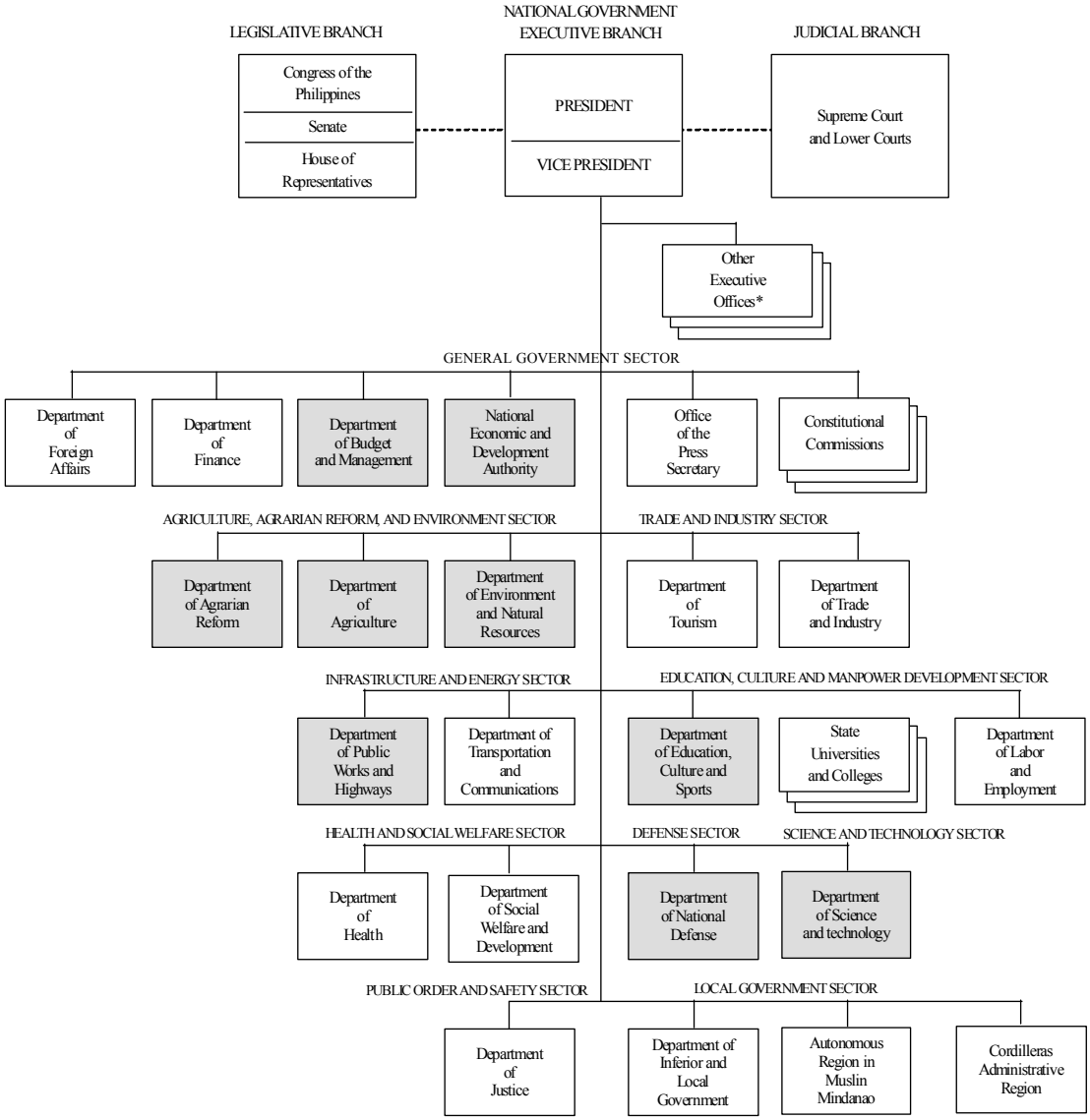
To remedy these weaknesses, the following actions are required to build community awareness and ensure participation. The community will include commercial and other private interests as well as residents.

As soon as can be arranged, community representatives, from municipality, barangay and the grassroots level, should be involved in the planning, design, construction and operation of the project and its components. A comprehensive program of actions to inform and consult with the community should be prepared with the above participants as part of the project. These actions would include:

1) Open public consultation meetings where all main project features would be presented and discussed. These would be led jointly by LGUs and PMO personnel;
2) Interviews with key members of communities;
3) Srveys and questionnaires to obtain the widest range of opinion
4) If the project or any components are likely to generate opposition, focus groups of community representatives should be formed in each basin where problems might xist. The job of these groups would be to consider objections, discuss these in depth with project leaders via workshops, and thereby generate solutions to problems raised.

This program should be led by the government agencies leading the various project components, assisted by LGUs and advisors as appropriate. Relevant NGOs should also be brought into the consultation process, especially those enjoying good relations with the targeted communities. It is suggested that the three river basins should be targeted separately, the major effort going to Bucao and Sto. Tomas where most structural work is to be undertaken.

Figures



* Other Executive Offices

1. Commission on Phillippinos Overseas
2. Commission on Population
3. Commission on Privatization
4. Cooperatives Development Authority
5. Energy Regulatory Board
6. Games and Amusement Board
7. Government Corporate Monitoring and Coordinating Committee
8. Housing and Land Regulatory Board
9. Housing and Urban Development Coordinating Council
10. xxxxx Special Development Authority
11. Movie and Television review and Classification Board
12. Metropolitan National Authority
13. National Commission on the Role of Philippino Women
14. National Computer Center
15. National Intelligence Coordinating Agency
16. National Security Council
17. National Statistical Coordination Board
18. National Stand Farm
19. Office of Energy Affairs
20. Office of Muslim Affairs
21. Office of the Northern Cultural Communities
22. Office of the Peace Commissioner
23. Office of the Southern Culturral Communities
24. Philippine xxxx Commission
25. Philippine Racing Commission
26. Philippine Sports Commission
27. Presidential Commission on Culture and Arts
28. Presidential Commission on Good Government
29. Presidential Commission for the Urban poor
30. Presidential Committee on the Philippine Nuclear Power Plant
31. Presidential Council on Youth Affaires
32. Presidential Legislative Liaison Office
33. Presidential Management Staff
34. Securities and Exchange Commission
35. Videogram Regulatory Board

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Figure 1.3.1

Organization Chart of the Philippine Government

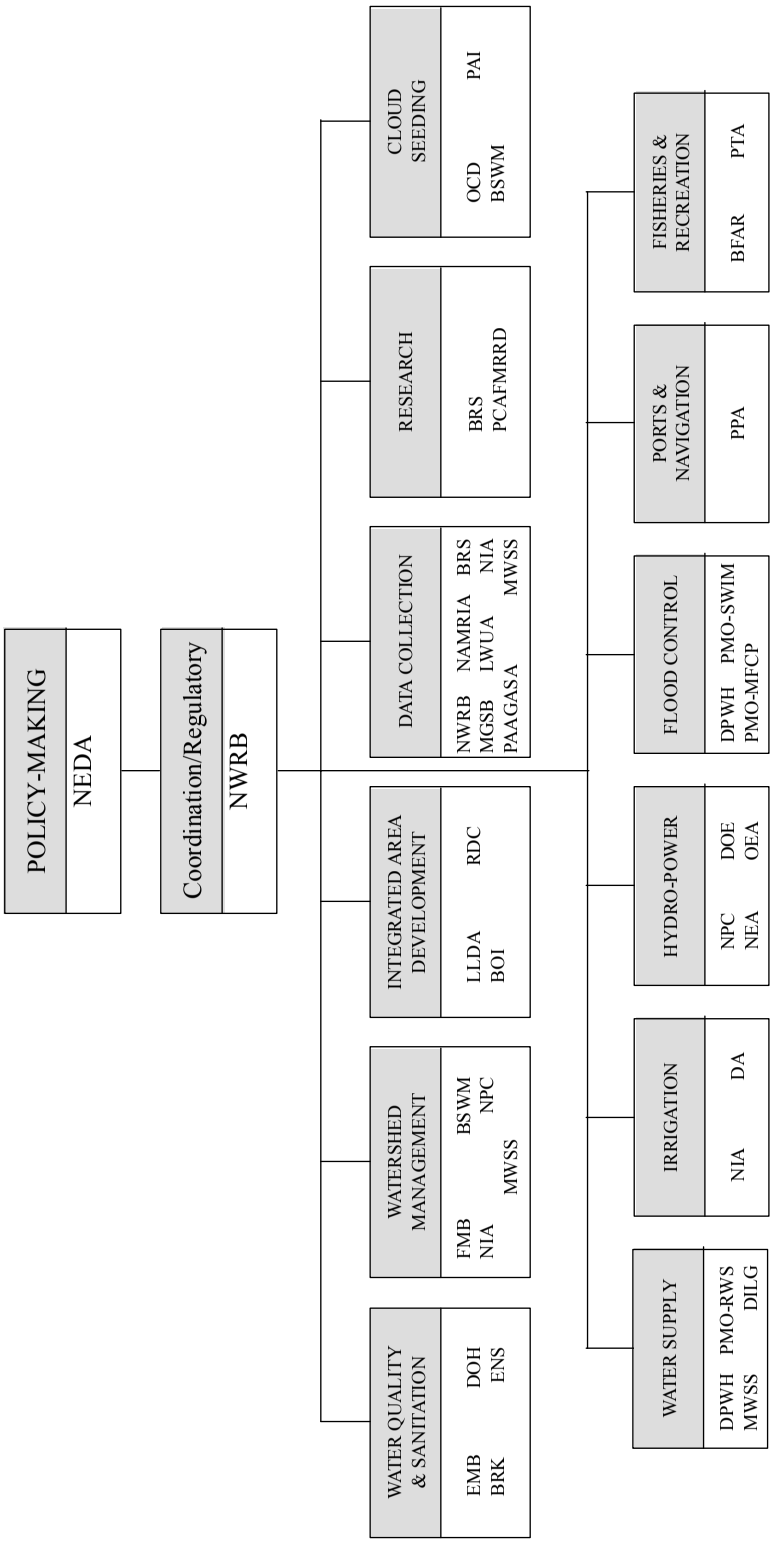

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Figure 1.3.2

Functional Relationship for Water Related Activities

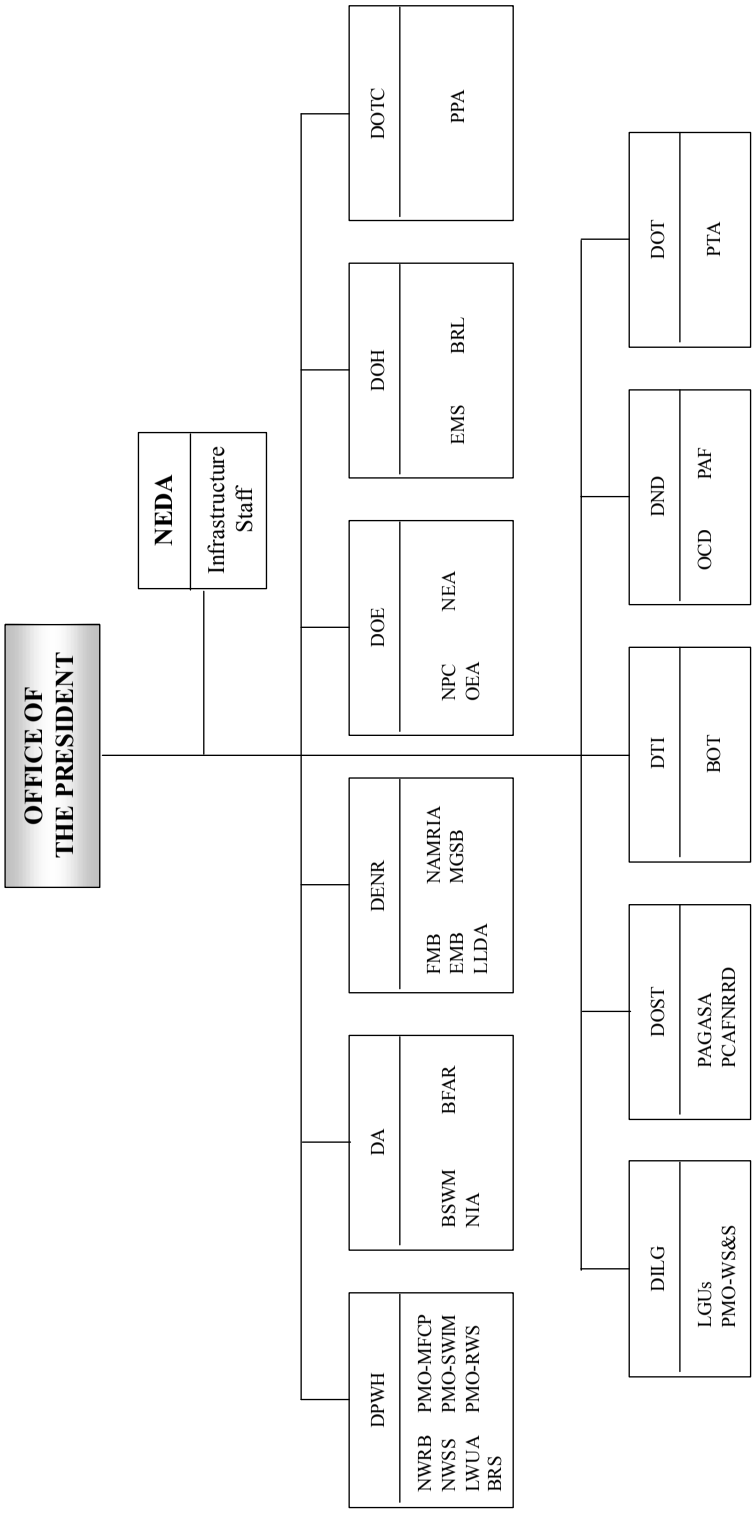

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Figure 1.3.3

Organizational Relationship for Water Related Activities

Figure 1.3.4

Department of Public Works and Highways Organization Chart

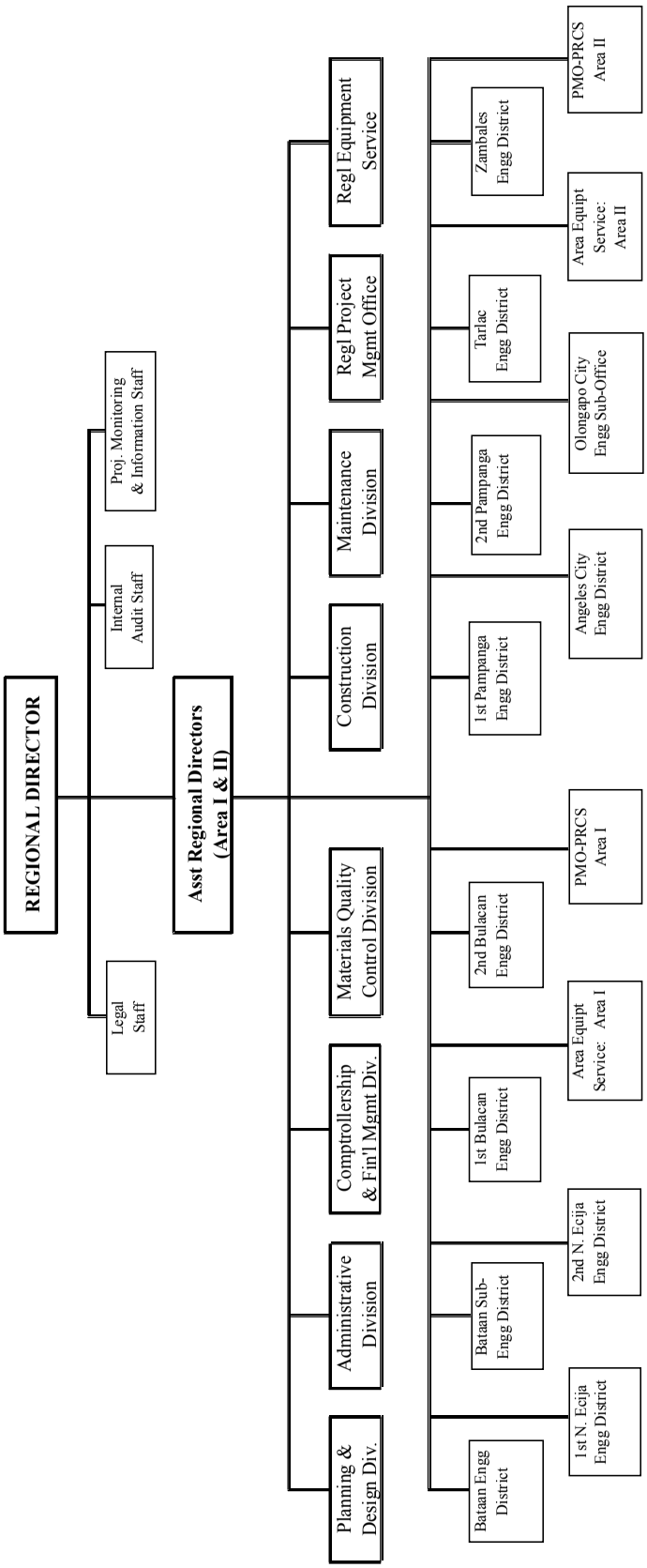

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Figure 1.3.5

Department of Public Works and Housing - Region III

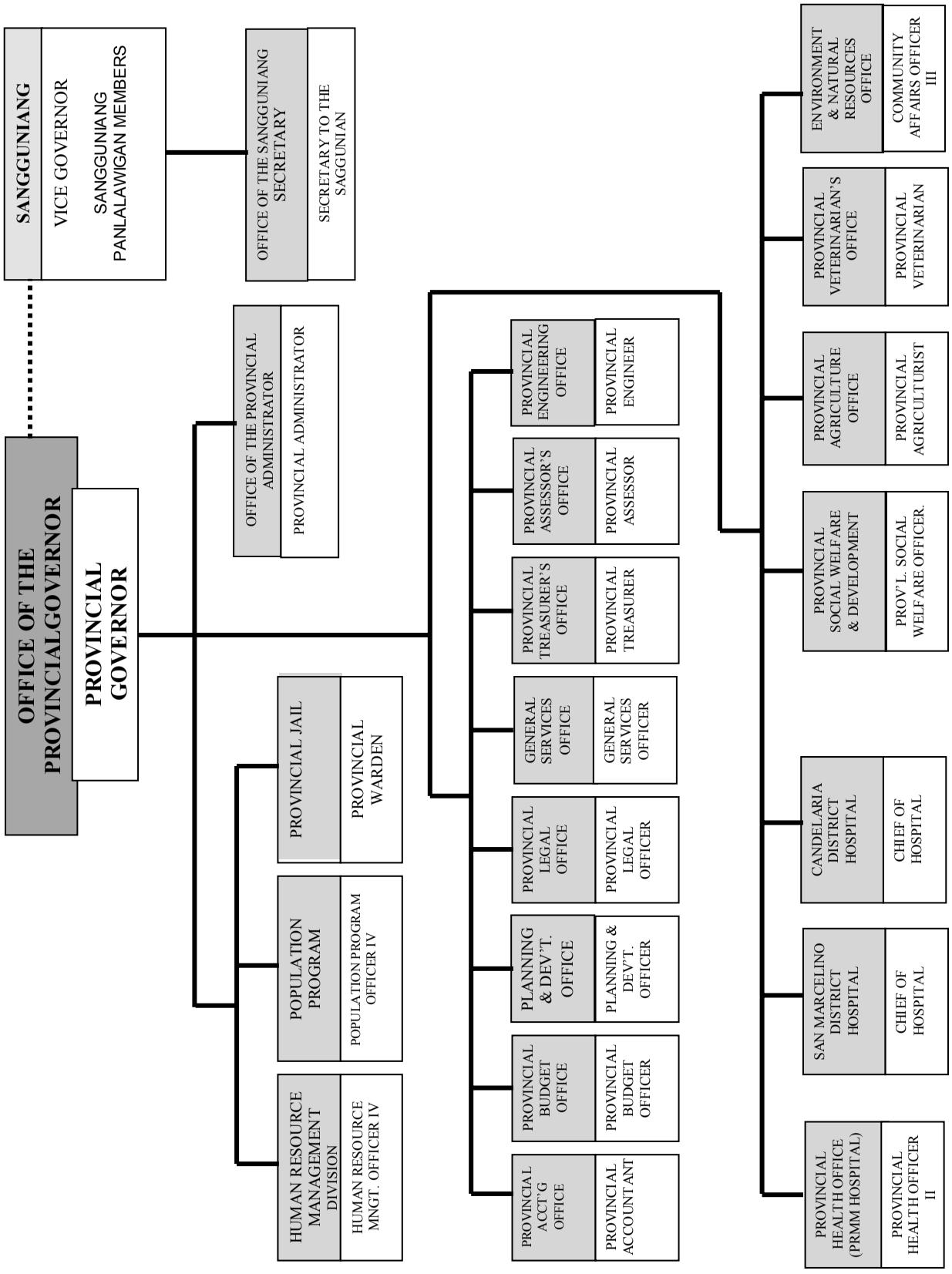

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Figure 1.3.6

Organization of Zambales Provincial Government

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Figure 2.3.1 (1/5)
Proposed Organization for Implementing Priority Projects with present MPE-PMO Responsibilities

Notes: 1. Consultants would support the PCC, WG and all project sub-PMOs.
2. Lightly shaded boxes indicate agencies, offices, groups or individuals directly responsible for project implementation
3. Darker boxes indicate the three main implementing bodies: PCC (coordination), MPE-PMO (management of structural components), and Zambales Province W. Pinatubo PMO (management of non-structural components)
4. It is assumed that local currency funds will be available to implement the Maloma River project alongside the Bucao and Santo Tomas components.

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Figure 2.3.1 (2/5)

Proposed Organization for Implementing Priority Projects with present MPE-PMO Responsibilities

Notes: 1. Consultants would also support the following project sub-PMOs: 1) MPE-PMO (for Bucao & Santo Tomas rivers component + Maloma River component together); 2) PAGASA; 3) FMB; 4) DA.
2. Lightly shaded boxes indicate agencies, offices, groups or individuals directly responsible for project implementation
3. It is assumed that local currency funds will be available to implement the Maloma River project alongside the Bucao and Santo Tomas components.

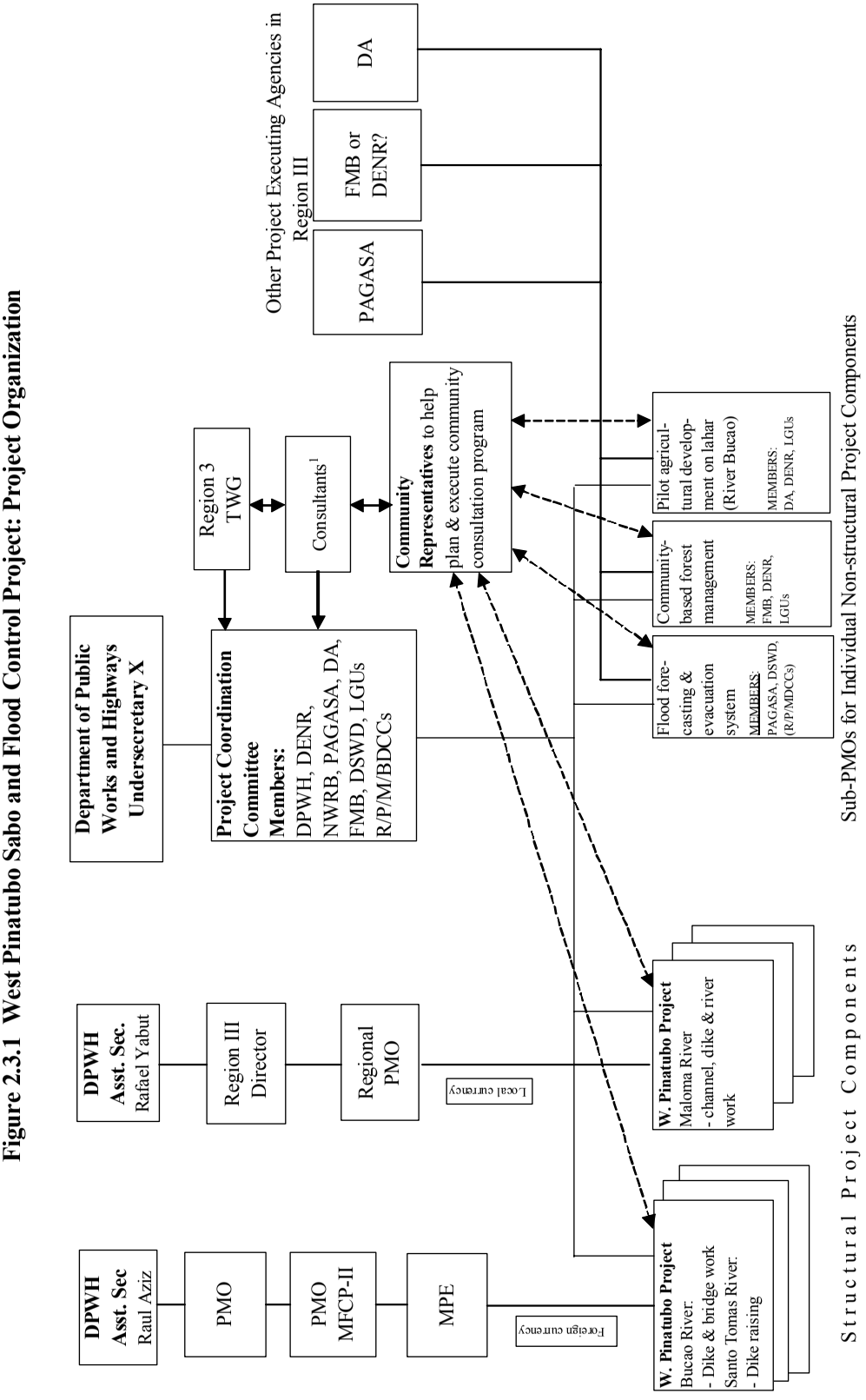

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Figure 2.3.1 (3/5)

West Pinatubo Sabo and Flood Control Project: Project Organization

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Figure 2.3.1 (4/5)

West Pinatubo Sabo and Flood Control Project: Project Organization for Implementing Priority Projects

Notes: 1. Consultants would also support the following project sub-PMOs: 1) MPE; 2) Region 3; 3) PAGASA+DSWD+R/P/MDCCs; 4) FMB+DENR+LGUs; 5) DA+DENR+LGUs

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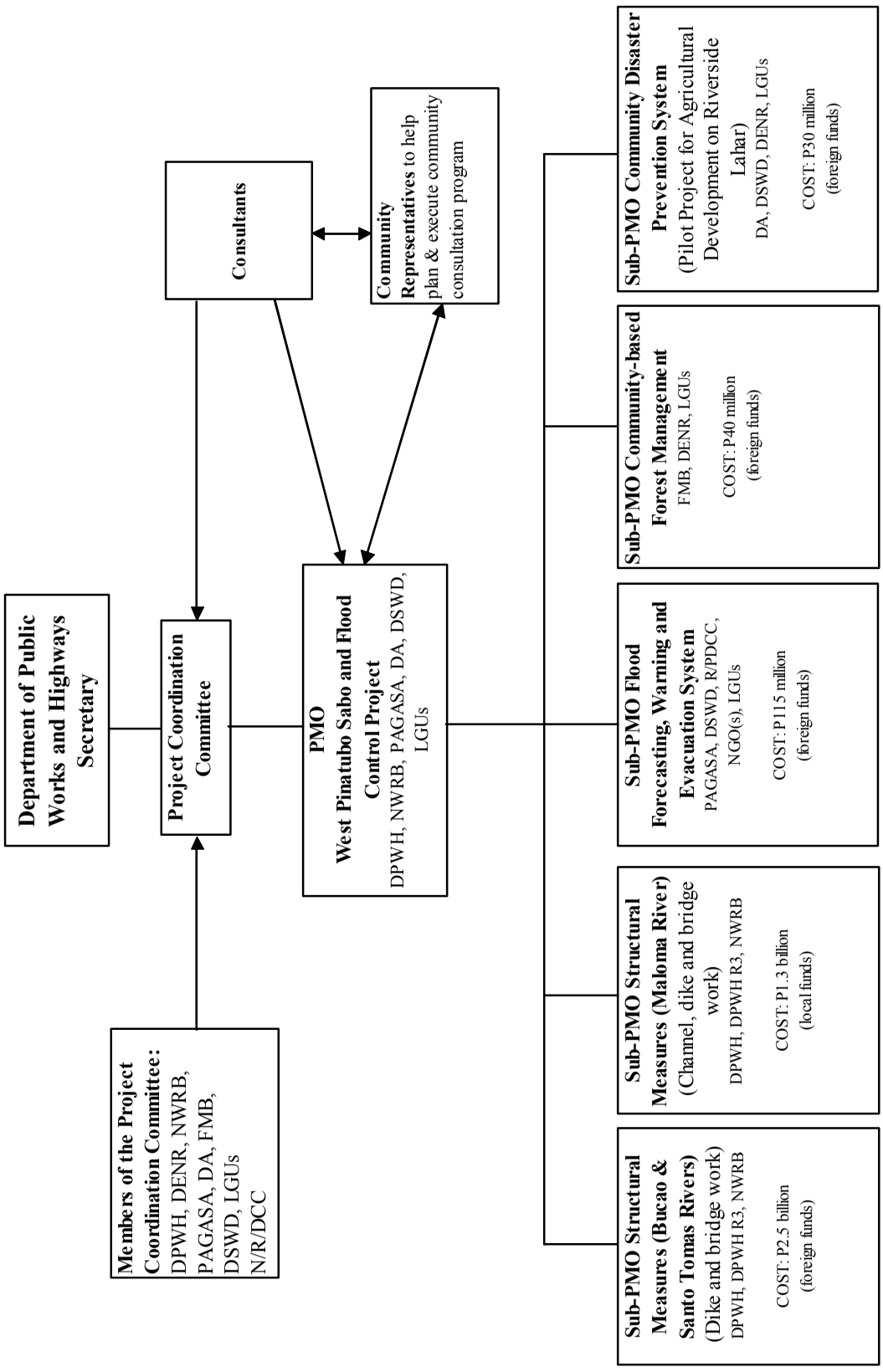
Notes: 1. Consultants would also support the following project sub-PMOs: 1) MPE-PMO (for Bucao & Santo Tomas rivers component + Maloma River component together); 2) PAGASA; 3) FMB; 4) DA.
2. Shaded boxes indicate agencies, offices, groups or individuals directly responsible for project implementation
3. It is assumed that local currency funds will be available to implement the Maloma River project alongside the Bucao and Santo Tomas components.

Figure 2.3.1 (5/5)
West Pinatubo Sabo and Flood Control Project: Proposed Organization for Implementing Priority Projects with MPE-PMO



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The Study on Sabo and Flood Control for Western River Basins of Mount Pinatubo in the Republic of the Philippines

JAPAN INTERNATIONAL COOPERATION AGENCY

Figure 2.3.2 (1/2)

West Pinatubo Sabo and Flood Control Project: Proposed Organization for Implementing Priority Projects without MPE-PMO

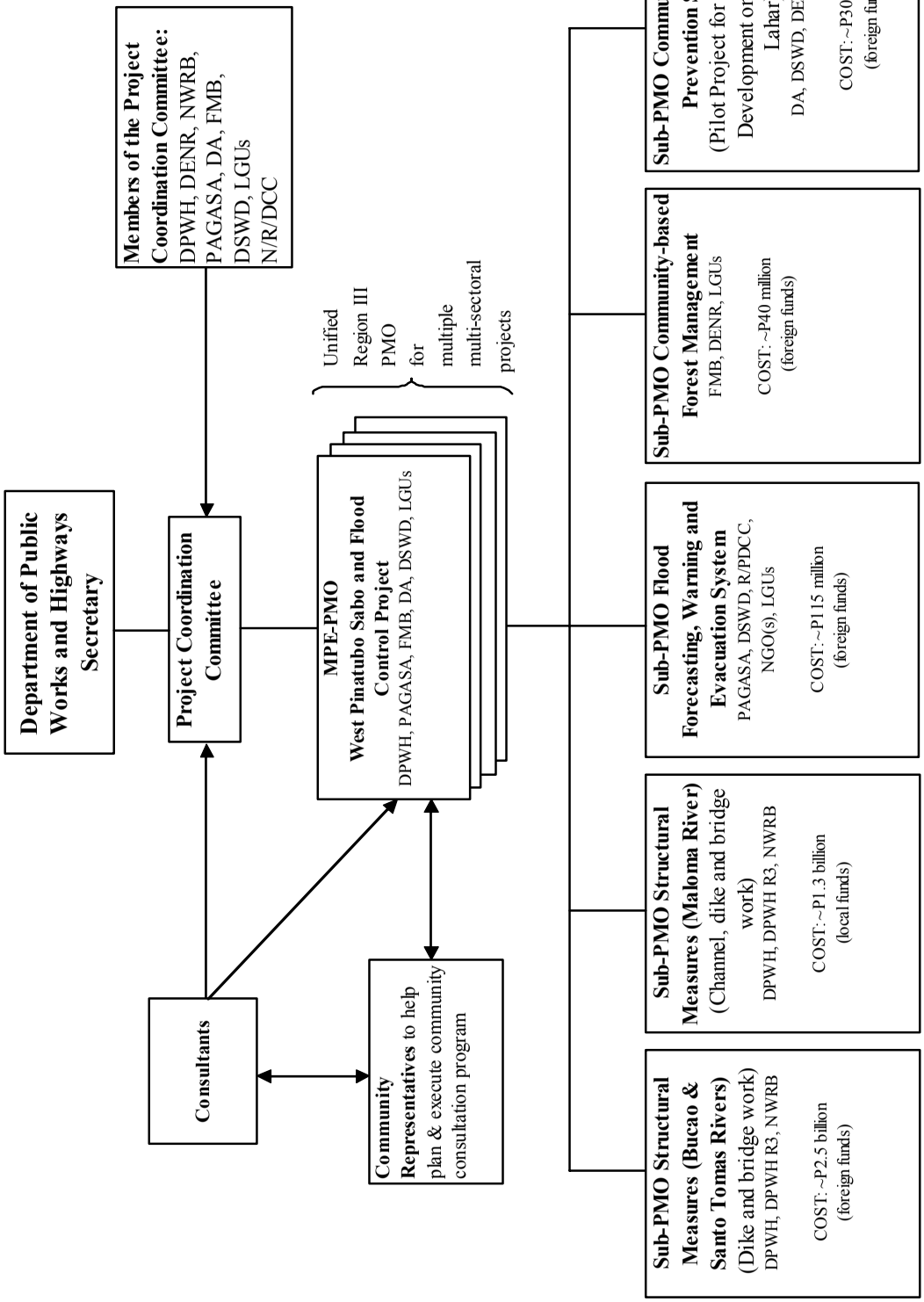

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Figure 2.3.2 (2/2)

Proposed Organization for Implementing Priority Projects with MPE-PMO as Multi-sectoral Unified PMO