

*The Feasibility Study of the Flood Control Project for
the Lower Cagayan River in the Republic of the Philippines
Final Report
Supporting Report*

ANNEX XI : INSTITUTION

THE FEASIBILITY STUDY OF
THE FLOOD CONTROL PROJECT FOR THE LOWER CAGAYAN RIVER IN
THE REPUBLIC OF THE PHILIPPINES

FINAL REPORT

Volume III-2 SUPPORTING REPORT

ANNEX XI INSTITUTION

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CHAPTER 1 GENERAL

1.1 Basic Approach to Institutional study

(1) Objectives

The main objective of the institutional study is to propose an implementing structure of the river basin development of the Cagayan specifically the following.

- 1) Water Resources Development Master Plan, which is to be presented by this JICA Study as a Reviewed Master Plan (Original one is the 1987 Master Plan)
- 2) Lower Cagayan Flood Control Project, which is the main objective of the Feasibility Study to be conducted by this JICA Study.

(2) Basic Strategy of the Philippine Government

With regard to the institution, the Philippine Government issued Executive Order No.165 (EO No. 16) on October 19, 1999 aiming at formulating an Institutional Strengthening and Streamlining Program for the Executive Branches of the Philippine Government. The objectives of the EO are given below referring thereto.

- a) Define the role, scope, level, and focus of government intervention
- b) Delineate spectral activities among the government, business sector and civil society
- c) Achieve proper distribution of functions
- d) Eliminate unnecessary duplication, proliferation and overlapping of agency functions
- e) Strengthen organizational, financial and manpower support
- f) Improve service delivery system
- g) Strengthen standard organic support services

DPWH as well as all other line agencies are conducting the study on the above. The JICA Study Team requested the Steering Committee to provide the Team with the results of the said study. However the final features are not realized yet. The Study Team is conducting an institutional study taking into consideration the above government strategy.

1.2 Scope of the Institutional Study

The institutional study covers the study on current institutions and the problems involved therein in terms of a) Law and Regulation relating to water resources development particularly flood control, b) Organization of the related agencies, and c) Budget thereof.

This Chapter presents the results of the study on the present situation of these aspects, their current problems involved therein, and preliminary recommendations / suggestions on these matters.

CHAPTER 2 PRESENT INSTITUTION

2.1 Water-Related Law and Regulation

2.1.1 Water Code and Related Regulations

Water Code of the Philippines is a basic law on water and rivers in the country. This was promulgated under the Presidential Decree No. 1067 (PD 1067) on 31 December 1976). Prior to this PD, NWRC (now NWRB) published “Principal Rivers in the Philippines” (October 1976). Following the promulgation of PD 1067, NWRC issued “The Implementing Rules and Regulations (IRR) of the Water Code” in June 1979.

Hereunder, major points of these Law and Regulations are discussed.

(1) Major Rivers in the Philippines

There are 421 principal river basins in the country with their drainage areas varying from 42 km² to 27,281 km². NWRC defined Major Rivers in the Philippines as those having the drainage area of at least 1,400km² (Refer to “*Principal Rivers in the Philippines*” NWRC 1976). There are 18 major river basins in the Philippines.

This definition of Major River Basin is however not always clear in the following points.

- a) Criteria to designate Major River Basins other than the scale of those drainage areas
- b) Purpose of this designation in connection with river administration / responsible government agency
- c) Economic and social importance of major river basins in comparison with other river basins in national, regional, and local levels
- d) Relation between administrative boundary and river basin boundary
- e) Relationship between the Water Code and the Local Government Code in view of river administration

It is recommended that these aspects be studied separately from this JICA Study since it is out of scope of this JICA Study. However, this JICA Study will be conducted taking into account such aspects as much as possible with regard to the formulation of the Master Plan.

Although the definition is not always clear, the Study Team assumes that the Major River Basins should be managed directly by the National Government in view of the importance of national economic and social impact thereof.

The Cagayan River Basin having basin area of 27,281 km² is the largest river basin in the Philippines. Accordingly, the Cagayan River is one of the Major River Basins in the Philippines and thus should be managed by the National Government.

(2) River Administration

1) Provisions of Water Code regarding river administration

Water Code, Art. 3 states that;

“The utilization, exploitation, development, conservation and protection of water resources shall be subject to the control and regulation of the government through the National Water Resources Council” and

Water Code, Art. 79 states further that;

“The Administration and enforcement of the provisions of this Code, including the granting of permits and the imposition of penalties for administrative violations hereof, are hereby vested in the Council, and except in regard to those functions which under this Code are specifically conferred upon other agencies of the government, the Council is hereby empowered to make all decisions and determinations provided in this Code

2) These statements may be interpreted that NWRC (now NWRB) is fully responsible in all matters related to water management except the functions conferred upon other agencies. However, there are many cases of violation to this Code, such as illegal settlers in river areas, illegal cultivation in river area, illegal water diversion / illegal ground water extraction, etc. It seems that present water / river management would be insufficient probably owing to some unavoidable reasons such as poverty of farmers, insufficient financial capacity, insufficient knowledge on water and river, etc. In this regard, responsibility of NWRB should be clarified as a regulatory board.

3) According to NEDA based on the Local Government Code, Local Government Units (LGUs) should undertake infrastructure projects

including flood control works as much as possible. However, the Local Governments in reality have probably little capability to undertake river / flood control and river maintenance works. Therefore, the National Government is obliged to support / assist the local government. The sharing of flood control works by National Government and Local Government should be clarified.

(3) Ownership of Water

1) Provisions in the Water Code

The Water Code, Art. 5 states that

“The following belong to the State: a. Rivers and their natural beds, and b.....”

2) This provision implies that the rivers are owned by the state and accordingly shall be controlled by the National Government.

3) It should be clarified if river administration on all the rivers in the Philippines is in a responsibility of the National Government or partly by Local Government

(4) River area

1) Provisions in the Water Code

The Water Code, Art. 51 states that;

“The banks of rivers and streams and the shores of the seas and lakes throughout their entire length and within a zone of three (3) meters in urban areas, twenty (20) meters in agricultural areas and forty (40) meters in forest areas, along their margins, are subject to the easement to public use in the interest of recreation, navigation, floatage, fishing and salvage. No person shall be allowed to stay in this zone than what is necessary for recreation, navigation, floatage, fishing or salvage or to build structures of any kind”

The Water Code of the Philippines, Implementing Rules and Regulations, Rule II Control, Conservation and Protection of Waters, Watershed and Related Resources, Section 28 states further that;

“All easements of public use prescribed for the banks of rivers and the shores of seas and lakes shall be reckoned from the line reached by the highest flood which does not cause inundation or the highest equinoctial tide whichever is higher. Any construction or structure that

encroaches into such easement shall be ordered removed by the Ministry of Public Works.”

- 2) These statements may be interpreted such that the river area is defined as the public land along the river which is measured from the riverbank toward the protected areas as 3 meters wide from the bank in urban area, 20 meters wide in agricultural area, and 40 meters in forest area. The Study team could not understand what is the purpose to define such easement especially in agricultural and forest areas. This designated area seems to be too wide for maintenance works, recreational purpose, etc. Practically, this provision has not been applied to the rivers in the Philippines. The purpose and its criteria should be clarified.

Furthermore, these statements imply that riverbanks are indefinite and accordingly the river area is indefinite since the flood water level is variable depending on its magnitude. Highest flood should be defined more clearly with its magnitude showing its recurrence probability and / or recorded maximum flood. Otherwise, the line reached by the highest flood may not be defined.

- (5) Flood plain lands and flood control areas

- 1) Provisions in the Water Code

The Water Code, Art. 53 states that;

“To promote the best interest and the coordinated protection of flood plain lands, the Secretary of Public Works, Transportation and Communication may declare flood control areas and promulgate guidelines for governing flood plain management plans in these areas”

The Water Code, Implementing Rules and Regulations, Sec. 35 states further that;

“Establishment of Flood Control Areas – Whenever the Minister deems it necessary to declare flood control areas for the protection of flood plain lands, he shall publish the same in three (3) newspapers of general circulation setting forth the purpose of the declaration, the geographic limits of the declared control area, and the regulations, necessary to achieve the objectives”

Water Code, Art. 55 states further that;

“The Government may construct necessary flood control structures in declared flood control areas, and for this purpose it shall have a legal

easement as wide as may be needed along the adjacent to the river bank and outside the bed or channel of the river”

2) These statements imply that the Secretary of DPWTC (now DPWH) may declare flood control areas as needed and may construct flood control structures in the flood control areas. The following should be clarified

- According to DPWH, there is no river having designation of river areas and flood control areas notwithstanding these provisions
- In this regard, the following should be clarified
 - Which rivers are officially declared with flood control areas at present?
 - What is the responsibility of NWRB in this regard as a regulatory board?
 - Does NWRB has a ledger / registration sheet with maps of the flood control areas declared?
 - Does community people residing along the river know the promulgation of the flood control area, if there is?

(6) Use of river area

1) Provisions in the Water Code

The Water Code, Art. 51 states that;

“No person shall be allowed to stay in this zone than what is necessary for recreation, navigation, fishing or salvage or to build structures of any kind ”

2) Although this statement is clear, there are many people residing along rivers with house buildings so called squatters / unlawful residence. This statement should be publicly announced so as to be known well by all the people.

3) The Government also should take necessary actions to relocate people residing river areas with due consideration of provisions of appropriate livelihood for them to be relocated.

(7) Cultivation in the River Areas

1) Provision in the Water Code

The Water Code, Art. 56 states that;

“River beds, sand bars and tidal flats may not be cultivated except upon prior permission from the Secretary of DPWTC and such permission shall not be granted where such cultivation obstructs the

flow of water or increase flood levels so as to cause damage to other areas”

- 2) The meaning of “Cultivation” should be clearly defined whether it means agricultural cultivation, sand / gravel mining, fish farming and / or others inclusive. According to this provision, DPWTC (now DPWH) is responsible for giving permission of cultivation. The responsibility of NWRB should be clarified in this regard as a regulatory board?
- 3) The JICA Study Team assumed that DPWH is responsible for establishing of flood control areas and suggests DPWH to take necessary actions as soon as possible.

(8) Water permit / authority

According to NWRB, water permit may be given on the request of water users by the amount of 90% of available water at the designated point. This implies that the river maintenance flow is assumed at 10% of stream flow.

However, it should be estimated more precisely if 10% flow is sufficient for maintenance flow.

(9) Minimum stream flow and minimum water level

- 1) Provisions in the Water Code

The Water Code, Art. 66 states that;

“After due notice and hearing when warranted by circumstances, minimum stream flows for rivers and streams and minimum water levels for lakes may be established by the Council under such conditions as may be necessary for the protection of the environment, control of pollution, navigation, prevention of salt drainage, and general public use”

The Water Code, Implementing Rules and regulations, Sec. 33 provides further details on this Art.66. that;

“In the conduct of the hearing, the following shall be considered:

- a) ***Adverse effect on legal appropriators***
- b) ***Priorities that may be altered on the basis of greater beneficial use and / or multi-purpose use***
- c) ***Protection of the environment, control of pollution, navigation, prevention of salt water damage and general public use***
- d) ***Other factors relevant to the situation.....”***

- 2) The minimum stream flow for rivers may be recognized as “river maintenance flow”, which should be decided in due consideration of the following in addition to the above provision of Water Code, Art.66
- Recorded minimum drought runoff or natural drought runoff at any points at least should be released to the downstream to maintain natural environment.
 - Minimum flow required for domestic use i.e. washing in rivers, drinking water extracted from river, etc. should be maintained
 - Minimum flow to maintain minimum water depth required for navigation
 - River scenery / landscape should also be considered. It is said that one third of river width at least be covered by water in view of scenery and recreation purpose. This should be confirmed in public consultation.
 - According to NWRB, 10% of available water shall be maintained and 90% may be appropriated to water permit. However, more precise estimation should be conducted on required maintenance flow and available water.
 - This available water is to be recognized as natural original runoff before extraction for any purposes. This may be presented by an equation given below
Available water = Natural flow – Maintenance flow
– Already allocated flow
 - The above maintenance flow should be taken into account for allocation of river water when water permit is to be issued.

(10) Observations and problems on Water Code

The most important aspect in the Water Code is that there are many cases in violation of the law. It may be recommendable that a special task force to solve this problem be established with members from all the Government Agencies concerned.

The following are the summary of main issues discussed above.

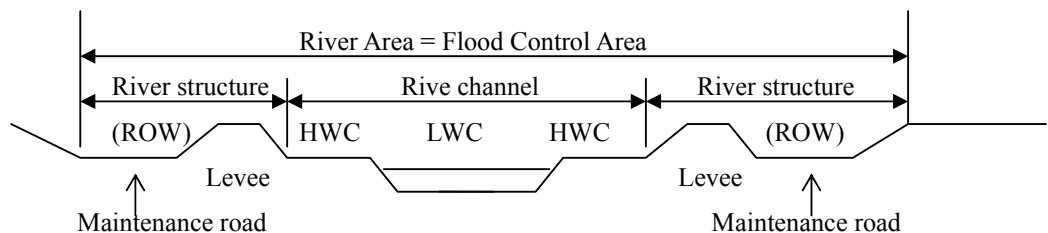
- a) Major rivers
- Major rivers should be defined more clearly in connection with river administration
 - Rivers to be managed by the National Government and Local Government should be defined

b) River administration

- It should be confirmed among the related agencies that NWRB is fully responsible for water and river administration
- In this connection, it also should be clarified what is the responsibility of NWRB in such case that some functions are conferred upon other agencies of the Government. The Study Team has an opinion that, even in such case, NWRB is still responsible to monitor real situation of water / river management and to give directions to relevant agencies to follow exactly to this Code.

c) River area and flood control area

River area should be clearly designated on each river by the Government through NWRB as illustrated below



In conjunction with the Water Code, Art.3, Art.5, Art.51, Art.53 and Art.55, it may be said that the Government shall undertake the following

- The Government shall define river bank. It is suggested to define river bank considering the following
 - In case of natural river without any artificial structures, river area should be defined as the areas covered by flood inundation. 10-100 years probable flood may be applied depending on river condition and its socio-economic conditions
 - In case of artificial rivers with levees, river areas may be defined as illustrated above. In this case, the river area is the same as flood control area
 - It is suggested that sufficient river width be retained in case of natural rivers so that future river improvement with dikes may not involve land acquisition problems. In this Study, river width is designed to be about $B=10\sqrt{A}$, where S is river width in m and A is drainage area in km^2 .

- The Government shall acquire land of all the river areas including not only structure area (ROW) but also river channel areas.
- The River areas declared by the government should be clearly announced to the public.
- The declaration of flood control areas shall be promulgated officially.
- NWRB shall monitor and oversee all declarations and prepare its ledger / registration
- All the ledger sheets listing river areas and flood control areas designated should be submitted to related Local Government.

d) Land use regulation

Water Code, Art.51, Art.56, and those Implementing Rules and Regulations are insufficient to manage river area, since the land along the river is only way for inhabitants to maintain their life. In view of this, the Government should take the following actions.

- To acquire the land in the river areas and flood control areas designated totally
- To resettle the people residing in river areas / flood control areas to other areas to be provided by the Government and / or
- To allow the people to use the river area and / or flood control area land for agricultural cultivation as far as it may not obstruct flood flowing in river channel, not causing water quality degradation, and fulfilling other conditions required.

e) Other clarification required

- What is a real situation of river management to collate with provisions on this Code?
- What are the reasons why there are many illegal activities with regard to water and river?
- Which agency is responsible for supervising such illegal activities?
- What are required for the government to eliminate such illegal activities?

The conceivable reasons for the people to do these illegal activities would be that;

- Lack of people's awareness: The people do not know the existence of such rules and regulation.
- Lack of people's capability: The people have insufficient capability and / or do not aware meaning of these rules and regulations in terms

engineering, costing / financing and management even though they know the existence thereof.

- Separate / independent responsibility of the water related institutions in reality and no unified responsible institution covering all the aspects on water / river: Delegation of power on water / river use management leaves the related agencies to implement their respective fields only having no concern in other fields.

2.1.2 Local Government Code

(1) Basic Policy of the Government

The Local Government Code was promulgated by the Republic Act No 7160 (RA 7160) on 10 October 1991. The RA 7160 aims at enhancing the capacity of local government in sustaining decentralization, local autonomy and better local governance.

Following to the Local Government Code, NEDA is making effort to promote Local Government Units (LGUs) to implement infrastructure projects including flood control and / or river improvement projects as much as possible.

1) Undertakings by the Local Government

Notwithstanding the government policies, almost all the major river improvement projects have been undertaken by the National Government (NG) since LGUs have insufficient technical and financial capability to undertake large-scale flood control projects. There are neither rules & regulations nor criteria to decide which river basins are to be undertaken and / or managed by NG or LGUs concerned. The Cagayan River is the largest river in the Philippines encompassing four provinces substantially. Therefore, in view of its economic and social impacts, and elimination of water struggle among the Provincial Governments, the flood control project of the Cagayan is to be undertaken by NG. On the other hand, to enhance the capability of local governments is one of the government thrust. Therefore, joint operation with NG and LGUs be considered for the project implementation for the Cagayan River Basin Water Resources Development Project.

LGUs have little implemented flood control works in the objective area of the Cagayan. Almost all the LGUs have regarded that major flood control projects implementation is the mandate of the National Government according to the practices so far conducted. It should be clarified that LGUs should share a part of the project construction works with cost sharing.

According to the practice in the implementation of big-scale flood control projects in this country, which are completed or on-going, LGU shares the cost for land acquisition and resettlement in several cases. This practice may be applied similarly in the Lower Cagayan Flood Control Project.

Some LGUs are intending to implement flood control projects / reforestation projects in their administrative areas with its own finance supported by the NG's financial assistance. This is one of the new movements of the active participation of the LGUs for flood control sector.

Tuguegarao City, as one of the cases, is intending to implement, not finally decided yet, flood control project by applying loan from the NG so called LOGOFIND (Local Government Finance and Development Project). LOGOFIND will provide LGUs with financial assistance with conditions of financial composition: Loan 35%, Grant 50%, Equity 15%, and repayment conditions: Interest rate 14%, 15 years repayment period with grace period 3 years.

Nueva Viscaya Provincial Government has implemented reforestation project in its administrative areas. This is also one of the cases of Local Government involvement for watershed management.

The Local Government involvement above mentioned is however limited to specific areas and small-scale projects.

There is no specific provisions concerning flood control / infrastructures in the Local Government Code. As explained previously in the Water Code, classification of rivers is pre-requisite in which the rivers to be managed by the Local Government should be clearly defined. Otherwise, almost all the local governments may no change their understanding that flood control works shall be undertaken by National Government.

2) Cost sharing by the Local Government

In relation with the Local Government Code, some local governments are going to implement small-scale rural area development projects with financial support by lending institutions. Furthermore, DOF is promoting local government finance for development project and environmental project including river protection with the cost sharing by local governments. Tuguegarao City is the 2nd Class City, which should share at least 15% according to LOGOFIND PROJECT which is initiated by DOF asking LGUs to conceive a loan from the NG and / or foreign lending institutions. However,

it would be impossible for even Tuguegarao City, the only city in the Cagayan Province, to share such amount for a big project as the Lower Cagayan Flood Control Project.

2.1.3 NIPAS ACT

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

1) Basic Policy

NIPAS Implementing Rules and Regulations states that the management, protection, sustainable development and rehabilitation of protected areas shall be undertaken primarily to ensure the conservation of biological diversity and that the use and enjoyment of protected areas must be consistent with that principle.

2) Categories of protected areas

NIPAS ACT defines the categories of protected areas as follows.

- a) Strict nature reserve
- b) Natural park
- c) Natural monument
- d) Wildlife sanctuary
- e) Protected landscapes and seascapes
- f) Resources reserve
- g) Natural biotic areas
- h) Other categories established by law, conventions or international agreement which the Philippine Government as a signatory
- i) In the Cagayan River Basin, wildlife sanctuary especially a special species of fish “Ludung” is to be protected. According to the local people, there has been illegal catching of “Ludong” and therefore fish resources are going to reduce year by year. Furthermore, local people said that “Ludong” was available in the Upper Cagayan in 1980’s, however, it is now no more available in the upstream areas. The reviewed Master Plan include this matter in the environmental study which is discussed in Supporting Report Annex V Environmental Study.

3) Prohibition of cutting trees

In line with NIPAS Act, the Government promulgated the presidential decree that states the prohibition of tree cutting in the designated primeval forest area and specifically in the mountainous areas above 1,000 m in elevation. This issue is also incorporated in the reviewed Master Plan.

4) Prohibition of slash-and-burn agriculture

The government already promulgated the prohibition of slash-and-burn agriculture. However, its enforcement seems to be very weak since it can be seen everywhere in the basin. This is one of the important issues to be considered in the land use planning.

5) Network of Protected Areas of Agricultural Development (NPAAD)

The Philippines is still insufficient in food supply, relying largely on importation of rice. In principle, the agricultural land may not be converted into other uses and such conversion is subject to the approval of DENR. These conditions are taken into account in the Master Plan Formulation.

6) Disaster Management System

The Government established already nationwide Disaster Coordinating Council System (DCC) constituting those of National, Regional, City, Municipality and Barangay levels (NDCC, RDCC, C/M/BDCC). The chairman of NDCC is the President of the Philippines. The DCC System is considered well functioning. This will be discussed in the non-structural measures of the Flood Control Project in ANNEX VI.

2.2 Organization

2.2.1 Overall Organization of the Philippine Government

Overall organization of the Philippine Government is shown in Figure 2.2.1 for reference. Among various line-agencies, following are the agencies primarily concerned to the Water Resources Development:

- a) Department of Public Works and Highways (DPWH):
 - Flood control by DPWH proper
 - Water resources management by National Water Resources Board (NWRB), an attached agency of DPWH
 - Water supply by MWSS / RWS, attached agencies

- b) Department of Agriculture (DA):
 - Agricultural development
 - Irrigation project by National Irrigation Administration (NIA), an attached agency
- c) Department of Environment and Natural Resources (DENR):
 - Watershed management by DENR proper
 - Water quality management by DENR proper
 - River environment management by DENR proper
- d) Department of Science and Technology (DOST)
 - Flood forecasting and warning system by PAGASA, an attached agency
- e) Department of National Defense (DND)
 - Disaster prevention by Office of Civil Defense (OCD), an attached agency
 - Disaster Coordinating Council led by OCD cooperated by other agencies concerned such as PAGASA, DEC, DPWH, NIA, NPC, NP, LGUs, etc.
- f) Department of Agrarian Reform (DAR)
 - Land acquisition and distribution by DAR proper
- g) Department of Interior and Local Government (DILG)
 - Coordination with Local Government
 - Supporting services to LGUs
- h) Corporations, NGOs, etc. other than Governmental Institutions
 - Hydropower by National Power Corporation (NPC)
 - Emergency services by Red Cross and other NGOs and private enterprises

2.2.2 Organization of Water-Related Institutions

NWRB provides organizational charts for water related works as shown in Figure 2.2.2 and 2.2.3 classifying into two categories; one is for functional relationship and the other is for organizational relationship. It is not so clear what are the differences between two categories and why they are needed. These charts imply that no-unified government institution to manage water and river and there are some confusions. NWRB is now studying set-up of new organization of water resources management / river management and re-organization of NWRB itself,

It is suggested that following would be integrated in the new organizational set-up.

(1) Functions required for river basin management

River management should cover the following tasks to ensure sustainable river functions

- 1) River basin conservation management (Watershed management)
- 2) Flood control management
- 3) Water resources management including water resources development and water allocation and water supply
- 4) River water quality management
- 5) River environment management

(2) Task and duties of water related agencies

There are many agencies concerned in rivers. The major government department and agencies related to water are as follows.

River basin conservation management (Watershed management)

DENR, NIA, BSWM, NPC, MWSS, LWUA, DPWH, DILG, DA, WD, and LGUs

Water resources management: (including water resources development and water supply / allocation)

NEDA, NWRB, LLDA, MWSS, LWUA, DPWH, BIA, DILG, DA, OCD, DOST (PAGASA), and LGUs

Flood control management

DPWH, OCD, DOST (PAGASA), DECS, NIA, NPC and LGUs

Water quality management

DOH, DENR (EMB), EHS, MWSS, LWUA, and LGUs

River environment management

DENR, NWRB, DOH, NHA, EMB, MWSS, LWUA and LGUs

The functions of the above are closely related each other.

As for watershed management, DENR seems to be leading agency and other agencies listed above are conducting reforestation, forest management, etc. in connection with projects they are undertaking.

As for water resources management, NEDA is a coordinating agency for project evaluation, NWRB is responsible for overall legislative matters specifically water allocation and permission. Other agencies are undertaking non-structural measures such as flood disaster management and flood forecasting and warning system in cooperation with other agencies.

As for river environment management, DENR seems to be a leading agency.

(3) Flood control institution

Among the agencies concerned, NWRB, DPWH, PAGASA, and OCD are the key institutions for flood control as discussed below.

1) NWRB

NWRB is responsible for the following (only major functions)

- a) To provide regulation relating to water and river including designation of river areas
- b) To give water permission / right to water users
- c) To give approval on the construction and rehabilitation of water-related works including flood control

2) DPWH

DPWH is mandated for the following (only major functions)

- a) To conduct planning, design, and construction of water / river related works
- b) To define flood control areas
- c) To give approval for river cultivation

3) PAGASA

PAGASA is mandated to undertake establishment, operation, and maintenance of Flood Forecasting and Warning System in cooperation with DPWH, NIA, NPC, etc. The main tasks mandated to PAGASA are enumerated below.

- a) Observation of rainfall and flood runoff
- b) Forecasting flood occurrence
- c) Dissemination of flood warning to related agencies and local people

4) OCD

OCD is functioning as a representative agency of the National Disaster Coordinating Council (NDCC) including flood disaster. Its principal mandates are;

- a) To establish disaster preparedness plan in national level
- b) To transmit flood warning message to related agencies, warning message of which is disseminated by PAGASA
- c) To establish disaster mitigation measures at emergency case in cooperation with other agencies, such as DPWH, NIA, NPC, DH, DECS, etc.
- d) To report to the President on disaster including the following
 - Disaster report including flood phenomenon, damages in nature and amount, etc.
 - Need of calamity fund release, if necessary
 - Proposed counter measures to coop with disaster
 - Record of calamity fund release
 - Proposed rehabilitation program, etc.

2.2.3 Organization of DPWH

This sub-chapter presents the organization of DPWH Central Office, DPWH Regional Office R-2 and LGUs concerned as key institutions of the flood-related Government agencies. Organization of other agencies such as irrigation, watershed management, etc. are discussed in the respective Chapters

(1) DPWH Central Office

1) Mandates of DPWH

DPWH is mandated under Executive Order No.124 issued by then President Corazon Aquino on 30 June 1987 to continue to develop its technology for the purpose of ensuring the safety of all infrastructure facilities and securing for all public works and highways the highest efficiency and the most appropriate quality in construction.

As such, the DPWH is designated as “the State’s Engineering and Construction Arm” responsible for planning, design, construction and maintenance of infrastructure facilities particularly highways, flood control and water resources development system and other public works in accordance with national development objectives.

2) Overall organization of DPWH

Current organization of DPWH is shown in the attached Figure 2.2.4 DPWH constitutes the Department Proper, 6 services, 5 staff Bureaus, 16 Regional Offices and 26 Project Management Offices.

Planning Services under the Department Proper is undertaking the project planning in the master plan and feasibility study. Accordingly, the Feasibility Study on the Lower Cagayan Flood Control is undertaken by the Planning Services.

Project Management Office (PMO) is tasked to undertake project implementation. Recently PMO-MFCDP was restructured with two clusters, i.e. cluster I and II. Cagayan PMO was newly created under the Cluster II. Organization chart of PMO-MFCDP Cluster II is shown in the attached Figure 2.2.5.

3) Man-power of DPWH

According to DPWH, total number of DPWH staff is counted for about 34,800 persons, of which the regular staff is about 19,200 persons (about 55% of the total) and others are the contractual and daily casuals. Number of engineers is not known yet since the engineers are classified by their grade but not by specialty.

4) Manpower of PMO-MFCDP

Total number of PMO staff in PMOs is counted for about 1,700 persons inclusive all the PMOs, PMO Clusters and Field PMOs in each project site. One Field PMO has around 40-45 staffs. Regular staff of Field PMOs are very minimal (exact figures are not known yet, but it is said only 1-3 persons of regular staff for one project)

5) Annual Budget

According to 2001-2004 Medium-Term Public Investment Program (MTPIP), annual investment program of DPWH for the whole country is as shown below.

Unit: Billion Pesos

Year/ Project	Highways	Flood Control	Others	Total	Annual Increase
2001	21,878	5,347	7,751	34,976	
2002	27,228	7,079	8,311	42,618	21.8%
2003	37,352	7,849	11,282	56,483	32.5%
2004	43,464	8,546	11,330	63,240	12.1%
Total	129,922	28,821	38,674	197,417	
Share	65.8%	14.6%	19.6%	100%	

Source: MTPIP by DPWH. See attached Table 2.2.1

The above budget allocation shows the investment amount for three sectors, i.e. highways, flood control, and others, shares of which are about 66%, 15% and 20% respectively.

Flood control sector is so limited as less than 15% of the total investment. The above fund allocation is decided on the criteria on the regional socio-economic balance. It is suggested that more detailed study be conducted based on the sector-wise actual requirement.

Among this budget allocation, total investment of about 197.4 billion Pesos equivalent, foreign assisted project shares 59.4 % and locally funded shares 40.6% respectively.

(2) DPWH Regional Office

1) Overall organization

Overall organization of the Regional Office (R-2) is shown in the attached Figure 2.2.6.

DPWH R-2 office located in Tuguegarao City is headed by the Regional Director. The Regional Office has 6 divisions as follows.

- a) Planning and Design Division
- b) Construction Division
- c) Material and Quality Control and Hydrology Division
- d) Maintenance Division
- e) Comptrollership & Financial Management Division
- f) Administrative Division

Under the management of the Regional Director, there are 10 Engineering District Offices (ED) and Regional Equipment Services (RES)

Almost all the construction works have been implemented by ED Offices under the supervision of the Regional Office.

The RES has undertaken supply of the construction equipment for the construction works for the Regional Office proper and its DEs. When the equipment are available, RES may lease them to private sectors as demanded.

2) Authorization of Project Implementation

According to DO 60 in 1998, Regional Office R-2 was authorized to conduct planning and design of project with cost less than 50 million Pesos and to implement projects with cost less than 30 million Pesos.

Further, DO 61 in 1998 authorized the DE to implement project with project cost less than 15 million Pesos. This delegated authority might be far less than the required power to implement the Lower Cagayan Flood Control Project, if Regional Office should implement it.

3) Mandates of each division and section in R-2 Office

- Planning and Design Division:
Within the above authorization, planning and design of all the infrastructure projects are to be conducted by this division under R-2.
- Construction Division:
Also within the given authorization, the construction supervision is to be conducted by this division.
- Material & Quality Control and Hydrology Division:
Materials and quality control is to be undertaken by this division. Also hydrological measurement is to be conducted by hydrology section under this division. This section has conducted regular water level and runoff observations in existing 20 gauging stations in Region 2. These data observed have been sent to the Central Office BRS. However, annual reports on hydrological observation were not always published for use for planning and design although the annual reports were issued before 1980's by the then NWRC. In 1986 and thereafter when NWRC was restructured and renamed as NWRB, this function was transferred to DPWH, BRS and annual report issuance were discontinued.
- Maintenance Division:
This division is responsible to undertake maintenance of existing

roads, bridges, and buildings. For the maintenance works, District Engineer's Office prepares and submits annual program for maintenance work. The maintenance division monitors and evaluates the said annual program, then submits it to the Central Office, BOM for approval.

The Lower Cagayan Flood Control Project, main subject of this Study, would be considerably large-scale project. Accordingly, the maintenance work thereof after completion would also be of large-scale. Re-organization of the maintenance division would be essential when the Lower Cagayan Flood Control Project is implemented.

4) District Engineer's Office (DE)

There are 10 DE Offices under R-2. Those DEs undertake project implementation and maintenance work of the existing infrastructure especially national highways and bridges in administrative area of respective districts.

5) Regional Equipment Service

Regional Office R-2 has number of equipment counted for 261 units such heavy construction equipment as dump trucks, bulldozers, power shovels / backhoes, road-rollers, graders as well as ordinary equipment as cranes, compressors, ordinary trucks, vehicles, boring machine, etc.

Regional Office has 1-Regional Equipment Service and 4-Area Services / Sub-area Service. The organizational chart of Regional Equipment Service is shown in Figure 2.2.7.

RES manages all the equipment, which belong to R-2 and conducts rehabilitation of these equipment. The Area Service conducts regular maintenance and repair works of the equipment in principle.

Present operation condition of RES may be summarized as follows.

- a) Existing construction equipment are almost all old aged ones which majority were procured in the latter 1960's - early 1980's. This implies that maintenance and repair might be very costly.
- b) According to the data provided by RES, working efficiency of these equipment (actual working hours divided by total workable hours: 8 hours per day) is so low as 30% on annual average, consuming much time for waiting for repair and waiting for job. It is needed to

consider renewal of that equipment if it is necessary to utilize such equipment for operation and maintenance of the completed projects.

- c) Furthermore, RES informed that road maintenance work (major work of RES equipment to be assigned) has been implemented at present by contract system by 70% and by administration by 30%.

The above situation implies that it is a sheer waste to use such old equipment with low working efficiency.

This is one of the factors to be considered in the organization of project implementation by force account system, so called by administration. The Study Team requested RES to work out precise Operation Plan of RES for 2000/2001 taking into account the following.

- a) Work volume by work item,
- b) Required number of equipment by these types,
- c) Procurement of required equipment by RES, DO, and / or private sectors (contractor / leasing company, etc.),
- d) Annual operation and maintenance cost including RES operation cost including all expenses of wedges, materials, etc.

However, at this moment, a complete set of the program will be provided yet.

This is very important to strengthen project implementation capability of DPWH R-2, and it is recommended to study whether RES continue present operation, reduce its capacity, or abolish / restructure.

According to the R-2, most projects are the construction of highways, i.e. roads and bridges. Flood control project is limited to piecemeal projects such as small-scale bank protection and spar dikes. The Regional Office R-2 has little experiences of large and / or schematic flood control works.

6) Staffing

Number of staff in Regional Office R-2 is summarized in the table below.

Office	Management Staff	Engineers	Administrative / Supporting Staff	Total	% Share
R-2 Office	3	80	120	203	18.6
District Eng. Office					
Batanes	2	13	46	61	5.6
Cagayan 1 st	2	21	63	86	7.9
Cagayan 2 nd	2	10	21	33	3.0
Cagayan 3 rd	2	15	56	73	6.7
Isabela 1 st	2	14	53	69	6.3
Isabela 2 nd	2	7	22	31	2.8
Isabela 3 rd	2	16	57	75	6.9
Isabela 4 th	2	11	28	41	3.8
Nueva Viscaya	2	22	66	90	8.3
Quirino	2	20	66	88	8.1
RES	4	17	218	239	21.9
Total	27	246	816	1,089	100.0
% share	2.5%	22.6%	74.9%	100%	

Source: DPWH, Regional Office R-2

Total number of staff are counted for 1,089 persons, of which RES shares 21.9%, Regional Office 18.6%, and District Engineer's Office 59.5% (5.9% each DE on average). Wondering is the number of RES staff. This implies that DPWH recognizes importance of maintenance work by proper equipment arrangement.

7) Annual Budget

Annual budget of Regional office, R-2 (Release in CY 1999) is tabulated below.

Unit: Million Pesos

Office	Regular Appropriation	Personnel Cost	Maint. & Other Operating Expenses	Capital Outlay	Special Release	Total
R-2 Office	327.4	40.4	5.7	281.3	113.2	440.6
District Eng. Office						
Batanes	65.1	9.8	9.8	45.4	44.1	109.2
Cagayan 1 st	72.3	16.6	40.6	15.0	63.1	135.4
Cagayan 2 nd	44.8	7.1	28.5	9.2	69.9	114.7
Cagayan 3 rd	42.3	14.8	15.6	11.9	58.0	100.3
Isabela 1 st	44.6	15.3	15.0	14.3	72.6	117.2
Isabela 2 nd	54.0	7.2	21.0	25.7	54.3	108.3
Isabela 3 rd	29.0	12.6	6.0	10.5	122.7	151.7
Isabela 4 th	35.3	6.7	16.5	12.1	45.7	81.0
Nueva Viscaya	87.3	15.2	52.8	19.3	83.6	170.9
Quirino	56.1	16.0	27.6	12.6	160.0	216.1
RES	41.2	36.7	4.0	0.6	0	41.2
Total	899.4	198.3	243.2	457.9	887.2	1,786.6
% share	50.3%	11.1%	13.6%	25.6%	49.7%	100%

Source: DPWH Regional Office R-2

Total release in CY1999 was counted for 1,786.6million Pesos including all the offices under R-2.

Annual release consists of Regular Appropriation and Special Release. According to DPWH, R-2, the former “Regular Appropriation” only is counted in the original budget schedule. The latter “Special Release”, of which financial source is outside of DPWH, i.e. project cost financed by other sources such as DECS, DA, LGU, Office of President, etc. is coming in during the annual operation period. This means that the amount of Special Release is not known at the beginning of the year, thus it might be hard for R-2 to prepare overall annual operation plan.

Regular Appropriation and Special Release share almost same amount by about 50% each as seen in the above table.

According to RES, annual budget for overhauling of equipment is limited to such amount being enough for only 10 units of equipment annually. It seems that equipment may not be used fully because of budget constraint.

2.2.4 Local Government

The Cagayan River Basin encompasses 9 Provinces, i.e. Cagayan, Isabela, Nueva Viscaya, Quirino, Ifugao, Kalinga, Apayao, Mt. Province, Aurora.

Among those provinces, Apayao and Aurora Provinces share minimal areas within the Cagayan River Basin. Furthermore, it may be said, mainly Cagayan, Isabela, Quirino and Nueva Viscaya Provinces all of which belong to Region 2 cover the objective areas of the flood control project.

The detailed observations were made on the Cagayan Provincial Office, Tuguegarao City and 10 Municipalities, which are subject to the Lower Cagayan Flood Control Project.

1) Annual Budget of LGUs

Annual budget of each municipality in FY 1999 are as shown in the table below.

Unit: Thousand Pesos

Province/ Municipality/ City		Revenue			Expenditure		
		IRA	Local	Total	General Exp.	Develop-ment Exp.	Total Exp.
Cagayan Province	Baggao M.	48,908	3,811	52,719	52,719	8,600	61,319
	Solana M.	31,554	6,219	37,773	34,952	6,972	41,924
	Piat M.	16,094	3,410	19,504	17,626	882	18,508
	Gattaran M.	38,000	14,600	52,600	39,045	10,054	49,099
	Iguig M.	14,714	1,069	15,783	12,988	2,816	15,805
	Amulung M.	23,458	1,194	24,651	21,162	4,692	25,853
	Sto.Nino M.	26,758	877	27,635	25,486	1,658	27,143
	Tuguegarao C.	44,886	57,120	102,006	81,614	24,709	106,323
	Cagayan P.	413,255	42,608	455,862	489,318	45,850	535,168
Isabela Province	Sta.Maria M.	15,834	862	16,686	16,390	550	16,940
	Cauayan M.	45,903	34,770	80,673	78,617	?	78,617
	Reina M.	13,012	1,035	14,050	10,675	3,238	13,914
Simple Average		61,031	13,964	74,996	73,383	9,168	82,551
% Share		81.3%	18.7%	100%	88.9%	11.1%	100%

Source: Respective LGUs

Majority of annual income comes from IRA counted for more than 80 % on average. Tuguegarao City is exceptional case that local revenue is higher than the IRA.

As for the annual expenditure, about 90% are allocated for general expenses consisting of personnel cost, office running cost and administrative cost, and about 10% are for development expenditures. Among the development expenses, biggest share is for road and bridge construction, followed by building construction. Flood control and drainage expense is minimal counting for only 6.1% of the total development expenditure on average.

The Local Governments have realized that flood control works are to be implemented by the National Government. Therefore, flood control program is little presented in the annual program of related LGUs even though they have appealed real necessity of the flood control works as topmost priority among others, which were identified by mutual consent in the workshop held in Tuguegarao, Isabela and Bayombong on September 5-7, 2000.

Tuguegarao City

Tuguegarao City is rather different from other LGUs in terms of flood control works. Hereunder presented is the brief of the development program by Tuguegarao City in CY 2000.

Tuguegarao City has a special attention on the flood control project implementation. The City issued its Annual Development Plan for CY 2000 on June 8, 2000. The budget program thereof is summarized below.

	Million Pesos
General Fund-Capital Outlay	74.4
20% Development Fund	32.16
Total	106.56

Among this budget, road improvement shares 18.8% (20 Million Pesos) and flood control including drainage shares 19.8 % (21.1 Million Pesos), and others such as buildings, irrigation, Barangay infrastructures, etc. Noticeable is the largest share in drainage and flood control project. According to the City, the flood control project is the top priority project in the City.

The City implemented infrastructures so far by administration, however, it turned to the contractor system for more extensive construction works to be implemented from now on.

2) Manpower of LGUs

Manpower of LGUs is summarily shown in the Table below.

Province/ Municipality/City	Category of Staff					
	Management staff	Eng. Staff	Non-Eng. Staff	Support. Staff	Total Number of staff	Regular Staff
Baggao M.	14	11	23	85	133	125
Solana M.						
Piat M.	3	4	27	65	99	90
Gattaran M.	2	3	0	99	104	62
Iguig M.	9	10	7	21	47	47
Amulung M.	13	1	16	48	78	60
Sto.Nino M.	5	2	24	57	88	88
Tuguegarao C.	3	4	4	109	120	120
Cagayan Prov. (PO)	93	?	?	611	704	621
Sta.Maria	4	2	0	41	47	16
Cauayan	7	4	2	252	265	265
Reina M.	36	1	6	23	66	33
Simple Average except PO	9.6	4.2	10.9	80	105	91

Source: Respective LGUs

Some Municipalities have engineering staff, but some have almost none. Numbers of engineers in LGUs are so limited to 1-11 persons by municipality.

Number of Engineers is different from each other. Some LGUs have Engineers and have been implementing infrastructure projects by force account system and / or contract system.

Among those LGUs, Provincial Office and Tuguegarao City have their own construction equipment.

In case of Tuguegarao City, it has City Engineer's Office. The City has initiated the implementation by contract system after it became a City in January 2000, although it implemented all infrastructure projects by force account system before. The City Engineer's office said that flood control project in the Lower Cagayan would be better to be implemented by contract system for the reason that contract system is more flexible to ensure schedule control by means of project packaging.

All the LGUs have implemented infrastructure projects, but almost all of which are of small scale ones such as farm to market road, school buildings, other public buildings, etc. They have little experience of flood control projects.

2.2.5 Preliminary Consideration and Recommendations

Based on the present situation of DPWH Regional Office and LGUs, following may be pointed out in summary.

- a) According to the current regulations in terms of regulation, budget / experience, and manpower (Engineers), it would be very hard for Regional Office to undertake the implementation of the Lower Cagayan Flood Control Project by its own.
- b) The Study Team attempted to study on construction method either contract system or force account system. Force account system can be applied for construction works with reinforcement and / or renewal of construction equipment. However, present condition of equipment operation could not accept force account system. Furthermore, 70% of maintenance work of highways has been implemented by contract system. Therefore, force account system is not recommended.
- c) In due consideration of the above, therefore, for the implementation of the flood control project, PMO in Manila or a new PMO, which will be newly established for the specific project, should undertake the project
- d) For the implementation of the Master Plan, a new institution would need to be established like a Development Authority.
- e) It would be suggested that more efficient operation system of R-2 be examined especially Regional Equipment Service (RES).
- f) LGU's participation and its cost sharing for implementation of the Lower Cagayan Flood Control Project should be examined in more detail.
- g) Some LGUs are willing to participate in the Lower Cagayan Flood Control Project.

CHAPTER 3 SUPPORTING MEASURES OF FLOOD CONTROL

3.1 Definition of Supporting measure

Flood damage or disaster may be conceptually given by the following equation.

$$\text{Flood damage} = \text{Hazard} \times \text{Vulnerability}$$

Hazard is a risk of natural disaster and may be reduced by structural measures of flood control. Vulnerability is a social weakness for coping with hazard.

If there is no people in the hazardous area and no property therein, no damage may occur. The vulnerability may be reduced by means of relocation / resettlement and / or evacuation of affected people at risk of emergency hazard. Resettlement and Evacuation are called here as non-structural measures.

Supporting measures are those required for fulfilling functions of structural and non-structural measures and sustain these functions.

3.2 Needs of Supporting Measures

Supporting Measures is an essential component for implementing effectively flood control direct measures consisting of structural measures and non-structural measures. The needs of supporting measures are for;

- a) Smooth implementation of the projects
- b) Effective operation of the facilities
- c) Sustainable maintenance of the facilities
- d) Emergency counter measures

3.3 Problems Encountered at Present

(1) Pre-construction and Construction stages of structural measures

For the structural measures, the Cagayan River is presently primeval river with few and piecemeal flood control structure such as bank protection and groins. Therefore, no distinct problems have been raised at this moment in the Cagayan. However, in other rivers, it was reported that the project implementation has encountered some problems. OECF (now JBIC) conducted SAPI Study in 1999 on Institutional Capability Building in River Sector in the Philippines. The Study revealed that a core problem is “Delay of the project implementation” in the

on-going and completed projects in the country. It was reported that the following caused the delay of the project implementation.

- a) Low capability / capacity of contractors
- b) Difficulty on land acquisition and compensation
- c) Time consuming procedure for approval, and
- d) Opposition by community

Among these factors, items b) and c) are most serious problems.

Furthermore, these problems are closely related with each other and also related with non-structural measures. Those problems are institutional matters which would be very hard to solve and take much time for improvement.

(2) Operation and maintenance stage of the structural measures

The people relocated came back to the original place in many cases in the country. It seems because the people relocated had no job for keeping their livelihood. Those people could be affected by possible disaster again.

(3) Construction Stage of Non-structural Measures

There would be no major problems in the construction stage except budgetary constraints.

(4) Operation and Maintenance Stage of Non-structural Measures

The Philippine Government has extended much effort to establish Disaster Coordinating Council System in order to prevent disaster by means of flood forecasting and warning system and evacuation system. This system is well functioning except some facilities damaged and shortage of food supply system, etc. Those problems may be solved by little effort together with improvement of the facilities.

3.4 Present Supporting Measures

Supporting measures are closely related to the institutional aspects, such as law and regulation, Government services, and cooperation by the communities concerned, etc. Discussed below are the supporting measures currently undertaken in terms of Government services, cooperation by NGO and private enterprises.

(1) Government Services

Supporting measures for flood control are undertaken principally by the National Government and LGUs. Current services are well functioning in general within

available resources, although some strengthening is required. Principal functions of the Governments are enumerated below.

1) National Government

Project management of flood control structures and its operation and maintenance (by DPWH)

Flood forecasting and warning information dissemination (by PAGASA and OCD) to LGUs and local communities.

Disaster preparedness at the emergency case, through Disaster management system so called as National Disaster Coordinating Council (NDCC) which is explained in the previous Chapter

Special arrangement of funding allotment in emergency case including arrangement of man-power, equipment, rescue services, food supply, etc. (by respective agencies such as DPWH, PAGASA, OCD, NIA, NPC, DECS, etc.)

Community awareness building through workshop, consultation meeting, public hearing, etc. (by respective agencies)

2) LGUs (Provincial Government, City / Municipality, Barangay levels)

LGUs are principal entities for supporting services for flood control activities in disaster management in their administrative areas.

LGUs have own calamity fund amounting to 5% of IRA which may be used for emergency cases.

LGUs arrange necessary equipment and materials for emergency activities within their capacities and capabilities together with National Government.

Cooperation / assistance to the National Government to conduct community awareness building.

(2) NGOs, Private enterprises and communities

There are many NGOs, which are operating nationwide and / or in local areas, that are actively participating in the disaster management, especially in emergency case. The National Red Cross is one of the representative organizations. Their activities are enumerated below.

- 1) Preparation of preparedness plan on disaster prevention activities showing their participation on disaster management
- 2) Funding support on emergency cases including food and drink supply, etc.
- 3) Demonstration on disaster prevention activities to the community
- 4) Preparedness by the communities in Barangay level for emergency

(3) Institutional Arrangement

The principal matters on the supporting measures on flood control are institutional arrangement including laws and regulations, organizational set-up, funding, etc. Those matters have been discussed in the previous Chapter 2.

3.5 Supporting Measures of Flood Control Long-term Plan and Master Plan

(1) Basic Approach to Supporting Measures

The supporting measures should cover very extensive services / activities to construct the facilities and to make use such facilities effectively after construction. Necessary functions of the supporting measures are mentioned in sub-chapter 3.2.

Present supporting measures and future requirement of supporting measures are summarily presented in the attached Table 3.5.1 including supporting measures for irrigation project. The explanation below is given dividing into Before Construction, During Construction, After Construction and Common to all the Stages of Construction Works.

(2) Before Construction

The NWRB is responsible for providing necessary rules and regulations on flood control. DPWH is responsible for planning, design and construction of non-structural measures. To eliminate the possible problems to be encountered in the project implementation through out pre-construction, during construction and after construction of the facilities, the following are suggested.

- 1) Review of Implementing Rules and Regulations (IRR) of the Water Code
 - a) Revision of the Water Code and its Implementing Rules and Regulations as explained in the previous chapter specifically the following.
 - Designation of river areas and flood control areas
 - Clarification of tasks and duties of all the agencies concerned specifically NWRB, DPWH and LGUs

In addition to the above, in the review of IRR, it is suggested that special provision on penal clause be included. Such penal clause should be practical one since there are many illegal activities at present.

b) Relocation / resettlement of people residing in the river areas

This is a pre-requisite for commencement of the construction work.

- Establishment of rules and regulation on resettlement by National Government
- Resettlement should be undertaken by LGUs concerned, since they know very well the local conditions. It should be supported by DPWH, NIA, DILG Regional Office R-2.

2) Land acquisition is a vital problem for the implementation of river projects as seen in the on-going flood control projects. The Municipality Mayors being subject to the Lower Cagayan Flood Control Project have agreed in the consultation meetings to implement the project. However, more attention should be paid carefully on the following.

- Sustaining and improving livelihood of the people to be relocated
- Inventory survey of land ownership
- Special arrangement of land use regulation would be inevitable as explained in the previous sub-chapter, such that the farmers to be relocated may use the land in the river area for agricultural cultivation as they are using now

3) Compensation

Compensation for resettlement including land acquisition should be conducted timely and reasonably. Since this flood control project will take long time for about 20 years up to the entire completion of the Lower Cagayan. There would be inflation during this period and land acquisition cost will increase. It is suggested that the Government prepare a formula to calculate land price with escalation rate in the future.

4) Implementation Organization

As explained in the next sub-chapter, implementing organization should be set-up well in advance of the construction works. It is suggested that the following be considered in setting up the organization.

- Cooperation with National Government and LGUs
- Involvement of DPWH R-2 office specifically for relocation, land acquisition and compensation, since it knows well the local conditions

5) Financial arrangement

The Lower Cagayan Flood Control Project is rather big-scale project needing considerable investment amount. It is suggested that the Philippine Government will look for foreign assistance for financing as well as local finance.

As mentioned in the previous sub-chapter, LGUs have insufficient capacity to finance even a part of the project. Their IRA would be limited to 40 million Pesos or less annually except Provincial Government and Tuguegarao City. Development fund is also limited to 20% of IRA which would be necessary to do other development. However, in view of the beneficiary-to-pay principle, LGUs should share a part of the cost. It is suggested that LGUs share at the amount of 20% of the above development fund. This should be decided through a dialogue with LGUs.

6) Decentralization program

Regarding FFWS, Tuguegarao sub-center has no power to decide and no allocated fund for daily operation. It is suggested to delegate power to the sub-center so that local FFWS can be operated by itself.

7) Supporting system for farmers

This is related to the proposed irrigation project of AAWPIP as well as the flood control for the farmers who are involved in the irrigation project and also affected farmers by the flood control project.. The conceivable ways of supporting system are improvement of trading system, establishment of farmers association / corporation, use of river areas as explained before.

(3) During construction

1) Selection of contractor

As pointed out by the SAPI Study by OECF (now JBIC), one of the causes of “Delay of the Construction Works” in insufficient ability of contractor. The highest qualified contractor should be selected for the implementation of the Lower Cagayan Flood Control Project. It is suggested that highest qualified, class AAA, Contractor be selected for the Lower Cagayan Flood Control Project.

2) Construction supervision

Since the staff of PMO-MFCDP is limited in its number and technical capability, and according to the basic policy of the Government, to minimize number of Government Officials, Consultant be employed for the supervision of the construction works.

3) Preparation for operation and maintenance

The Government should prepare operation and maintenance manual of the facilities to be constructed with assistance of the Consultant. The Consultant should prepare “Operation and Maintenance Manual” during the construction stage so that the facilities can be operated properly immediately after the completion of the facilities.

(4) After construction

1) Monitoring system of infrastructure

It may be said that maintenance works would be insufficient in general for infrastructures. After completion of the facilities construction, well maintenance is pre-requisite to keep sustainable functions of the facilities. Monitoring system should be established. Annual regular monitoring be conducted for overall inspection and data collection thereof. Regular inspection should be conducted and proper operation and maintenance be conducted by monitoring group to be established properly.

2) Rehabilitation Program

Annual operation and maintenance cost would be more or less 0.5% of the project cost. Rehabilitation program should be prepared well and appropriately conducted. Regrettably said, maintenance of construction equipment for maintenance work of highways is very bad conditions. Rehabilitation program for infrastructure should be prepared precisely in conformity with real needs.

3) Evacuation System

Evacuation system (evacuation center and its related facilities) should be maintained well for the future occurrence of disaster. However, the maintenance of evacuation system is insufficient at present.

Evacuation system includes administrative matters, such as flood disaster drill, food supply, drink supply, etc. The current disaster Coordinating

Council System is well provided functionally. It should be maintained for emergency. Some improvement should be done immediately as recommended in the non-structural measures of the Flood Control Project.

4) FFWS

Flood Forecasting and Warning System has been operated by PAGASA. National FFWS has many problems, such as radio wave interference, deterioration of equipment, robbery of equipment, etc. Sometimes, radio communication between PAGASA Central Office and Tuguegarao Sub-Center was interrupted. Therefore, local FFWS should be established. Thus, flood forecasting and warning operation can be conducted by local FFWS. For this purpose, some equipment should be replaced and / or rehabilitated. Most serious problem in the local FFWS operation would be the organizational matters, such that no power is given to the Tuguegarao Sub-Center, no regular fund for operation, insufficient staff, etc.

Operation manual should be prepared and training of the staff would be pre-requisite.

5) Resettlement

Resettlement should be conducted before and / or during construction of the facilities. However, re-settlers came back to the original places in many cases. It might be because of insufficient livelihood program. Monitoring system including such social aspect should be established.

(5) Common to all stages

1) Community awareness building

NWRB, PAGASA and almost all the agencies concerned are now conducting consultation meeting or public hearing with local people in order to acknowledge the present situation of communities understanding on flood and water allocation, etc. However, the fruits are not so attractive. More frequent and / or more reasonable actions are essential for promoting community awareness building. It is suggested that such consultation meeting be conducted getting all together the agencies concerned, but not independently by each agency.

2) Community participation

The community participation would be indispensable in the infrastructure development nowadays. The community should participate as much as possible in the planning, designing, construction, and in its operation. The people should know real situation of the infrastructure programs. This should be enforced by the Government.

3) Improvement of livelihood

The most serious problem in the implementation of the Lower Cagayan Flood Control project might be a resettlement of about 3,000 households. In this case, sustaining their livelihood and improvement thereof is topmost importance. LGUs concerned should pay a special attention on this matter. Conceivable solutions are a) agricultural farming in the original place in river areas, b) new business creation, c) reinforcement of agricultural production techniques, etc. LGUs concerned should examine those matters in the initial stages of project implementation until such time that all the people are settled safely keeping their livelihood.

The above mentioned should be kept in mind of the National Government and LGUs officials to eliminate further problems occurrence in the future.

CHAPTER 4 IMPLEMENTING STRUCTURE

4.1 Implementation of the Reviewed Master Plan

4.1.1 General

Implementing structures to be discussed herein include institutional arrangement and organization of the implementing structure specifically for implementation of the Reviewed Master Plan Projects and Programs.

4.1.2 Institutional Arrangement

Institutional arrangement herein describes necessary arrangement of law and regulation relating to an organization and funding for implementing Reviewed Master Plan Projects and Programs. Those arrangements should be conducted well in advance of the implementation of the Projects and Programs to eliminate unnecessary problems to be encountered in the implementation stage.

(1) Water Code and its Implementing Rules and Regulation

As presented in sub-chapter 2.1, there are some problems in the current law and regulations. NWRB is now reviewing the Implementing Rules and Regulations (IRR) of Water Code. The GOP should undertake the following measures to coop with the problems and in the revision of the IRR.

1) Major river basins

- a) GOP should promulgate officially the major river basins together with the name of a responsible governmental agency. It should be clarified which agency is responsible for river administration, National Government or LGUs concerned. It is recommended that the Cagayan River Basin should be officially announced as a major river basin, and the National Government is responsible for overall river administration.
- b) River administration should cover overall management of the river basin including a) watershed management, b) flood control, c) water resources management, d) water quality management and e) river environment management. Under current law and regulations, there are many agencies are involved for river management. There is no unified responsible agency for river administration in the Philippines It is recommended that GOP announce officially that DPWH is the responsible agency for river administration including

implementation of the Master Plan Projects and Programs of the Cagayan River Basin.

- c) The river management should be conducted in cooperation with other agencies concerned such as DENR, NWRB, PAGASA, DA/NIA, LGUs etc. Work demarcation of those agencies in relation to river administration should be reviewed and clarified with mutual consent of all the agencies concerned in writing, so called Memorandum of Agreement.
- 2) River areas and flood control areas
 - a) DPWH should designate the river area and flood control areas prior to the implementation of the Projects and Programs.
 - b) NWRB should announce such river area and flood control areas officially to public.
 - 3) Land use regulation
 - a) Water Code and its Rules and Regulation provides clearly the land use regulation. However, there are many illegal uses of river areas. Therefore, NWRB should announce officially to eliminate such illegal land use.
 - b) According to the Water Code, cultivation in the riverbed is prohibited. This cultivation may be understood as sand mining in riverbed. It should be clarified and should be included in the revised IRR.
 - c) NWRB should provide special provisions to allow farmers to use land in the river area for agricultural cultivation unless land use should obstruct flood flow. NWRB should draft such provisions and promulgate it officially. This is essential for the people residing river area subject to relocation to maintain their livelihood.
 - 4) Flood plain land and flood control areas
 - a) NWRB should designate flood plain land based on the hazard map presented in this Master Plan and officially announce it to public.
 - b) Flood control areas may be defined based on the basic design presented in this Study. For the river reaches of the Lower Cagayan, which is subject to the feasibility study under this JICA Study, flood control areas are the same as the river areas. NWRB should announce it officially to the public.

5) Water Permit / Authority

- a) There are 1,584 water right grantees in Region 2 and CAR as of 1999. NWRB gives such water right in consideration of the available water and maintenance flow.
- b) According to NWRB, water right is given as requested by water users within 90% of available water in quantity. However, NWRB should check the figure of 90% in view of that if remaining 10% is sufficient for river maintenance flow.
- c) Required river maintenance flow should be estimated precisely in due consideration of ecology, water quality, navigation, recreation, etc. It is recommended that drought runoff (350-day runoff) should at least be released to downstream as maintenance flow.

(2) Local Government Code

- 1) Local Government Code is aiming to promote localization and decentralization of the Government services. Local Government is operating its services within an available budget and its capability. Majority of annual budget comes from IRA (Internal Revenue Allotment), which is very limited and minimal in view of the cost sharing to the implementing Master Plan Projects and Programs.
- 2) National Government is intending to upgrade the capacity of LGUs so that LGUs can undertake flood control project. However, owing to the limited budget and insufficient technical knowledge, LGUs alone may not implement such big projects as the Cagayan Flood Control Project. It should be clarified what LGUs should share. The Study Team recommends that LGU should be involved in the project implementation with cost sharing in some part in views of beneficiary-to-pay principle and capability building of LGUs.
- 3) All these matters above mentioned should be settled prior to the project implementation on mutual agreement between National Government and LGUs by means of concluding Memorandum of Agreement.

(3) NIPAS Act

- 1) NIPAS Act is aimed to maintain natural environment to ensure the conservation of biological diversity.
- 2) There are so many illegal activities in the Cagayan River Basin in the light of the Code, slash and burn farming, farming in the river area, etc.

It is recommended that a special program may be formulated with a task force to cope with such problems together with the problems on Water Code.

(4) Relocation / Resettlement

- 1) Many people will be subject to relocation / resettlement by the project implementation. Number of household to be resettled is estimated at 2,433 for the Lower Cagayan Flood Control Project.
- 2) Relocation and resettlement should be handled by LGUs since they know well the local conditions. It should be implemented with assistance of the National Government.

4.1.3 Basic Concept of Establishing the Implementing Structure

The 1987 Master Plan had little studied on the organizational matters for implementing the Master Plan Projects and Programs, since peace and order situation at that time were very critical. According to the results of hearing to the local people, currently the social, economic and political situation has been remarkably improved. Therefore, the review of the Master Plan this time includes institutional study.

The basic concepts of establishing the implementing structures are given herein.

A proposed organization for implementing the Projects and Programs in the reviewed Master Plan of the Cagayan River Basin Water Resources Development in Figure 4.1.1. Basic considerations on this proposed organization are given hereunder.

(1) Cooperation among the National Government and LGUs concerned

As described previously, LGUs have little experiences for implementation of large-scale project and have few engineers, the National Government is obliged to undertake the implementation of the Master Plan Projects and Programs. However, LGUs, in line with Local Government Code, should be involved as much as possible for the implementation. It is recommended that scope of works by LGUs are as given below.

- 1) Resettlement area development and resettlement activities.
- 2) Plantation and maintenance of the tree zone.
- 3) Land acquisition of Right of Way (ROW: land areas to be occupied by the project structures) and land acquisition of other river areas for which the National Government should share the cost since the land ownership

belongs to the National Government. This should be confirmed among the related agencies and LGUs.

- 4) Assistance to the National Government and other minor works as required.

(2) Nature of the Projects

The Master Plan for the Cagayan River Basin Water Resources Development is a multi-sector project consisting of all components inclusive watershed management, water resources development and water supply, flood control, river water quality management, and river environment management.

Among those components, three major components as watershed management, flood control and water resources development for water supply are particularly reviewed in this JICA Study. The flood control project will be the first step to initiate basin-wide vigorous / strategic economic and social development.

(3) Special Institutions in the Philippines as practiced

There are some multi-sectors projects in the Philippines on-going and completed. In the multi-sectors projects, the three different institutional arrangements have been made as explained below.

1) Coordination Committee System

Coordination committee system has been widely applied in the Philippines. The projects, which are of multi-sectors but may be implemented independently in view of project area, funding sources, project implementation period and project functions without much connection among the involved agencies may be implemented by the coordination committee system.

Coordination committee may be established with mutual consent of all the agencies concerned.

2) Commission System

Commission system is adopted for Agno River Basin Development Project and Pasig-Mariquina Rehabilitation Project at present.

Commission system may be applied for such project as multi-sectors and long-term project needing close cooperation with each other in terms of cost sharing and schedule control for construction of multi-functional project with different technical and social natures like a river basin development.

The Commission may be established by the order of the President.

3) Authority System

The Authority system may be applied to complicated projects and / or programs, which need more comprehensive cooperation and coordination among the agencies concerned. Especially, in case that many sub-projects are simultaneously implemented as components of an overall development projects / programs, and such projects / programs taking long time for implementation and continuous activities for operation and maintenance like a basin-wide development project, Authority system will be more effective. Authority system has been widely applied in the world like a Tennessee Valley Authority. There is also example in the Philippines, like the Laguna Lake Development Authority, National Economic Development Authority, etc.

Authority shall be established upon a bill-passing parliament.

(4) Creation of Cagayan River Basin Development Authority

Taking into account the above mentioned factors, it is recommended that Cagayan River Basin Development Authority be established by such time that the Master Plan Projects and Programs will be implemented in full scale. In this case of the Authority, the following should be taken into account.

1) One river-one plan-one management

One river-one plan-one management strategy was firstly applied to the TVA in US as one of the success story for river basin development. In view of this, it is recommended to establish the Cagayan River Basin Development Authority as a body of one management,

2) Involvement of current line agencies

The current government line agencies will undertake as much as possible the projects within the task and duty as mandated in accordance with present regulations. In principle, DPWH will undertake the flood control projects and NIA / DA will undertake the irrigation projects

3) Coordination Committee

The coordination committee will be created under the Authority to coordinate all the works to be undertaken by respective agencies. Members of the coordination committee will consist of the representatives of related agencies

comprising DPWH, DENR, DA (NIA), PAGASA, LGUs and other related agencies as required.

4) PMO and sub-PMO

Project Management Offices (PMOs) will be organized by sector, i.e. watershed management, Land use specifically irrigation development, and flood control as a major components for river basin development.

5) Consultant

Consultants will be employed as advisors for Project Coordination Committee and for each sector project including PMOs.

Organizational set-up of implementing structure will be developed step-wise. The lower Cagayan flood control project and irrigation project will be implemented as 1st phase projects. In this case, Coordination Committee System will be adopted. Then this will be sifted to Commission System and further to Authority System step by step. This strategy was accepted by the Steering Committee of this JICA Study.

4.1.4 Duties and Tasks of Each Component of the Structures

The duties and functions of each component in case of Cagayan River Basin Development Authority are assumed as given below.

(1) Cagayan River Basin Development Authority

- 1) Full responsibility for implementation of all the projects which are included in the Reviewed Master Plan at this moment and will expand to include other water-related sectors in the future
- 2) Overall planning, budgeting, supervising for implementation of the Master Plan Projects and Program
- 3) Reporting to and getting approval of the higher authority, the Office of the President / NEDA and DBM

(2) Coordination Committee

- 1) Overall coordination of project implementation among all the member agencies
- 2) Advice and recommendation to the Authority for implementation of the projects especially inter-agency projects

(3) Project Management Offices (PMO)

- 1) PMO will be set-up for each project category for actual implementation of the projects by work field of respective agencies
- 2) PMO for watershed management to be led by DENR
- 3) PMO for flood control to be led by DPWH which will be further divided into PMO for resettlement & Livelihood Program by LGU, PMO for Lower Cagayan Flood Control Project by DPWH, PMO for Flood Forecasting and Warning System Project by PAGASA and DPWH, and PMO for Evacuation system by OCD, RDCC and C/M/BDCCs
- 4) PMO for land use, specifically irrigation project to be led by DA / NIA
- 5) PMO for Special Entities by the representatives of AFMA and CEZA

4.2 Implementation of 1st Phase of the Project

4.2.1 General

This chapter presents the implementation plan of the 1st phase of the projects covering Lower Cagayan Flood Control Project and Irrigation Project. The implementation plan herein includes implementing organization and implementing schedule of the preparatory works. The construction plan of the project is discussed in ANNEX IX.

4.2.2 Implementing Organization

(1) First Phase Projects (1st Phase Projects)

The 1st Phase projects recommended are;

- a) Flood control projects for the Lower Cagayan including structural and non-structural measures
- b) Alcala-Amulung West Pump Irrigation Project (AAWPIP) including irrigation system construction and supporting measures for improvement of farmer's livelihood

The Projects components are enumerated below concerning implementing agencies, which may be assumed under the current mandates given to them.

Project component	Implementing agencies Under current mandates
1) Flood Control Project	DPWH
a) Structural measures	
• Urgent bank protection works	DPWH
• Dike system work	DPWH
• Tree zone construction	LGUs assisted by DPWH
b) Non-structural measures	
• Evacuation system	
- FFWS	PAGASA and DPWH
- Evacuation center and other related facilities	LGUs, DPWH & DCCs
• Resettlement area development	
- Area development	DPWH, DA and LGUs
- Supporting measures for sustaining livelihood of resettles	LGUs, DPWH and NIA/DA
c) Supporting Measures	DPWH/DA with LGUs
2) Irrigation Project	
a) Irrigation system development	DA / NIA
b) Supporting measures	DA / NIA
- Livelihood improvement program	DPWH/DA and LGUs
- Other supporting measures to improve farmer's income	DPWH/DA and LGUs

(2) Organization

As explained in Sub-Chapter 4.1, the implementing organization for the projects and programs recommended in the Master Plan is rather comprehensive to implement inter-agency projects and programs.

The 1st phase construction works are limited to the Lowermost Cagayan Flood Control Project and AAWPIP. Therefore, the more simple system will be applied.

1) Basic Concept of the Organizational set-up

The basic considerations of the organizational set-up are as follows.

- a) Cooperation with National Government and LGUs is considered.

- b) Existing agencies will be involved as much as possible for the implementation of such works that may be executed within currently given mandates.
- c) For the 1st phase implementation, Coordination system will be applied.
- d) The organization for the 1st Phase implementation should be more flexible for future extension and / or transformation to the commission system in the next stage.

2) Organization

Proposed organization chart is shown in Figure 4.2.1.

- a) Superintendence by DPWH
DPWH will be a leading agency for the 1st Phase Project implementation. DPWH will be a superintendent for whole the projects getting all together the Flood Control Project and Irrigation Project.
- b) Coordination Committee
Coordination Committee will be created. The members of the Coordination Committee will consist of all the water-related agencies such as DENR, DA, NWRB, PAGASA and OCD from the National Government, and all members of Disaster Coordinating Council in Regional, Provincial, City/Municipality/ and Barangay levels and Regional and Provincial Development Councils. The consultant will be employed as advisers for the Coordination Committee as well as for the project supervision.
- c) Project Management Office (PMO)
Two PMOs will be established one each for Flood Control Component and Irrigation Component. The former will be led by DPWH and the latter by DA / NIA.
The member of the PMO for flood control component will be the representative of NWRB, PAGASA, and LGUs.
The member of the PMO for irrigation component will be DA / NIA and LGUs.
- d) Sub-Project Management Office (Sub-PMO)
Sub-PMOs will be set-up in each sub-component of the project such as:

Sub-PMO for Flood control component:

- Flood control structural measures: DPWH, PMO-MFCDO & Regional Office R-2
- FFWS: PAGASA and DPWH
- Evacuation center and other facilities: DPWH and Disaster Coordinating Councils
- Resettlement area development: DPWH and DA with LGUs (Some resettlement will also be needed in Irrigation project implementation)

Sub-PMO for Irrigation Component:

- Irrigation system construction: DA / NIA
- Supporting measures: DA / NIA
- Most important activity of the Sub-PMO for supporting measures is to promote the livelihood program for resettled people

4.2.3 Implementation Schedule of Preparatory Works

Construction schedule for the 1st Phase works has been presented in the previous Chapter. Herein presented is specifically for preparatory arrangement of the Implementation.

(1) Preparatory Works Required

For the smooth commencement of the project implementation, the following preparedness is essential. This statement is given on the assumption that the GOP will look for the financial assistance from foreign lending institutions since this project seems to be big in terms of the project cost beyond the financial capacity of the GOP.

1) Review of law and regulation

As described in Chapter 2, there are some problems in the current law and regulations. To eliminate such problems in the implementation of this proposed projects, existing and current law and regulations should be reviewed and revised regulation should be enforced immediately. The necessary revisions, which are urgently needed to be enforced, are enumerated below.

- a) Designation of Major Rivers together with river administration for the Cagayan River
- b) Definitions and designations of river area and flood control area
- c) Use of land in river area to eliminate illegal settlement there

- 2) Memorandum of agreement (MOA) among the agencies concerned
 - a) MOA between DPWH and LGUs concerned
 - b) MOA among the DPWH and related National Government concerned
- 3) Clearance of the river area
 - a) Relocation of people to be affected by the construction works
The agreement with the people to resettle in the other areas will be at least necessary before asking foreign assistance. The commitment of foreign assistance may be made after confirmation of the people's agreement.
 - b) Land acquisition plan including land ownership survey.
- 4) Preparation of organizational set-up for the project implementation
Preparation of organizational se-up so that it can be realized immediately after the project implementation is decided.
- 5) Preparation of Implementation Program for asking foreign financial assistance
- 6) Other necessary arrangement in accordance with current regulation of GOP such as ICC clearance, ECC clearance, etc.

(2) Schedule of Preparatory Works

As presented in the previous Chapter, the financial arrangement should be completed by the end of 2002 next year. To achieve this target, all the preparatory works above mentioned should be completed by the middle of 2002 at the latest.

It is recommended that GOP take necessary actions immediately since no time allowance is available.

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Tables

Table 2.2.1 2001-2004 Medium-Term Public Investment Program (MTPIP)

SUMMARY

Department: DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS

(Million Pesos)

Projects	Funding Source	2001			2002			2003			2004			Total 2001-2004			%
		GOP	Loan/Grant	Total	GOP	Loan/Grant	Total	GOP	Loan/Grant	Total	GOP	Loan/Grant	Total	GOP	Loan/Grant	Total	
I. HIGHWAYS		16,184	5,694	21,878	16,614	10,614	27,228	23,628	13,724	37,352	25,946	17,518	43,464	82,372	47,550	129,922	65.8
a. National Arterial Road		6,698	4,261	10,959	8,519	7,598	16,117	12,255	10,389	22,644	12,989	11,140	24,129	40,461	33,388	73,849	37.4
a.1 Foreign-assisted		2,706	4,261	6,967	4,558	7,598	12,156	6,366	10,389	16,755	5,200	11,140	16,340	18,830	33,388	52,218	
a.2 Locally Funded		3,992		3,992	3,961		3,961	5,889		5,889	7,789		7,789	21,631	-	21,631	
b. National Secondary Road		7,204	417	7,621	4,894	1,288	6,182	8,477	1,483	9,960	9,882	3,248	13,130	30,457	6,436	36,893	18.7
b.1 Foreign-assisted		211	417	628	548	1,288	1,836	827	1,483	2,310	1,967	3,248	5,215	3,553	6,436	9,989	
b.2 Locally Funded		6,993		6,993	4,346		4,346	7,650		7,650	7,915		7,915	26,904		26,904	
c. National Bridges		2,282	1,016	3,298	3,201	1,728	4,929	2,896	1,852	4,748	3,075	3,130	6,205	11,454	7,726	19,180	9.7
c.1 Foreign-assisted		1,148	1,016	2,164	1,396	1,728	3,124	1,583	1,852	3,435	1,687	3,130	4,817	5,814	7,726	13,540	
c.2 Locally Funded		1,134		1,134	1,805		1,805	1,313		1,313	1,388		1,388	5,640		5,640	
II. FLOOD CONTROL		3,492	1,855	5,347	3,934	3,145	7,079	4,649	3,200	7,849	5,248	3,298	8,546	17,323	11,498	28,821	14.6
a. Foreign-assisted		767	1,855	2,622	1,284	3,145	4,429	1,356	3,200	4,556	1,626	3,298	4,924	5,033	11,498	16,531	
b. Locally Funded		2,725		2,725	2,650		2,650	3,293		3,293	3,622		3,622	12,290		12,290	
III. OTHER DPWH PROJECTS 1/		7,580	171	7,751	8,167	144	8,311	11,282	-	11,282	11,330	-	11,330	38,359	315	38,674	19.6
a. Foreign-assisted		105	171	276	14	144	158			-	11,330		11,330	11,449	315	11,764	
b. Locally Funded		7,475		7,475	8,153		8,153	11,282		11,282			0	26,910		26,910	
Grand-Total		27,256	7,720	34,976	28,715	13,903	42,618	39,559	16,924	56,483	42,524	20,816	63,340	138,054	59,363	197,417	100.0

Note: 1/Includes national buildings, engineering, facilities for gender and development, accessibility for disabled, various infrastructure including local roads and water supply under LGEF.

Table 3.5.1 Supporting Measures for Structural and Non-structural Measures

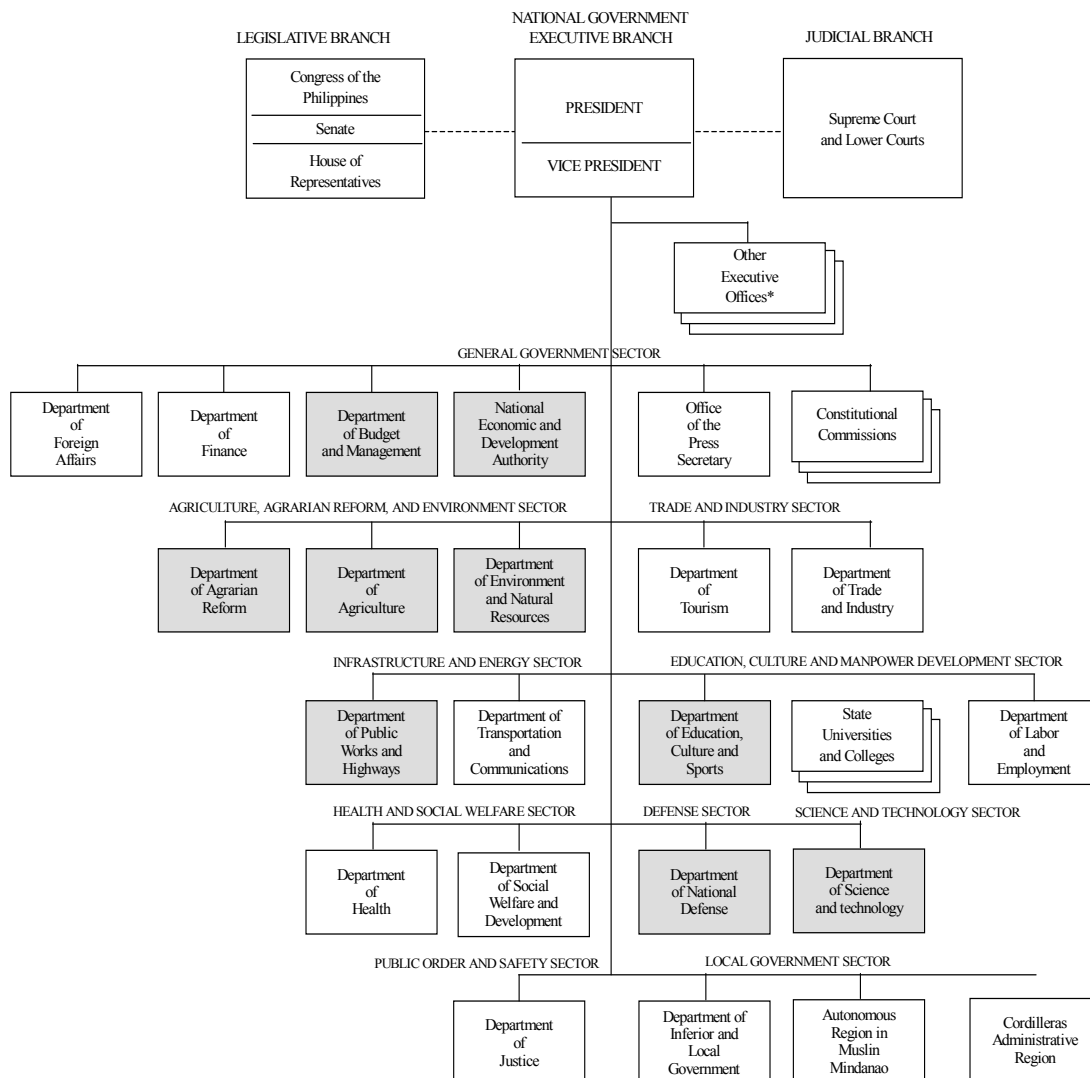
No.	Items	Project Category			Major Work Contents	Action Takers		Consultant
		FC St.	FC N-St	IRR		Leading Agency	Support. Agencies	
I.	Before construction							
(1)	Revision of IRR of Water Code				Water Code to be reviewed / revised / added	NWRB		
	a) River areas & Flood control area	⊙	⊙	⊙	Clarification and designation			○
	b) Responsibility of agencies concerned	⊙	⊙	⊙	To clarify			
(2)	Relocation / Resettlement	⊙	⊙	⊙	Agreement of people	LGUs	DPWH / NIA / DILG	○
(3)	Land acquisition	⊙	⊙	⊙	Agreement of people	LGUs	DPWH / NIA / DAR	○
(4)	Compensation	⊙	⊙	⊙	Agreement of people	LGUs	DPWH / NIA / DAR	○
(5)	Implementation organization	⊙	⊙	⊙	To be newly created			
(6)	Financial arrangements	⊙	⊙	⊙	Foreign assistance needed	DPWH / NIA / LGUs		○
(7)	Decentralization program		⊙		Reinforcement of FFWS Sub-center	PAGASA		○
(8)	Supporting system for farmers		⊙	⊙	Trading system, micro credit system, etc	LGUs / DAR	DA / NIA / DAR	○
II.	During construction							
(1)	Selection of contractor	⊙	⊙	⊙	Standard criteria existing	DPWH / NIA / PAGASA / LGUs		○
(2)	Construction supervisor	⊙	⊙	⊙	Standard criteria existing	DPWH / NIA / PAGASA / LGUs		○
(3)	Operation & maintenance	⊙	⊙	⊙	Manual to be prepared	DPWH / NIA / PAGASA / LGUs		○
III.	After construction (OM Stage)							
(1)	Monitoring system of infrastructure	⊙	⊙	⊙	To be prepared during construction stage	NWRB	DPWH / NIA / LGUs	○
(2)	Rehabilitation program	⊙	⊙	⊙	As needed			
(3)	Evacuation system		⊙		Disaster preparedness manual to be prepared			○
(4)	FFWS		⊙		Operation manual, training of operator	PAGASA	DPWH / NIA / LGUs	○
(5)	Resettlement		⊙	⊙	Operation manual to be prepared			○
IV.	Common							
(1)	Community awareness building	⊙	⊙	⊙	Public hearing, consultation meeting, etc	DPWH / NIA / LGUs		○
(2)	Community participation	⊙	⊙	⊙	To clarify	LGUs		○
(3)	Improvement of livelihood		⊙	⊙	To clarify			○

FC St. : Flood control project, Structural Measure
 FC N-St: Flood control project, non-structural measure
 IRR: Irrigation project

⊙ Corresponding Project category
 ○ Consultant to be employed

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Figures



* Other Executive Offices

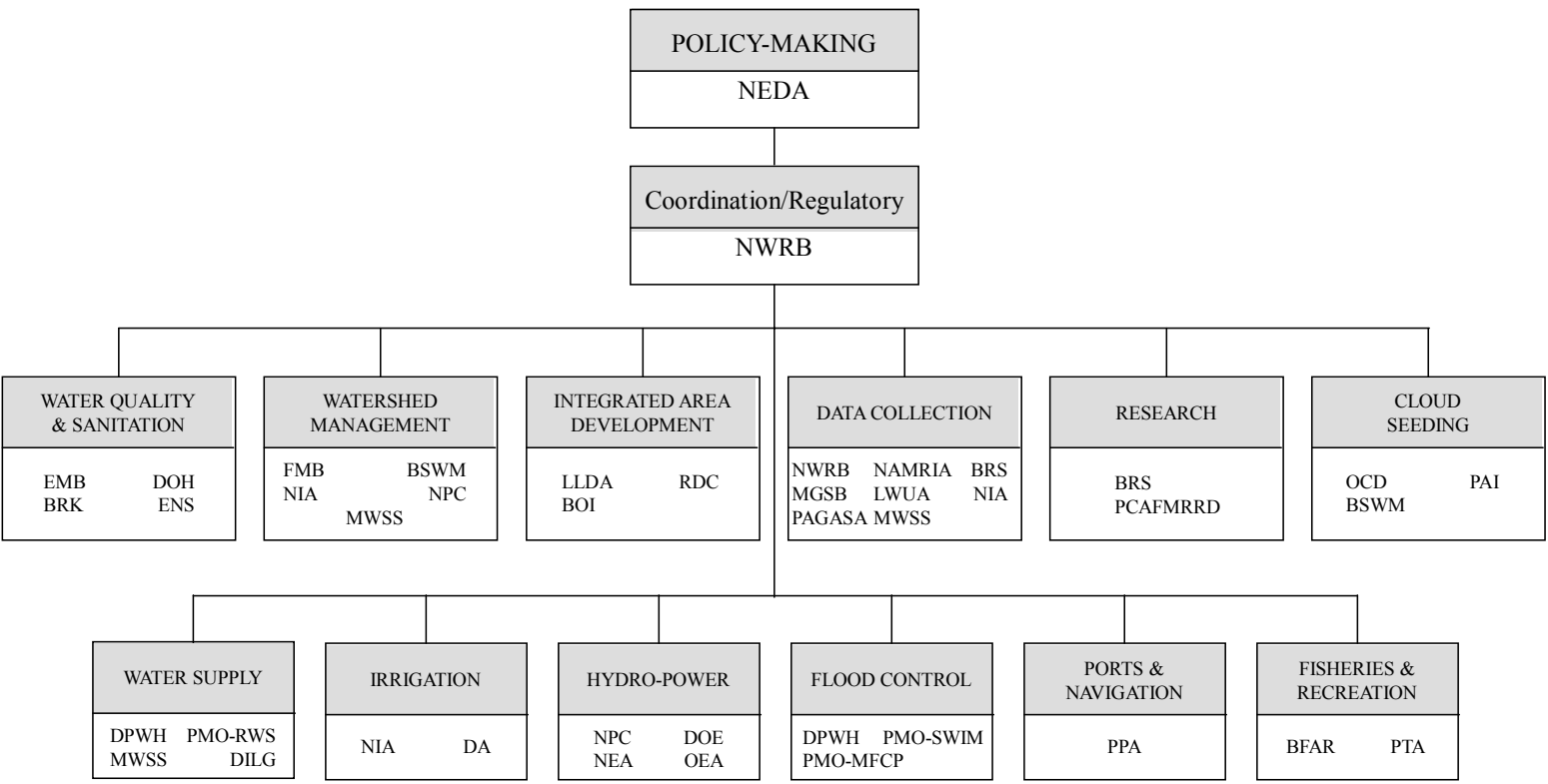
- | | | | |
|---|--|---|--|
| 1. Commission on Philippines Overseas | 11. Movie and Television review and Classification Board | 19. Office of Energy Affairs | 29. Presidential Commission for the Urban poor |
| 2. Commission on Population | 12. Metropolitan National Authority | 20. Office of Muslim Affairs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

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JAPAN INTERNATIONAL COOPERATION AGENCY

Figure 2.2.1

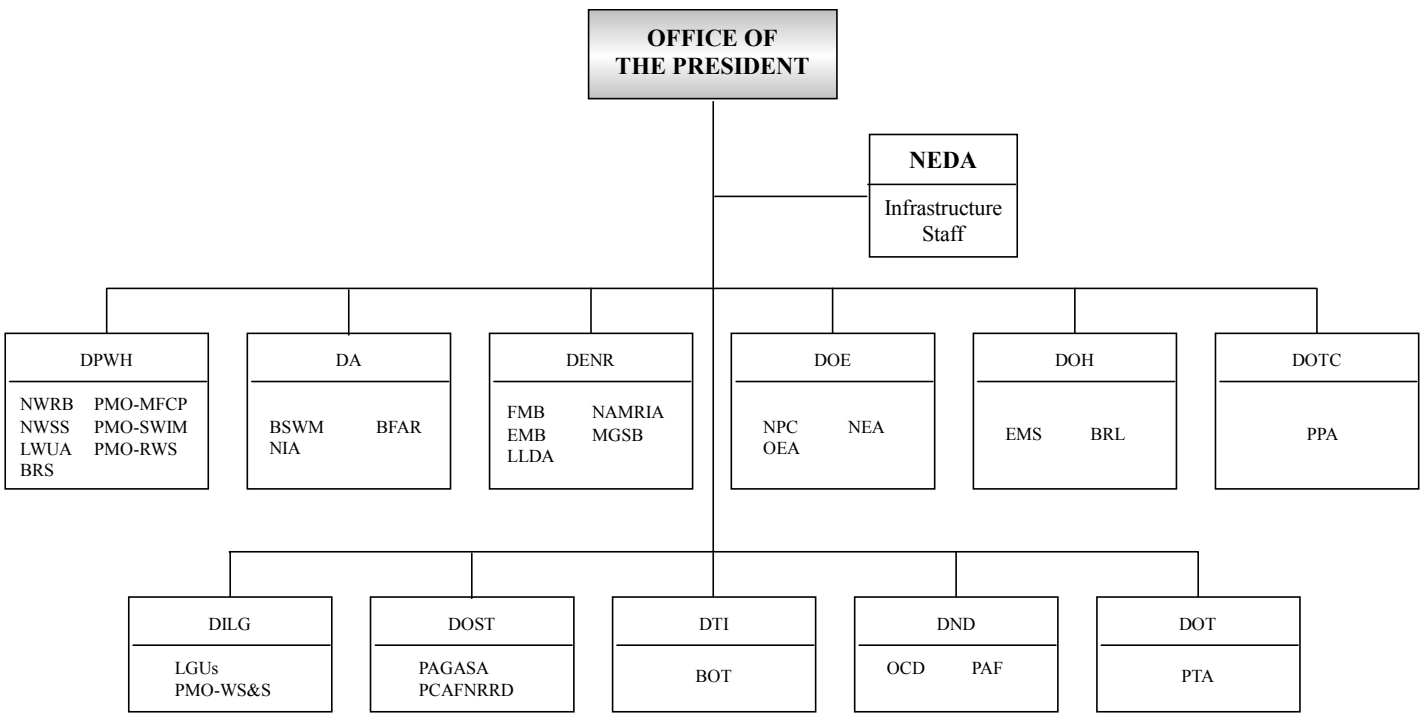
Organisation Chart of the Philippine Government



*The Feasibility Study of the Flood Control Project
for the Lower Cagayan River
in the Republic of the Philippines*

JAPAN INTERNATIONAL COOPERATION AGENCY

Figure 2.2.2
**Functional Relationship for
Water Related Works**

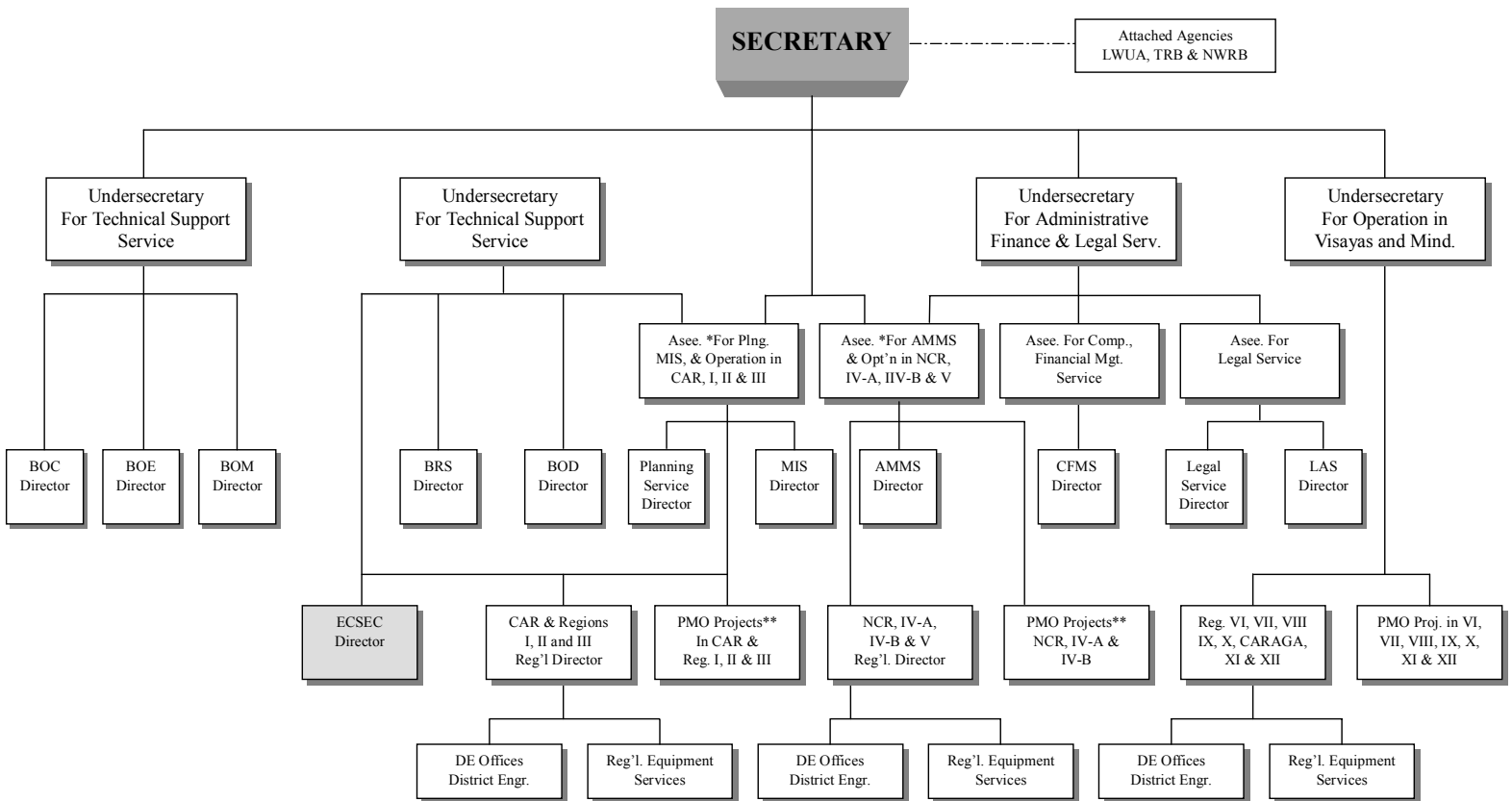


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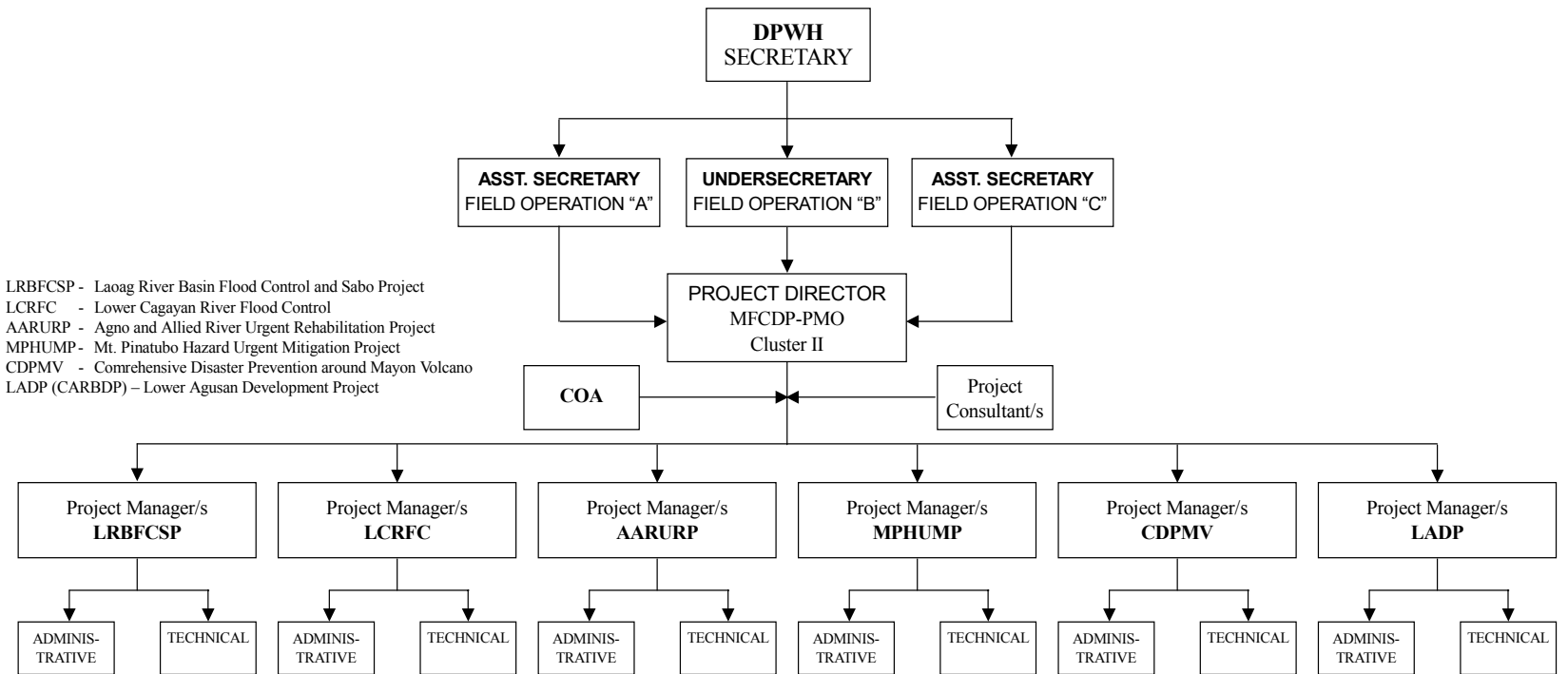
Figure 2.2.3
**Organizational Relationship for
Water Related Works**

Figure 2.2.4
Organizational Chart Department
of Public Works and Highways



* Reports to the concerned Undersecretary for matters on Services under them and directly to the Secretary for matters concerning regional operations.
** PMO Heads report to the Undersecretary and two Assistant Secretaries for operations depending on the specific geographic jurisdiction of their projects.

Republic of the Philippines
 Department of Public Works and Highways
 Project Management Office



LRBFCSP - Laoag River Basin Flood Control and Sabo Project
 LCRFC - Lower Cagayan River Flood Control
 AARURP - Agno and Allied River Urgent Rehabilitation Project
 MPHUMP - Mt. Pinatubo Hazard Urgent Mitigation Project
 CDPMV - Comprehensive Disaster Prevention around Mayon Volcano
 LADP (CARBDP) - Lower Agusan Development Project

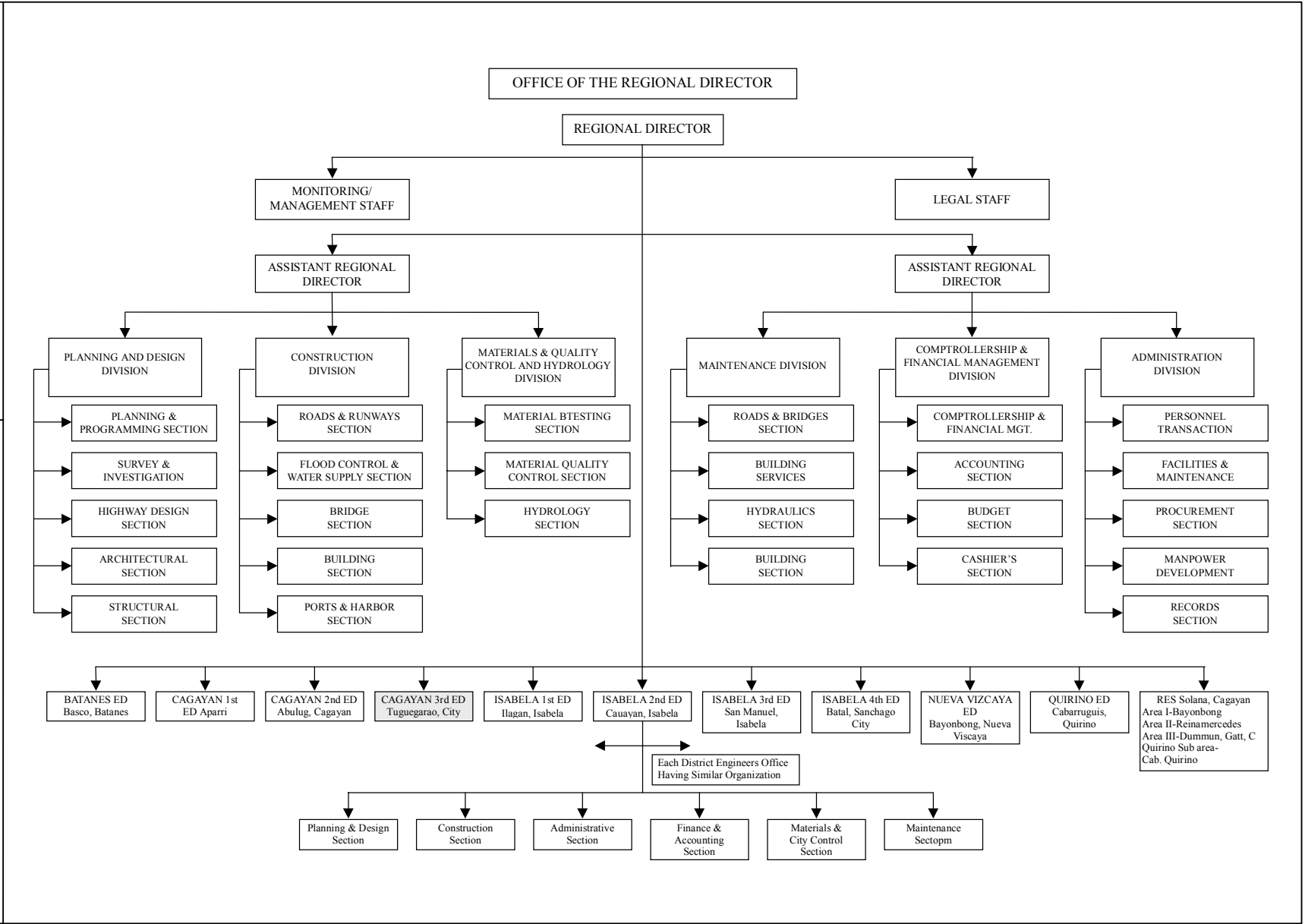


Figure 2.2.7
**Organizational Chart of DPWH Regional
Office, Region 2 (Regional Equipment Service)**

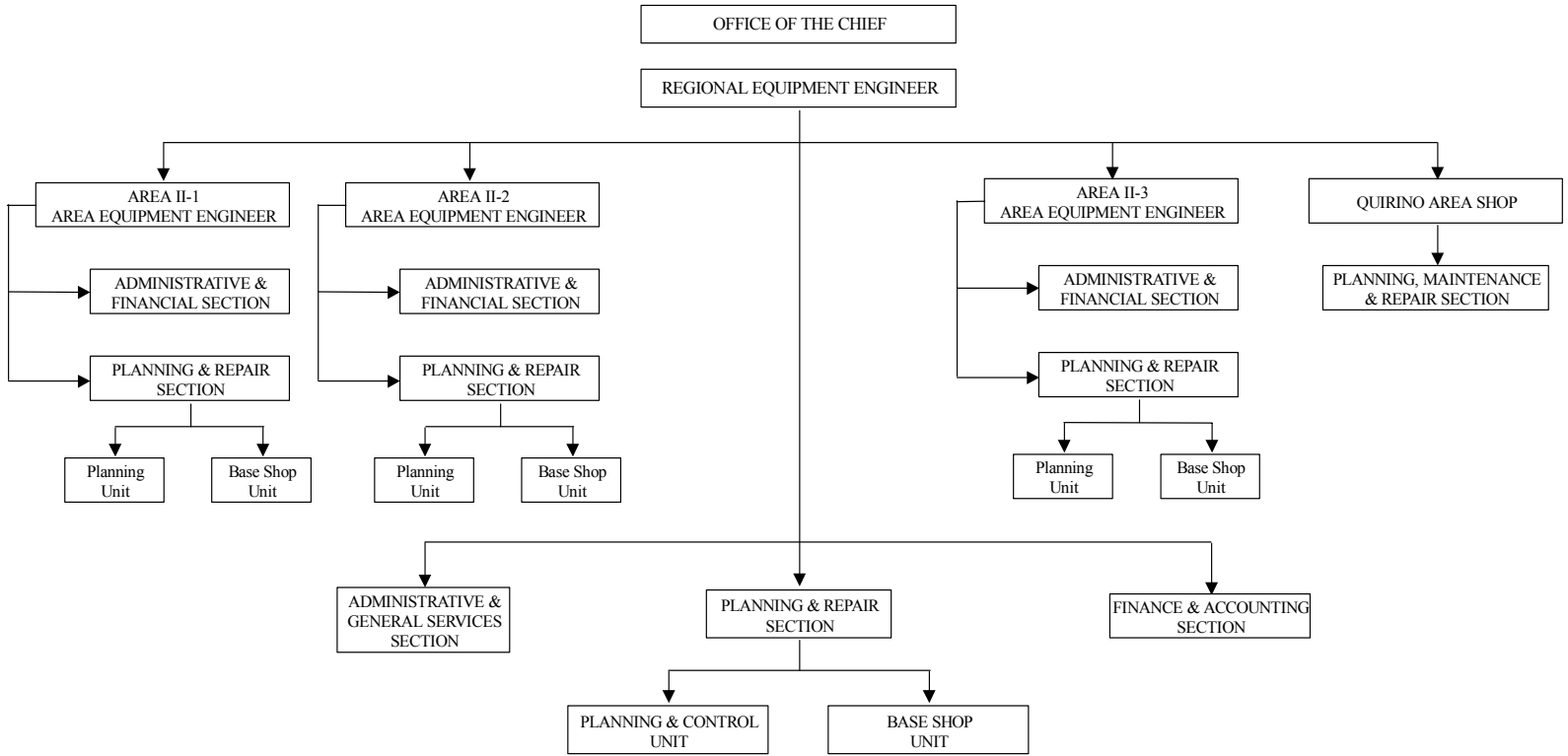


Figure 4.1.1
**Organization Chart of Cagayan
River Basin Development**

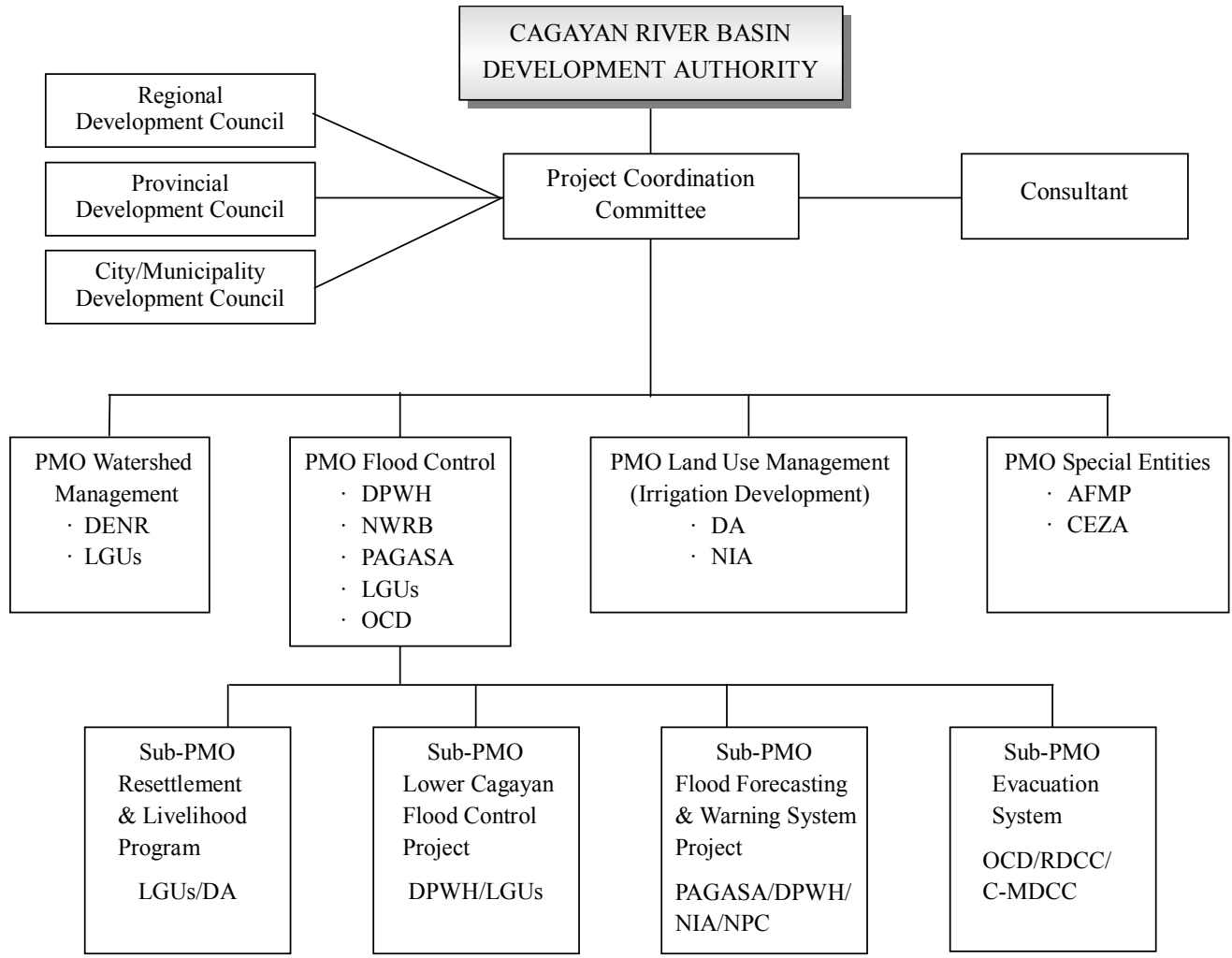


Figure 4.2.1
Lower Cagayan Flood Control Project Organization Chart for 1st Phase Project Implementation

