

添付資料集

APPLICATION FOR JAPAN'S GRANT AID

GENERAL AND FISHERIES

1. Date of Entry : month July year 2002
2. Applicant : The Government of the Philippines
3. Project Title : Rehabilitation of Flood Forecasting and Warning System in the Pampanga and Agno River and Basins
4. Sector : Disaster Prevention (Flood Forecasting)
5. Project Type : Equipment Supply
6. Target Site : Pampanga and Agno River Basin, Region I and III
(See Figures 1 and 2)
7. Requested Amount: Y 605,000,000
8. Desired Fiscal Year of Implementation:

Survey:	FY 2002
Implementation:	FY 2003
9. Implementing Agency:

Department of Science and Technology (DOST)
Philippine Atmospheric, Geophysical and Astronomical Services
Administration (PAGASA)

Person-in-Charge :	Leoncio A. Amadore Director, PAGASA
Address :	WFFC Bldg., BIR Road, Diliman Quezon City 1104
Telephone No. :	929-4865

10. Outline of the Implementing Agency

(1) Function

(a) PAGASA

The Philippine Atmospheric, Geophysical and Astronomical Services Administration is mandated to mitigate or reduce the losses to life, property and the economy of the country occasioned by typhoon, floods, droughts and other destructive weather-related disturbances. The organizational chart of PAGASA is shown in Figure 3.

(b) FFB

The Flood Forecasting Branch undertakes operational activities in flood forecasting and warning in major river basins in the country through a network of telemetering and telecommunication systems; develops systems and facilities necessary to carry out these functions including the techniques and methods used; and coordinate with the Department of Public Works and Highways and other related agencies concerned with flood mitigation and control as shown in Figure 4. The Flood Forecasting and Warning Systems (FFWSs) covers mainly the Pampanga, Agno, Bicol and Cagayan (PABC) river basins including the major reservoirs in Luzon, namely, Angat, Pantabangan, Binga/Ambuklao and Magat, among others. The organizational structure of the FFB is depicted in Figure 5 while the overall system network of the Flood Forecasting and Warning System (FFWS) and the Flood Forecasting and Warning System for Dam Operation (FFWSDO) is shown in Figure 6.

(c) PABC-FFWC

The PABC River Basin Flood Forecasting and Warning Centers (PABC-FFWC) monitors the basin's meteorological and hydrological conditions for hydrologic/flood forecasting and warning; conducts/participates in hydrologic/hydrographic survey and data measurements and cross-sectioning, and post flood investigation for the basins; and operates and maintains the basin's telemetering system including electro-mechanical and gauging equipment, gauging stations and other facilities.

(2) Budget and Staff

(a) PAGASA

Year	1997	1998	1999	2000
Annual Budget (In thousand pesos)	429,233	490,233	378,463	334,476
Number of Staff	1,358	1,342	1,297	1,547

(b) FFB

Year	1997	1998	1999	2000
Annual Budget (In thousand pesos)	37,576	34,691	39,597	43,110
Number of Staff	98	86	87	89

(c) PABC-FFWC

Year	1997	1998	1999	2000
Annual Budget (In thousand pesos)	2,180	2,448	2,288	2,876
Number of Staff				
Pampanga-FFWC	5	5	5	5
Agno-FFWC	5	5	5	5

(3) Organizational Structure

The Organizational set-ups of PAGASA and FFB are shown in Figures 3 and 5.

II. Background of the Request

(1) Flood Disaster Situation

The Philippines, being situated in the typhoon belt, experiences an annual average of 19 tropical cyclones. The mean annual rainfall varies from 1000 mm to 4000 mm in various regions of the country. There are 421 principal river basins, 20 of which are considered major river basins. Based from the records of the Office of Civil Defense (OCD), these basins experience floods impacting upon the people, throwing development momentum off course.

In the Agno river basin, floods have been recurrent during the past 65 years. The flood of 1935 recorded the largest inundation area while the flood of 1972, the second largest, inundated more than 80% of the flood-prone area and incurred a total damage of P2 billion in Central Luzon. During the August 1984 flood (TY Maring), the Carmen bridge, a major thoroughfare in Pangasinan collapsed and the total damage reached P99 million. The flood in 1986 inundated an area of 200,000 ha and damage amounted to about P134 million. It is reported that 69 people lost their lives in the Agno river basin from 1982 to 1986. The flooding problem has reached menacing proportions when the 1990 earthquake brought about staggering effects such as massive erosions, liquefaction, siltation, sand boil and subsidence. In addition, the eruption of Mt. Pinatubo in 1991 and the years thereafter has caused the intrusion of lahar in the middle and lower reaches of the basin via the Tarlac river. These all translate into considerable economic losses. The flood in July 1996 (TY Gading) resulted to loss of human lives (5) and massive damage in agriculture and infrastructure (P1 billion). In September 1998, the passage of TS Gading caused flooding which incurred a total damage of about P2.9 billion.

The Pampanga river basin, the third largest basin in the Philippines had also its share of flooding problems with at least two big floods a year. Just like the Agno river basin, the flood disaster situation became critical as a result of the 1990 earthquake and the 1991 eruption of Mt. Pinatubo. Siltation of river channels has decreased the capacity of the river thus increased the frequency of flooding and aggravated the flooding condition of the basin. In 1995 and 1997, the big floods that occurred in the basin inundated about 5,000 ha of the area. The extent of inundation had reached areas that are not normally flooded before the eruption.

(2) Flood Forecasting and Warning Situation

Recognizing the need for operational flood forecasting and warning to help mitigate considerable damage brought about by annual occurrences of flooding, the government considered in the early 70s the establishment of a flood forecasting and warning system (FFWS) in the country's major river basins. The FFWS was first introduced in 1968 when the Typhoon Committee Secretariat was established in the Philippines. The implementation of the pilot project was first initiated as a JICA Grant Project covering the Pampanga river basin in 1973 with the aim at mitigating flood damage in the Pampanga Delta. The warning system proved to be effective

during subsequent major floods and this led to the establishment of a similar flood forecasting and warning systems covering the Agno, Bicol and Cagayan (ABC) river basins. These FFWS were implemented in 1983 with the financial support of the Government of Japan under its Official Development Assistance (ODA) Program using facilities of its Overseas Economic Cooperation Fund (OECF).

After the disastrous 1978 flood that wreaked destruction and death downstream of the Angat dam in Bulacan, authorities saw the need for a FFWS at the major dam sites. The Flood Forecasting and Warning System for Dam Operation (FFWSDO) was therefore considered to prevent recurrence of similar disaster. The objectives of the FFWSDO Project were to provide necessary information for the safe and cost effective operation of the existing five (5) major dams in Luzon and to forewarn the people in the flood plains downstream of these dam sites of impending release of impounded water through the spillways during floods. The FFWSDO is a two-staged (Phases I & II) project which started in April 1983 and was funded by OECF. Phase I which included the establishment of FFWS covering the Angat and Pantabangan areas was completed in July 1986 while Phase II which covered Binga/Ambuklao and Magat areas was operational in 1992. The overall system network of FFWSs is shown in Figure 6.

With the establishment of the FFWSs, the real time data measured by rainfall and water level gauging stations in the basin are transmitted through telemetry and telecommunication facilities to the PAGASA Flood Forecasting central office. With the real time data, PAGASA is able to predict the flooding in the area and provide the necessary warning information to the residents for evacuation and other precautionary measures.

(3) Importance of FFWS

The FFWS is an effective non-structural measure for disaster mitigation and preparedness. The construction of dikes and dams and other structures are indispensable measures in flood control. However, it becomes more effective if a judicious mix of both the structural and non-structural measures is introduced. Flood forecasting is considered to be most economical compared with any structural measures.

(4) Necessity of the Project

In the last 10-20 years, there has been a lot of changes affecting the effectiveness of the Agno and the Pampanga FFWS. The earthquake in 1990 (with epicenter along the northeastern part of the basin), the eruption of Mt. Pinatubo in 1991 and the recurrent floods in the target areas of these basins have enormously changed the geomorphology and the hydrological characteristics of the rivers in particular and the basin in general. Deforestation and heavy siltation including lahar that affected some of the Pampanga and Agno river channels or cause change in the river courses have reduced the carrying capacity of the rivers and therefore increased the frequency of flooding in the target areas. A significant number of the existing equipment and facilities have become obsolete and have deteriorated, which made the system very difficult to maintain.

Within the Agno river basin, the San Roque Multi-Purpose dam will soon be completed and start filling in its reservoir in July 2002. Considering the capacity of the dam and its proximity to the Pangasinan Plain, the rehabilitation of the existing Agno FFWS is necessary and very urgent to ensure the safety of the people and infrastructure in the target area from flooding.

It is therefore highly recommended that the Pampanga FFWS and the Agno FFWS be rehabilitated in order to be effective in providing timely and accurate flood forecasting and warning services.

(5) Necessity of Japanese Grant Aid

Japanese grant aid is requested for the following reasons:

- (1) The project aims at disaster prevention.
- (2) Japan is known for its state-of-the-art technology with respect to rainfall and water level monitoring and effective flood forecasting and warning system.
- (3) In the Pampanga and Agno river basins where urbanization and population growth has progressed significantly during the past 10 years, timely and accurate flood forecasts and warning is a must. Likewise, the Pampanga FFWS is the pilot FFWS in the Philippines under the JICA Grant Aid Project in 1973 and the operationalization of the San Roque Multi-Purpose dam would require the rehabilitation of the Agno FFWS.
- (4) Local funding is very limited due to the recent devaluation of local currency (Peso) and regional economic crisis.

12. Relation with the Government's Development Plan and Other Factors

(1) Relation with the government's national development plan

Name of Plan	:	Infrastructure Development Plan
Period	:	1999 to 2004

The Infrastructure Development Program is designed primarily to mitigate flood damages through structural and non-structural measures. The proposed project which is basically flood forecasting and warning is among the non-structural measures of reducing flood damage.

(2) Relation with other sector's comprehensive/overall program

Please refer the above relation with the government's national budget.

13. Objectives of the Project

(1) Objectives / purpose of the project

To rehabilitate the Agno and Pampanga FFWS in order to provide timely and accurate flood forecasts and warnings to meet the needs of the beneficiaries through:

- Rehabilitation of telemetering system;
- Restoration of Computer system;
- Supply of spare parts and O&M equipment;

(2) Overall Goal /medium and long-term objectives.

The final goal is to minimize flood-related disasters in the Pampanga and the Agno river basins through effective flood forecasting and warning, as a complementary measure with structural flood control activities.

14. Outline of the Project and Request (Itemize as concretely as possible.)

(1) Engineering Services

(a) Detailed Design

The design of rehabilitation of telemetering system will be carried out together with the preparation of specification and tender documents. A Consultant will assist in the pre-qualification and tendering procedure.

(b) Supervision

The manufacturing and installation of equipment and construction of station will be supervised by a consultant.

(c) Model Operation / Training

A model operation of equipment installed will be carried out together with the training staff of PAGASA.

(2) List of requested equipment and Estimated Cost

Please refer to Annexes 1-2.

(3) Additional Information

(a) Existing Facilities:

The Pampanga and Agno River basin FFWS consist of rainfall and water level gauging stations and telemetering network connecting relay stations and the FFWS Center in PAGASA. Additional monitoring office has been established at the Department of Public Works and Highways (DPWH). The observed real-time rainfall and water level data are transmitted simultaneously to the PAGASA WFFC, each field centers and the DPWH main office on an hourly interval. Figure 1 & 2 shows the Pampanga and the Agno river basin FFWS

(b) List of existing equipment

Please refer to Figure 6.

(c) Project Site Preparation

Land acquisition for the replacement of stations are to be secured within the first year of the project implementation. Preferably, the stations will be located in government owned land. Power shall be supplied by solar battery for gauging stations. Government provides security in all sites.

(d) Related grant aid cooperation in the past.

FY 1973
Title: Flood Forecasting and Warning System Pilot Project
Amount: Y 65 million
Target area: Pampanga River Basin $\text{P } 65,000,000.00$

FY 1981
Title: Rehabilitation of the Pampanga FFWS
Amount: Y 21 million
Target area: Pampanga River Basin $\text{P } 21,000,000.00$

Assessment on the level of utilization of the project:

 A (Good)
 X B (Passable)
 C (Bad)
 D (Not utilized)

15. Benefit and effects of the project.

(1) Area that will benefit from the project (specify the total area, if possible):

41 municipalities, approximate land area is 2,600 km² (Pampanga)
26 municipalities, approximate land area is 1,260 km² (Agno)

(2) Population that will benefit (directly and indirectly):

Directly : approximately 900,000 (Pampanga)
 : approximately 1,200,000 (Agno)
Indirectly : unaccountable

(3) Expected social and economic effects (itemize concretely):

By means of timely and accurate flood forecasts and warnings, residents will be alerted to take precautionary measures or actions. Flood damages to lives and properties will be reduced thus enhancing the social and economic development of the area.

16. Relation with technical cooperation, etc.

(1) Feasibility study:

None.

(2) Technical cooperation.

One (1) long term expert will be required from October 2000 to October 2002. The expert will provide assistance for the strengthening of the FFWS through site inspection and data collection.

17. Request to other donors for the same project.

None.

18. Aid by third countries or international organizations in the same or related fields.

None.

19. Other information with special remark

Not Applicable.

ANNEX 1

TOTAL COST ESTIMATE

DESCRIPTION	QUANTITY	UNIT PRICE (in Thousand Yen)	TOTAL PRICE (in Thousand Yen)
1. Engineering Services(D/D, S/V, O/M)	L.S.		75,000
2. Rehabilitation of Telemetering System			445,000
(1) Agno System	1	108,000	108,000
(2) Pampanga System	1	166,000	166,000
(3) Monitoring Station(DIC, Agno-fieldcenter, DPWH)	1	171,000	171,000
3. Restoration of Computer System	1	10,000	10,000
4. Spare Parts and Others	1lot		75,000
TOTAL COST ESTIMATE			605,000

BREAKDOWN OF PROJECT DESCRIPTION (1)

Description	Quantity
(1) Rehabilitation of Telemetry System	
(a) Agno System	
- Telemetry Equipment	8 stn.
- Radio Equipment	9 stn.
- Repeater Equipment	1 stn.
- Solar Power Supply System	7 stn.
- Water Level Gauging Equipment (Pressure Type)	6 stn. 在中文小压力
- Replacement of the station building	1 stn. 测站改修 ↑ 建筑物
(b) Pampanga System	
- Telemetry Equipment	14 stn.
- Radio Equipment	17 stn.
- Repeater Equipment	2 stn.
- Solar Power Supply System	13 stn.
- Water Level Gauging Equipment (Pressure Type)	5 stn.
- Replacement of the station building	2 stn.
(c) Monitoring Station	
- Power Supply System (DIC, Agno fieldcenter)	2 stn.
- Telemetry Monitoring and Supervisory Equipment (DIC, Agno fieldcenter, DPWID)	3 stn.
(2) Restoration of Computer System	
- PAGASA DIC	5
- Agno River Flood Forecasting and Warning System	2
- Pampanga River Flood Forecasting and Warning System	2
	↑ 77 / 14 68 ch. 200m?

BREAKDOWN OF PROJECT DESCRIPTION (3)

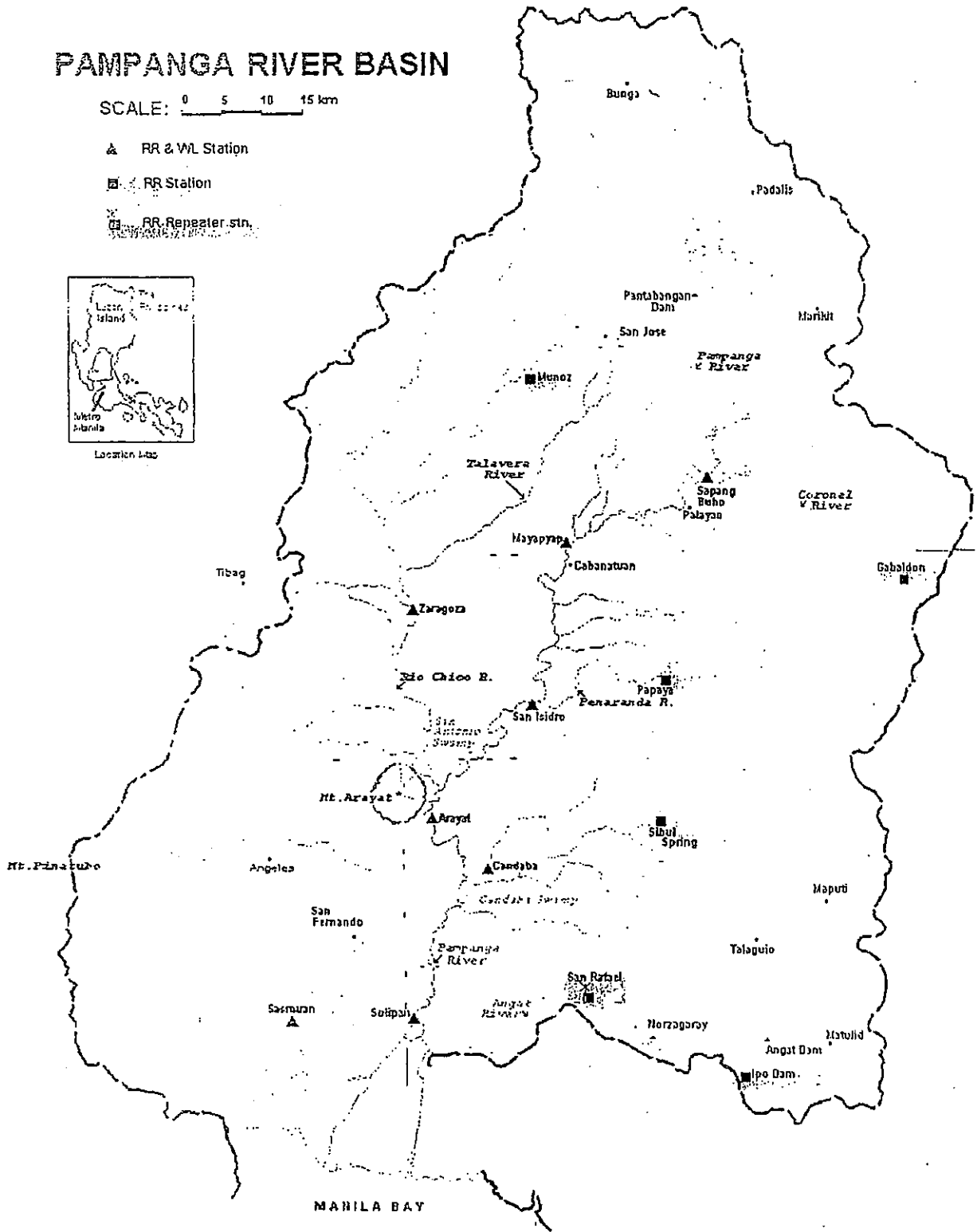
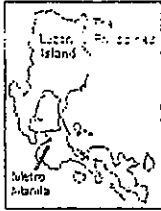
Description	Quantity
(3) Spare Parts and Others	
- Spare parts	L.S.
- Measuring Equipment for System	L.S.
- Maintenance tools	L.S.
- Radio Current Meter	1
- Patrol Cars	5
- GIS Hardware and Software	1

↓
範圍, 目録

PAMPANGA RIVER BASIN

SCALE: 0 5 10 15 km

- ▲ RR & WL Station
- RR Station
- RR Repeater stn.



PHEDUC 2151-10

Figure 1. The Pampanga River Basin

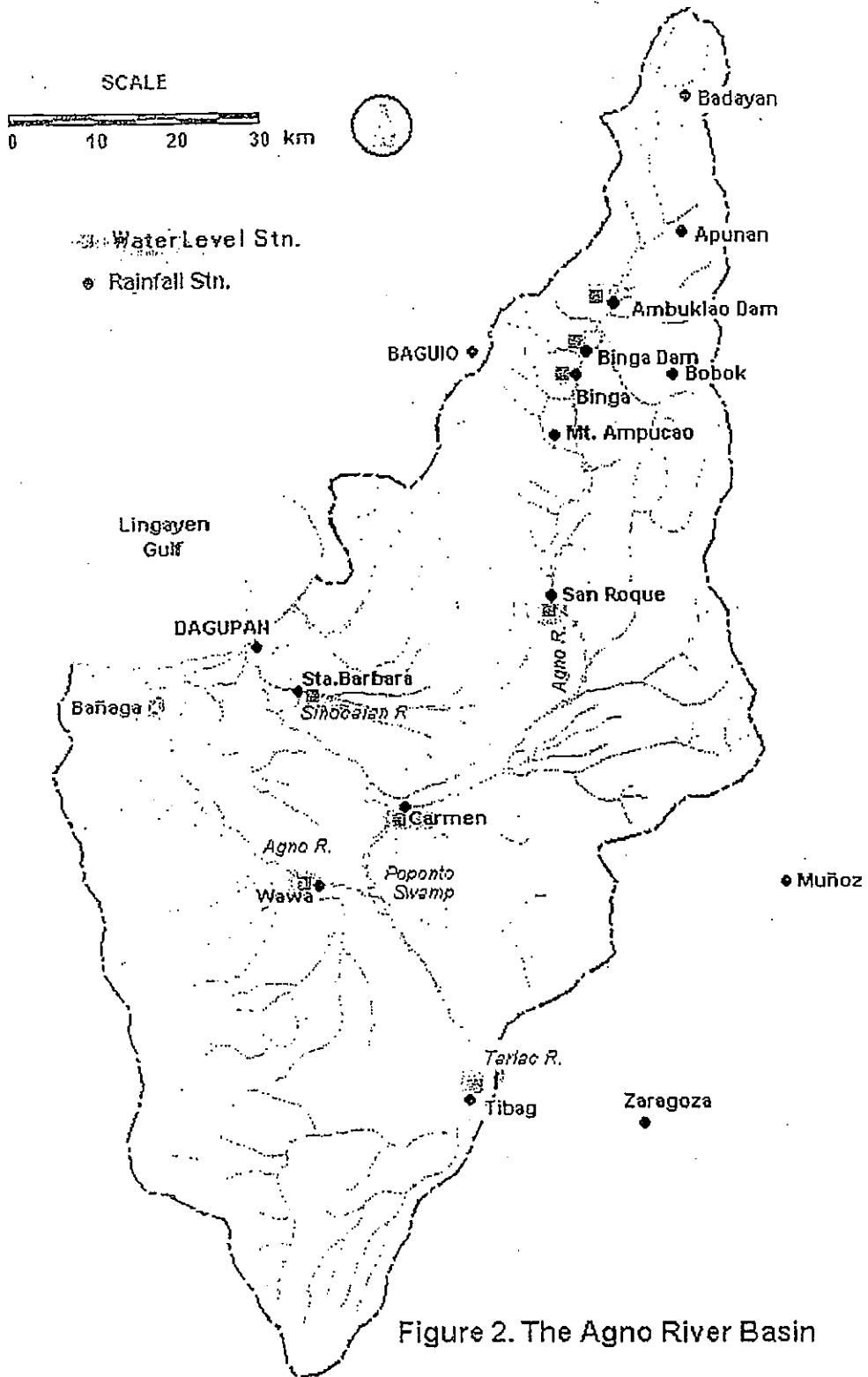


Figure 2. The Agno River Basin

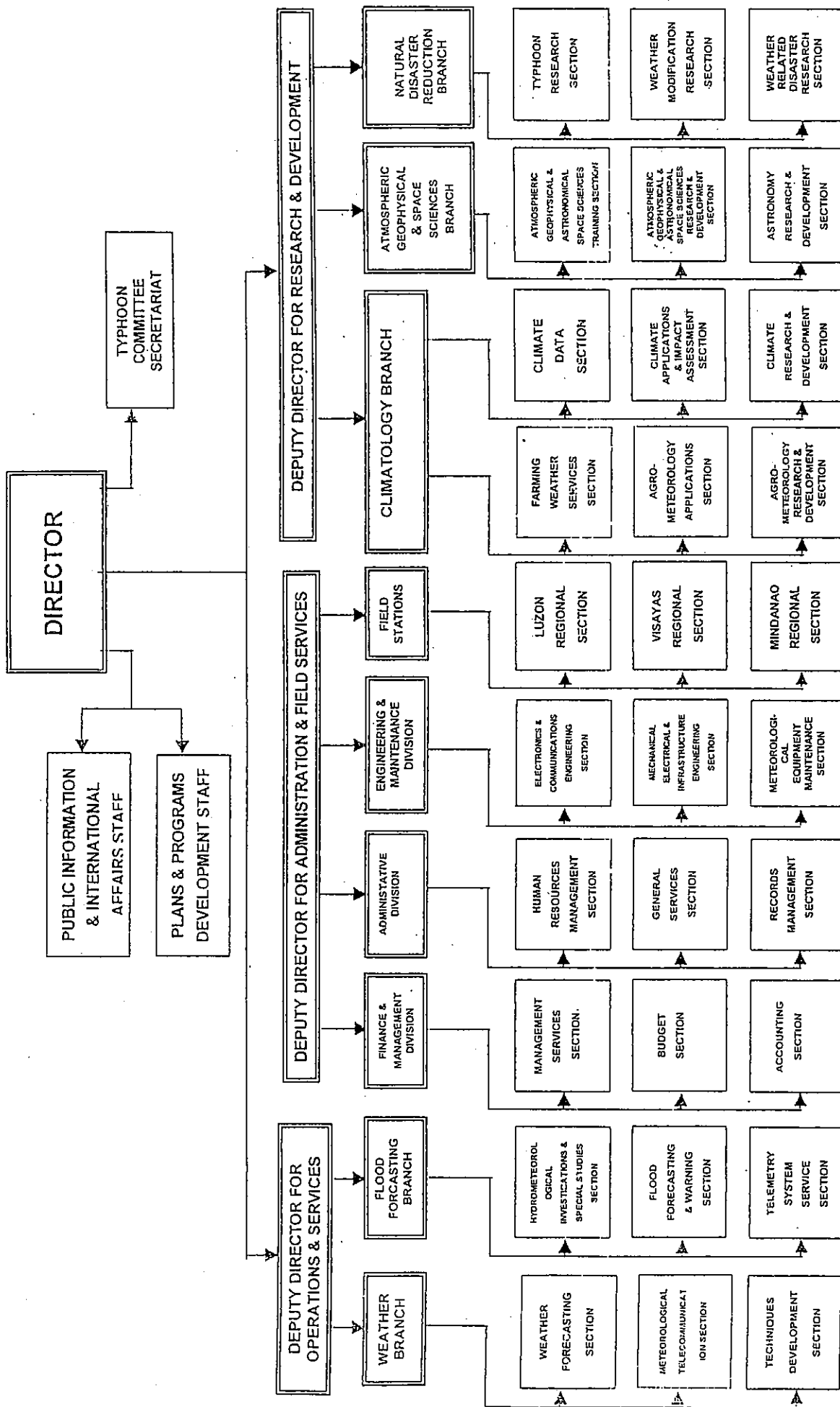


FIG. 3 ORGANIZATIONAL CHART OF PAGASA

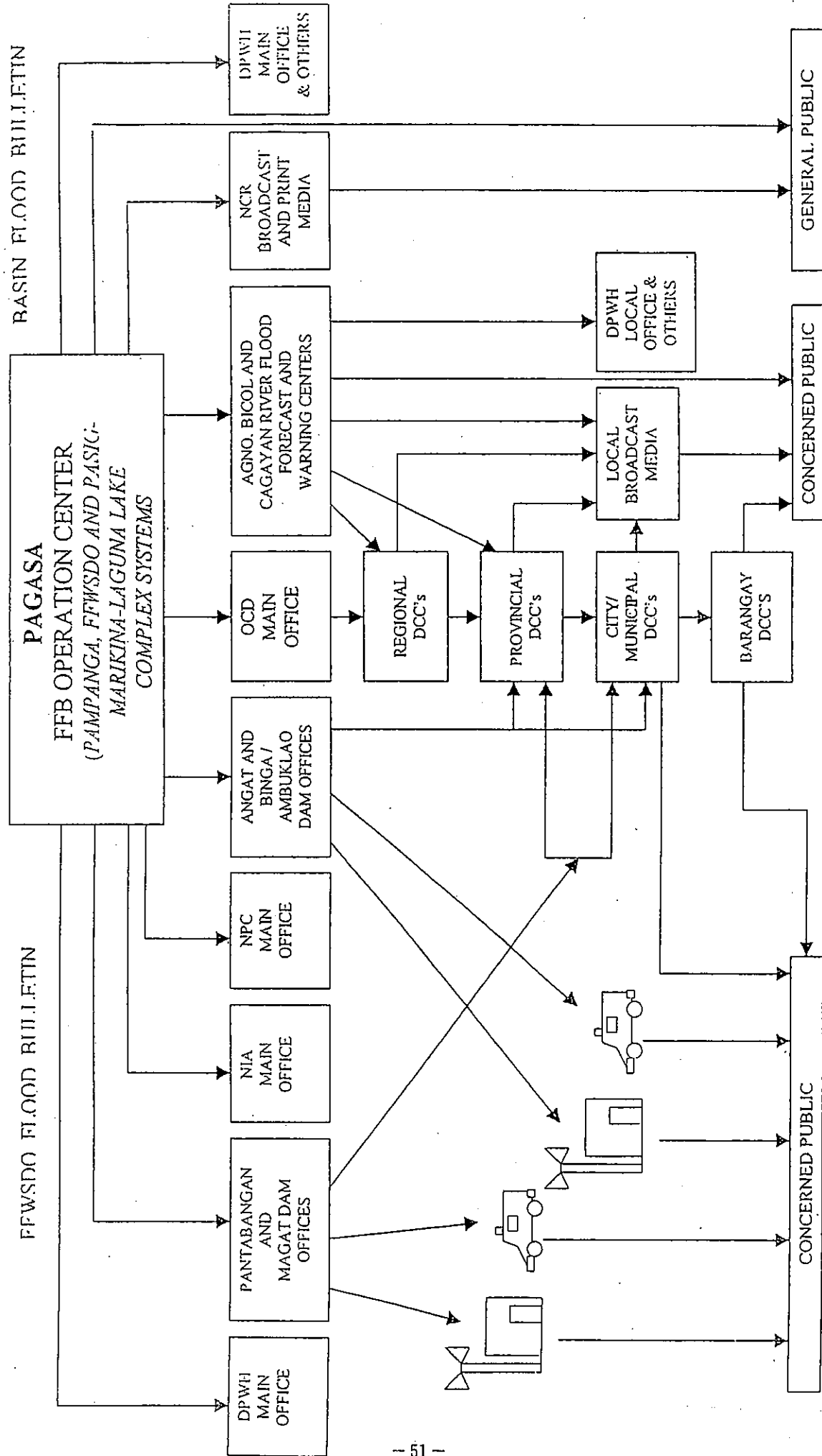


Figure 4 FFWSDO and Basin Flood Bulletins Dissemination Scheme

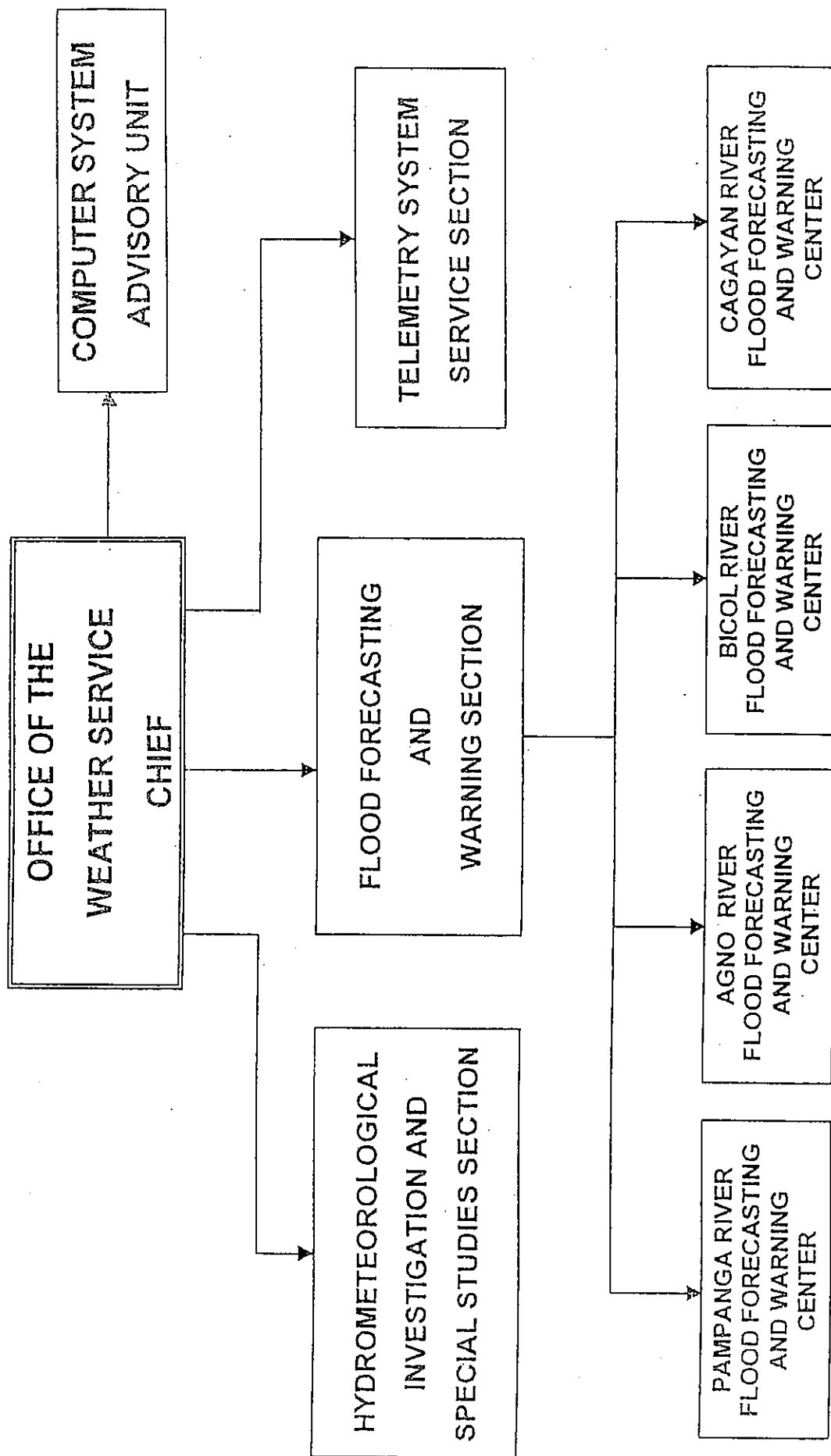


FIG. 5 FLOOD FORECASTING BRANCH ORGANIZATIONAL STRUCTURE

LOCATION MAP

OVERALL SYSTEM NETWORK OF FFWSs (FFWSDO ABC PAMPANGA FFWS)

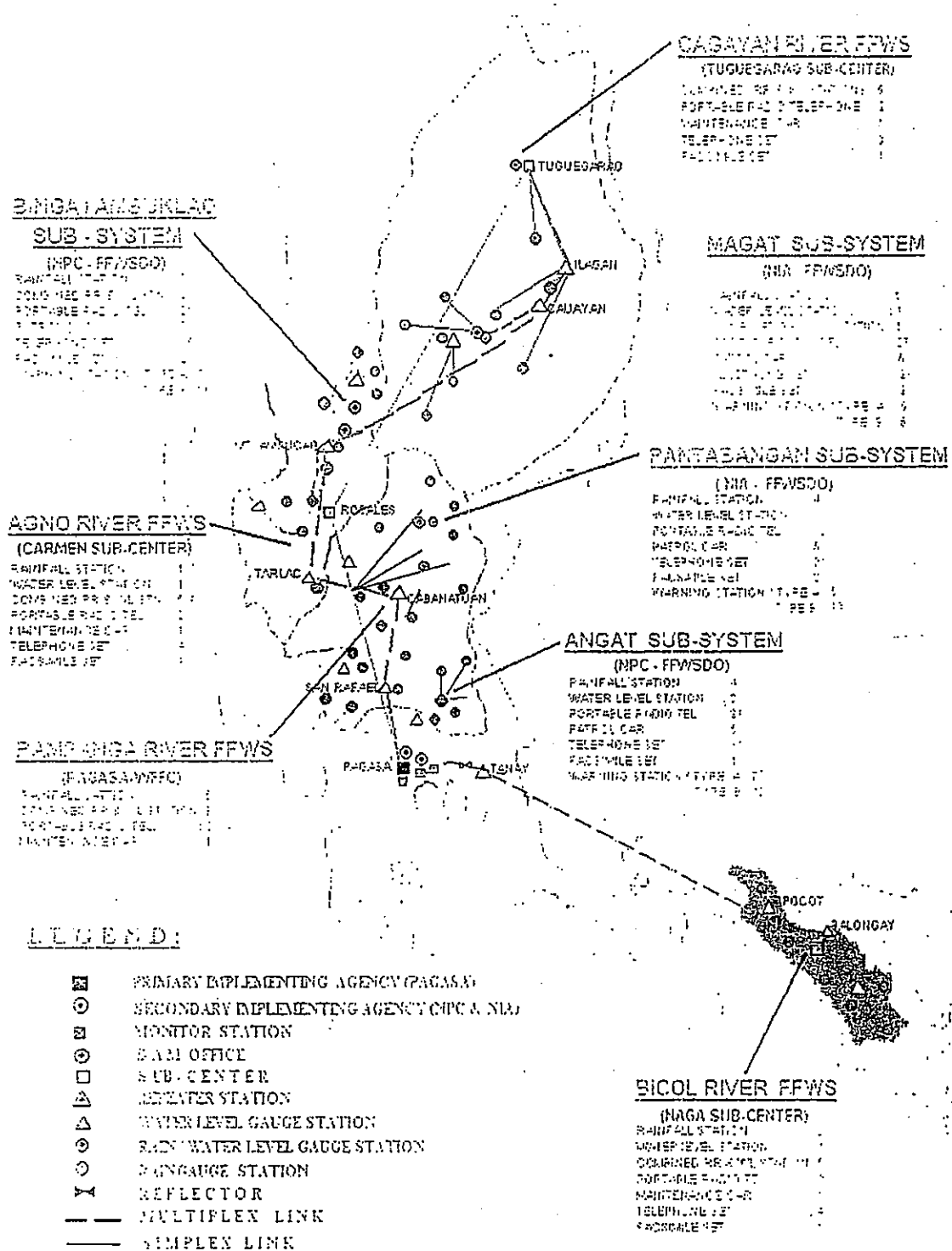


FIG. 6 OVERALL NETWORK OF EXISTING FFWSs
(Pampanga, ABC and FFWSDO)

**Minutes of Discussions
on the Preparatory Study
on the Project for Rehabilitation of Flood Forecasting and Warning System
in the Pampanga and Agno River Basins
in the Republic of the Philippines**

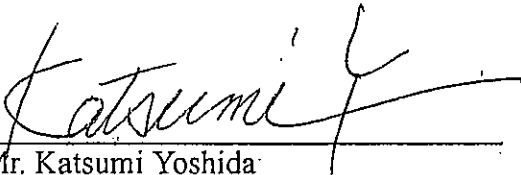
In response to a request from the Government of the Republic of the Philippines, the Government of Japan decided to conduct a Preparatory Study on the Project for Rehabilitation of Flood Forecasting and Warning System in the Pampanga and Agno River Basins (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Philippines the Preparatory Study Team (hereinafter referred to as "the Team"), headed by Mr. Katsumi Yoshida, Deputy Resident Representative of the JICA Philippines Office. The Team is scheduled to stay in the Philippines from November 5 to December 9, 2003.

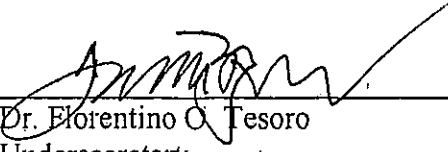
The Team held discussions with the officials concerned of the Government of the Philippines and conducted a field survey in the study area.

In the course of discussions and field survey, both sides confirmed the main items described in the attached sheets.

Quezon City, November 12, 2003



Mr. Katsumi Yoshida
Leader
Preparatory Study Team
Japan International Cooperation Agency
JAPAN



Dr. Florentino O. Tesoro
Undersecretary
Department of Science and Technology
Officer-in-Charge
Philippine Atmospheric, Geophysical and
Astronomical Services Administration
Republic of the Philippines

ATTACHMENT

1. Objective of the Project

The objective of the Project is to rehabilitate the flood forecasting and warning system in the Pampanga and Agno river basins.

2. Project Sites

Pampanga and Agno river basins.

The Project areas are shown in Annex-1.

3. Responsible and Implementing Agency

The responsible agency is the Department of Science and Technology (hereinafter referred to as "DOST") and implementing agency is the Philippine Atmospheric, Geophysical and Astronomical Services (hereinafter referred to as "PAGASA").

The organization chart of the DOST is shown in Annex-2. The organization chart of the PAGASA is shown in Annex-3.

4. Items Requested by the Government of the Philippines

After discussions with the Team, the items requested by the Philippines side are shown in Annex-4.

JICA will assess whether the request is appropriate and will report the findings to the Government of Japan.

5. Japan's Grant Aid Scheme

The Philippines side understands the Japan's Grant Aid scheme explained by the Team, as described in Annex-6.

6. Schedule of the Study

The Team will continue to study in Japan until the end of December 2003. If the Project is deemed feasible as the Japan's Grant Aid based on the results of the Preparatory Study, then JICA will send the Basic Design Study Team to the Philippines subject to the instruction by the Ministry of Foreign Affairs of Japan.

7. Other Relevant Issues

7-1 The Team explained to the Philippines side that the Project is a rehabilitation project of the previous Japan's Grant and Loan Aid projects, and the rehabilitation of these projects shall be basically conducted by the Government of the Philippines. Therefore the necessity and adequacy of the Project to be implemented under the Japan's Grant Aid shall be carefully examined, and if both necessity and adequacy will not be firmly cleared, it would be difficult to proceed to the basic design study. The Philippines side understood and confirmed the above-mentioned issue.

7-2 The Team pointed out that the payment of Value Added Tax (VAT) imposed on Japanese Nationals with respect to the payment carried out for and the income accruing from the supply of the products and services under the verified contract has not been executed in some previous projects by the Government of the Philippines. The Team explained to the Philippines side that the confirmation of the payment of VAT on the Project by the Government of the Philippines is essential for the implementation. The Philippines side understood and confirmed the above-mentioned issue.

7-3 The present conditions of telemetering and observation equipment which are specified by the Philippines side are shown in Annex-5.

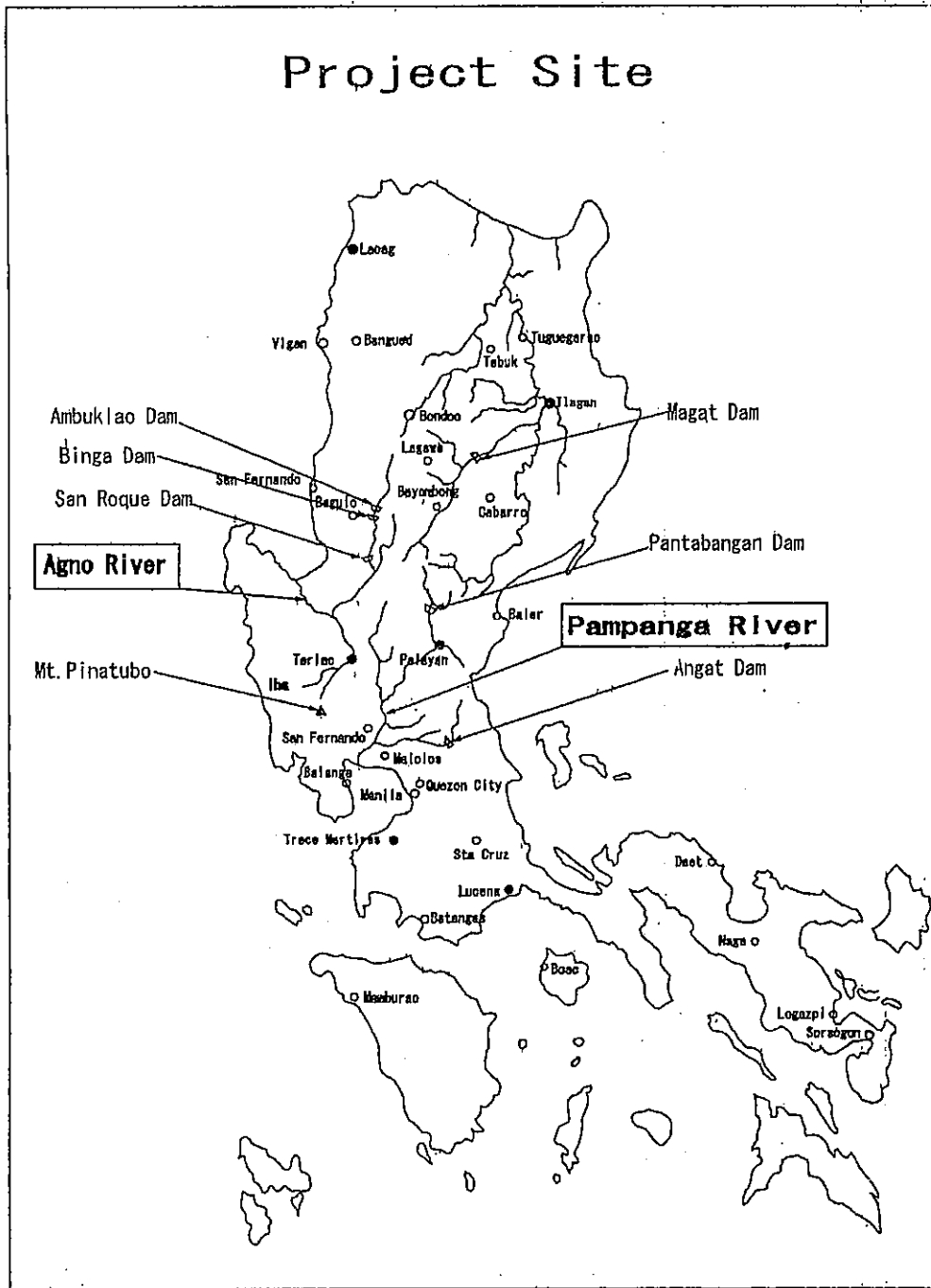
7-4 The Team requested the Philippines side to submit the documents/data which the Team requested before 8th of December. Especially the following items shall be submitted before 1st of December;

- location map of existing stations and list of existing equipment (including specifications and source of budget),
- record of flood forecasting and warning activities and damage reduction from past major floods,
- records and latest plan of operation and maintenance of the flood forecasting and warning system (including staff and budget).

7-5 The Team explained to the Philippine side that as far as the relocation of stations is concerned, the Philippines side shall secure land and undertake the other necessary measures in proper time. The Philippines side understood and confirmed the above-mentioned issue.

7-6 The Philippines side shall secure enough budget and personnel necessary for the proper and effective operation and maintenance including replacement of the equipment procured under the Grant Aid, if the Project is implemented.

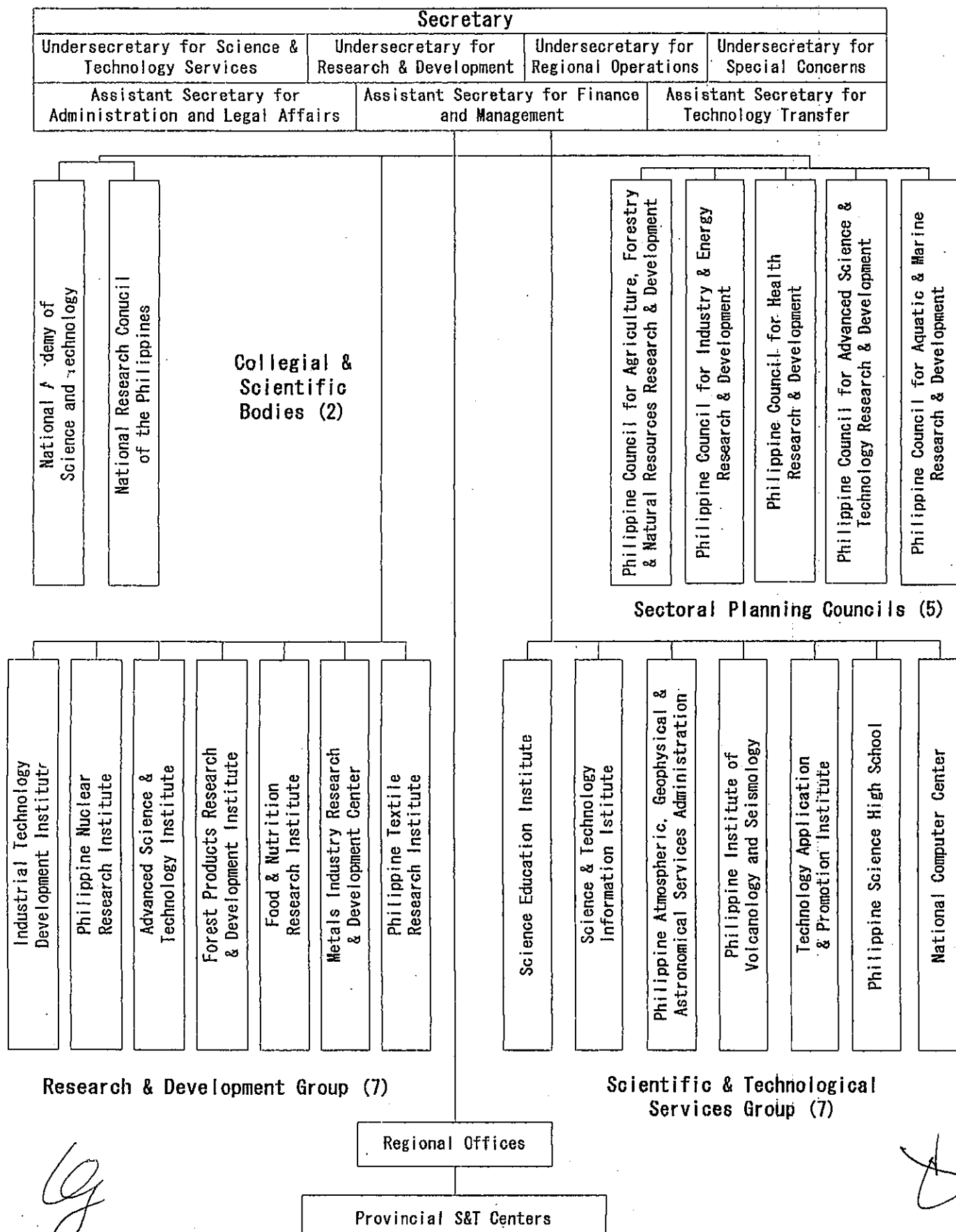


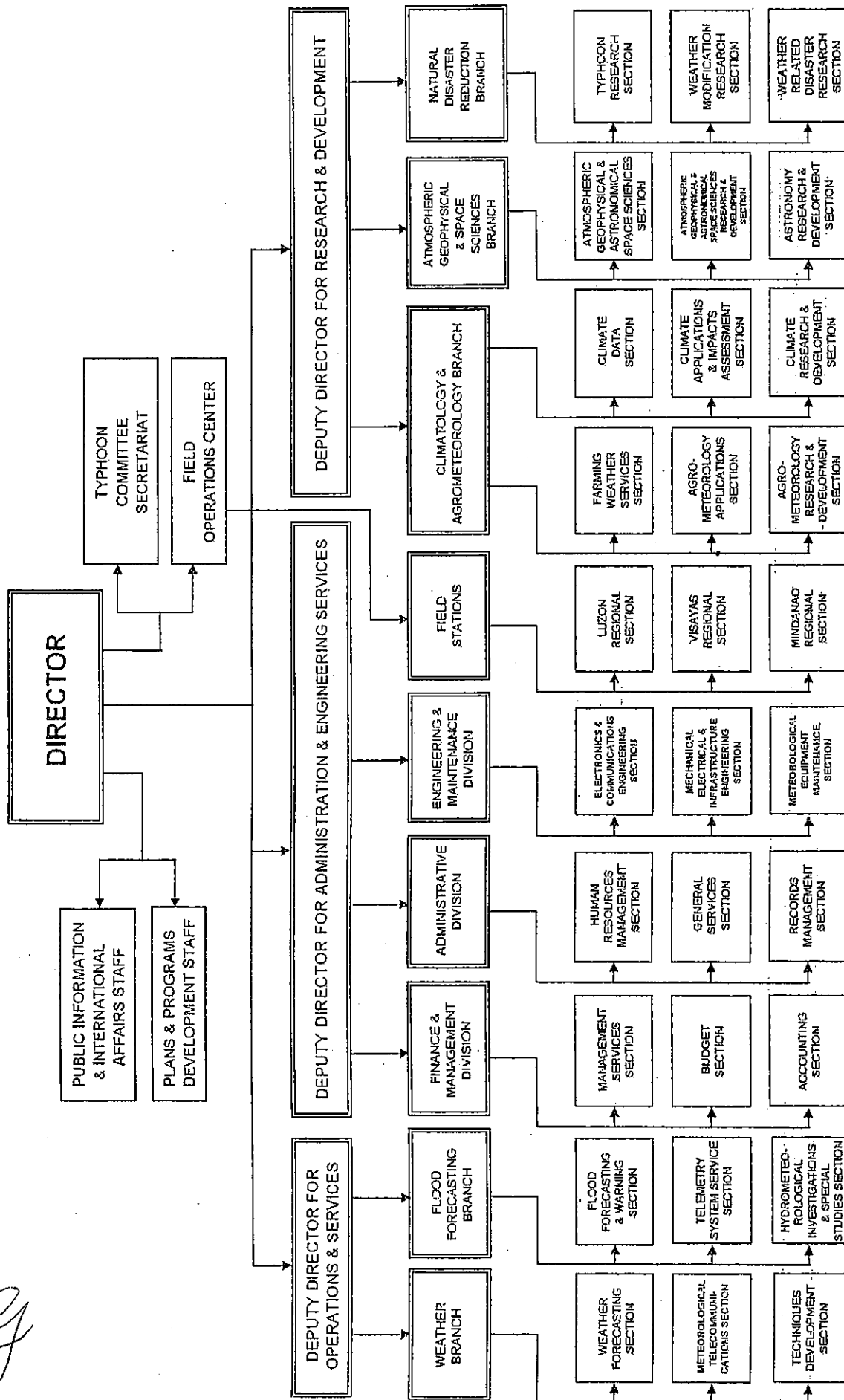


lg

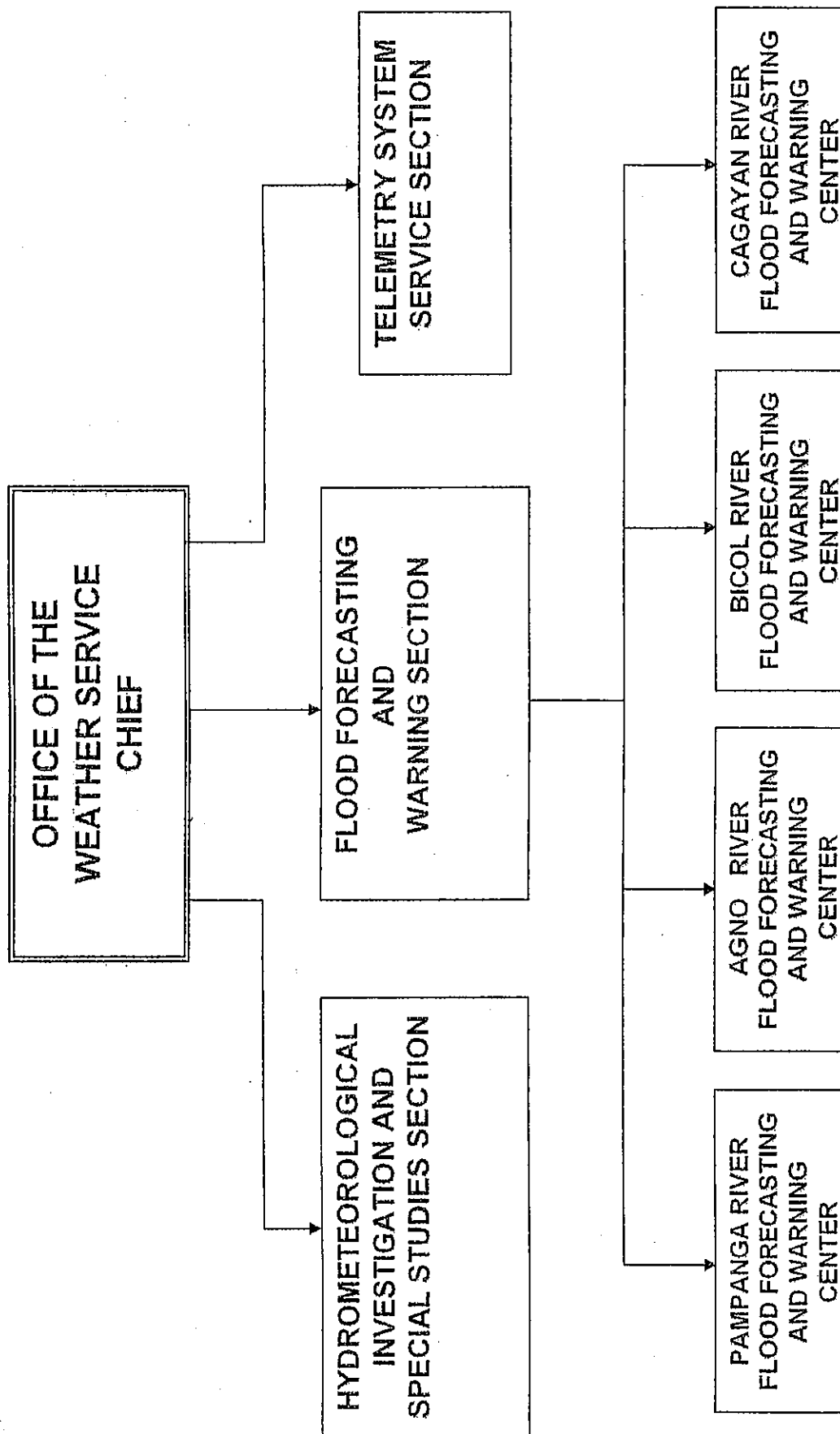
8

Organizational Chart of DOST





ORGANIZATIONAL CHART OF PAGASA



FLOOD FORECASTING BRANCH ORGANIZATIONAL STRUCTURE

Handwritten signature

Handwritten mark

The Project for Rehabilitation of
Flood Forecasting and Warning System in the Pampanga and Agno River Basins

ANNEX 4

List of Equipment

Agno River Basin

Station Name	Category	Rehabilitation					
		Water Level	Telemetry	Radio	Repeater	Power Supply	Building
Binga Dam	R, W	○	○	○		○	
Mt. Ampucao	R, T		○	○	○	○	
San Roque	R, W	△	○	○		○	
Santa Barbara	R, W	△	○	○		○	
Banaga	W	△	○	○		○	
Carmen	R, W	○	○	○		○	
Wawa	R, W	○	○	○		○	
Tibag	R, W	○	○	○		○	
Rosales	SC			○			
Total		7	8	9	1	8	

R: Rain Gauge

W: Water Level Gauge

T: Repeater

SC: Sub Center

△: Water Level Recorder

○: Sensor and Water Level Recorder

Pampanga River Basin

Station Name	Category	Rehabilitation					
		Water Level	Telemetry	Radio	Repeater	Power Supply	Building
Munoz	R		○	○		○	
Sapang Buho	R, W	○	○	○		○	
Mayayayap	R, W	○	○	○		○	
Gabaldon	R		○	○		○	
Zaragoza	R, W	○	○	○		○	○
Papaya	R		○	○		○	
San Isidro	R, W	○	○	○		○	○
Arayat	R, W	△	○	○		○	
Candaba	R, W	△	○	○		○	○
Sibul Spring	R		○	○		○	
Sasnuan	R, W	○	○	○		○	
Sulipan	R, W	△	○	○		○	
Ipo Dam	R		○	○		○	
San Rafael	R, T		○	○	○		
Cabanatuan	T			○	○		
Total		8	14	15	2	13	3

R: Rain Gauge W: Water Level gauge T: Repeater SC: Sub Center

△: Water Level Recorder ○: Sensor & Water Level Recorder

Monitoring

Station Name	Category	Rehabilitation		
		Power Supply	Monitoring (Pampanga)	Monitoring (Agno)
DIC		○	○	○
Agno		○		○
DPWII			○	○
Total		2	2	3

Computer System

Center Name	Type	No.
DIC		5
Agno		2
Pampanga		2
Total		9

Other Spare Parts

Item	No.
Current Meter	2
Maint. Vehicle	5

leg

J

Condition of Telemetering and Observation Equipment

1. Radio Frequency

- The 150 MHz (VHF) is in good condition and operational.
- The 800 MHz (UHF), which serve as the backbone of the FFWS is affected by interference coming from the Cellular Mobile Telecommunication System (CMTS). As a temporary measure, the PAGASA has conducted swapping of radios for the 800 Mhz which enabled the system to be operational. At present, the PAGASA is periodically negotiating with the cellular companies and the National Telecommunication Commission (NTC) regarding the interference problem.

2. Observation Equipment (Water level) – currently operational but need to be changed. Most of the FFWS equipment has exceeded their life span of 10 to 15 years. In the Agno river basin, most if not all of the telemetering equipment were installed in 1979 and these equipment are still working using the decommissioned spare parts from the Pampanga river basin when it was rehabilitated in 1990.

3. Radio and Telemetry Equipment - Just like the observation equipment, the radio and telemetry equipment have exceeded their life span of 10-15 years.

Listed below is the present status of water level equipment in the Pampanga and Agno river basins. The recommended change or replacement of water level sensors is based on maintenance consideration and geographic location of the stations.

Water Level Stations	Status	Recommendation/Remarks
Pampanga river basin		
Sapang Buho	Second sensing pole - defective	Change to pressure type (including digital coder and digital printer)
Mayapyap	Existing WL equipment (Sensing pole) is operational but difficult to maintain due to deterioration.	Change to pressure type (including digital coder and digital printer)
Zaragoza	Difficult to maintain due to location	Station housing - to be relocated near the bridge. Equipment to be replaced with pressure type (including digital coder and digital printer)
Arayat	Water level recorder is defective	Need to replace the water level recorder
San Isidro	Difficult to maintain due to location (Encroachment of inhabitants around the station)	Station housing - to be relocated near the bridge. Change to pressure type (including digital coder and digital printer)
Candaba	Difficult to maintain due to location and deterioration of station housing; Defective water level recorder	Station housing - to be relocated near the bridge or access road. Need to replace the old to new WL recorder.
Sulipan	The water level recorder is defective	Need to replace the water level recorder.
Sasmuan	Affected by lahar	Replace the old to new pressure type sensor.
Agno river basin		
Binga	2 nd sensing pole - defective	Change to pressure type
San Roque	WL recorder and digital coder has deteriorated	Elevate junction box and replace WL recorder and digital coder
Carmen	1 st sensing pole - defective	Change WL equipment to pressure type including sensor and recorder
Wawa	Affected by lahar	Change WL sensor to pressure type
Tibag	Affected by lahar	Change WL sensor to pressure type
Banaga	The station housing and WL sensor are new; Defective water level recorder and digital coder.	Need to replace WL recorder and digital coder
Sta. Barbara	WL recorder is defective	Need to replace WL recorder

洪水予警報にかかる関係機関、住民とのインタビュー結果まとめ

対象者	情報入手先	被害実態	避難対応等
バナ-ガ観測所近くの バランガイ長	ラジオからの情報	殆ど1年おきの避難	Highwayへの避難指示、家畜・住民、メガホン等も使用、ボートも一部所有
パンガシナン州計画 開発局長	PAGASAからファックスを受ける	ほぼ1年おきに深刻な被害	警報はMayor Officeへ、Mayor Officeからバランガイへ
Calasio 町果物店の 女主人	テレビからの情報		果物を別の場所へ移動
Calasio 町女子高生	ラジオからの情報		学校へ避難
San Isidro 簡易食堂 女性陣(11人)	テレビ、ラジオからの情報	毎年膝くらいまで浸水する	避難はしない。飲料水、食料の準備はする。
Candaba Municipality の計 画・開発局長	テレビ、ラジオからの情報	毎年2,3回浸水する。	家財を2階にあげる。家畜を高台に避難させる。救急品を用意する。
Sasmuan 観測所隣の 店	テレビ、ラジオからの情報	だいたい毎年浸水する。2年前の1.2mが一番ひどかった。	昨年は品物は全部2階にあげたが避難はしなかった。
Municipality of Sasmuan	テレビ、ラジオからの情報	1997年は2.1m浸水した。浸水も最大1ヶ月くらい続くときもある。	財産は2階とか屋根上とかに移動させる。Governmentからの救急品を待つときもある。
Sulipan 観測所対岸 万屋おばさん達(2人)	テレビ、ラジオからの情報	平均年一回浸水する。場所によっては屋根までつかる。	警報を受けると、品物類をHighway上とか道路上に移動する。軍隊からのヘリコプターからの救急品を待つこともある。

集中会議意見まとめ

1. 会議概要

No.	年 月 日	場 所	参 加 人 数
1	2000年4月12日	パンガシナン州	77人
2	2000年5月3日	カバナツアン市	63人
3	2000年6月1日	サンフェルナンド市	61人

2. 会議意見集

	ダム放流警報に関して	洪水警報に関して	洪水警報伝達手段に関して
1	(1) 日時と流量を。 (2) 影響地区に達するまでの時間も。 (3) 放流量ボリュームも。	(1) 土地の言葉で。 (2) 予想水位も。 (3) 技術用語抜きで。 (4) 素人にわかるように。	(1) マスメディアの利用も。 (2) 無線機・電話・ファックス・メガフォン・携帯電話の利用も。 (3) 教会のベル・学校のベル竹筒、サイレンの利用も。
2	(1) 影響を受ける地域の明示を (2) 氾濫時刻も知らされたい。 (3) ダム放流の時刻、水量の明示も。 (4) 避難時間の確保のために少なくとも5時間前の警報を。	(1) タガログ語で知らされたい。 (2) 用語の解説も入れてほしい。 (3) 正しい理解のために、教育訓練を。 (4) 氾濫予想地区を地図で知らされたい。	(1) 全ての情報伝達手段を考慮に。 (2) 情報伝達システムの改善を。 (3) サイレン・拡声器等の手段の利用も。 (4) 国家警察・防災事務局・州防災調整局・地方マスメディア、ラジオ等との連携も。
3	(1) 放流は日中にされたい。 (2) 放流影響地区に対し、説明会を持つべきである。	(1) 地方語で書かれたい。 (2) 技術用語は脚注を入れる・簡易化する等を考えられたい。 (3) 氾濫が予想される全てのパラングアイを一覧表で与えられたい。 (4) 氾濫予想地域を地図で示されたい。	(1) ファックス・電話の利用も。 (2) インターネットへの掲示も。 (3) 拡声器・携帯電話・無線機・教会のベル・角笛・ラジオ・テレビ・新聞の利用も。 (4) NGO も利用されたい。 (5) 州からの情報はパラングアイレベルまで。



CNC-9909-03PA-020

CERTIFICATE OF NON-COVERAGE

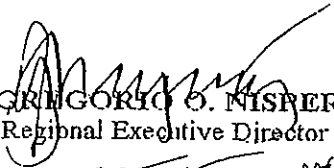

This **CERTIFICATE OF NON-COVERAGE** is hereby granted to *PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION (PAGASA)/DOST* for the **Rehabilitation of the Existing Flood Forecasting and Warning System in the Pampanga River Basin**, from the requirements of P.D. 1586 and its implementing Rules and Regulations pursuant to Article II, Section 2.0 of DENR Administrative Order No. 96-37, Series of 1996 and that therefore the proponent can proceed with the implementation of the project subject however to the following conditions:

1. This certificate shall cover the improvement of the existing flood forecasting and warning system in the Pampanga River Basin located at Maharlika Highway, Munoz, Nueva Ecija; Sapang Buho, Palayan City, Nueva Ecija; Maharlika Highway, Bgy. Mayapyap, Cabanatuan City; Bgy. Malinao, Gabaldon, Nueva Ecija; Sto. Rosario, Zaragoza, Nueva Ecija; Bgy. Gen. Tinio, Nueva Ecija; Maharlika Highway, Sibul Spring, Pampanga; Brgy. San Isidro-Jaen Bridge, San Isidro, Pampanga, San Fernando-Arayat-Cabiao Highway, Bgy. San Agustin, Arayat, Pampanga; Bgy. Paralaya, Candaba, Pampanga; Bgy. Sabang, San Rafael, Bulacan; Bgy. Ipo, Norzagaray, Bulacan; Bgy. Sta. Lucia, Sasmuan, Pampanga and McArthur Highway, Bgy. Sulipan, Apalit, Pampanga, with the following activities:
 - a) Replacement/rehabilitation of telemetry equipment, radio equipment, repeater equipment (Cabanatuan, San Rafael), power supply system, water level gauging equipment (pressure type) and repair of station building;
 - b) Restoration of computer system (Pampanga River Flood Forecasting and Warning Center)
 - c) Provision of Telefax, Communication Facilities (RDCC, PDCC, MDCC)
Fax Machines.(RDCC, provinces, municipalities)
 - d) Spare parts and others
Spare parts
Patrol car (Pampanga River Basin FFWS Center)
2. All other necessary government permits should be secured before project implementation;
3. All structures and foundations shall be designed and constructed strictly in conformity with applicable Engineering Practices and Standards and the National Structural Code of the Philippines to insure occupational safety. Provisions to address fire hazards shall also be effected;

CNC-9909-03PA-020

4. No activities other than those stated in the submitted documents shall be undertaken so as not to cause adverse environmental impact to immediate vicinities;
5. Any misleading/false information contained in the submitted documents shall be sufficient cause for the revocation/cancellation of this certificate; and
6. Transfer of ownership of this project carries the same conditions in this Certificate for which written notification shall be made by herein grantee to DENR-Region III within fifteen (15) days from such transfer.

Given this SEP 20 1999


GREGORIO O. NISPEROS
Regional Executive Director


Legal and Research Fee: P70.00
Filing Fee: P310.00
O.R. No. 1791234
Date: Oct. 20, 1999



Republic of the Philippines
DEPARTMENT OF ENVIRONMENT & NATURAL RESOURCES
Region III, Amalgamated Bldg., MacArthur Highway
Baliti, San Fernando, Pampanga


CNC-9909-03TA-003

CERTIFICATE OF NON-COVERAGE

This **CERTIFICATE OF NON-COVERAGE** is hereby granted to **PHILIPPINE ATMOSPHERIC, GEOPHYSICAL AND ASTRONOMICAL SERVICES ADMINISTRATION (PAGASA)/DOST** for the **Rehabilitation of the Existing Flood Forecasting and Warning System in the Agno River Basin**, from the requirements of P.D. 1586 and its implementing Rules and Regulations pursuant to Article II, Section 2.0 of DENR Administrative Order No. 96-37, Series of 1996 and that therefore the proponent can proceed with the implementation of the project subject however to the following conditions:

1. This certificate shall cover the improvement of the existing flood forecasting and warning system in the Agno River Basin located at Brgy. Tibag, Tarlac, Tarlac with the following activities:
 - a) Replacement/rehabilitation of telemetry equipment, radio equipment, repeater equipment, power supply system, water level gauging equipment (pressure type) and repair of station building;
 - b) Restoration of computer system (Agno River Flood Forecasting and Warning Center)
 - c) Provision of Telefax, Communication Facilities (RDCC, PDCC, MDCC)
Fax Machines (RDCC, provinces, municipalities)
 - d) Spare parts and others
Spare parts
Patrol car (Agno FFWS Center)
2. All other necessary government permits should be secured before project implementation;
3. All structures and foundations shall be designed and constructed strictly in conformity with applicable Engineering Practices and Standards and the National Structural Code of the Philippines to insure occupational safety. Provisions to address fire hazards shall also be effected;
4. No activities other than those stated in the submitted documents shall be undertaken so as not to cause adverse environmental impact to immediate vicinities;
5. Any misleading/false information contained in the submitted documents shall be sufficient cause for the revocation/cancellation of this certificate; and
6. Transfer of ownership of this project carries the same conditions in this Certificate for which written notification shall be made by herein grantee to DENR-Region III within fifteen (15) days from such transfer.

Given this SEP 28 1999

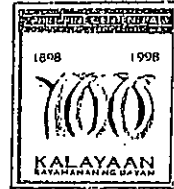

GREGORIO O. NISPEROS
Regional Executive Director

Legal and Research Fee: P70.00
Filing Fee: P310.00

Paid under O. R. No. 1791235 dated Oct. 20, 1999



Republic of the Philippines
 Department of Environment and Natural Resources
 Regional Office No. I
 San Fernando, La Union
 41-38-33; 41-29-75; 41-47-88



01 99 10 -07 0022- 060

CERTIFICATE OF NON-COVERAGE

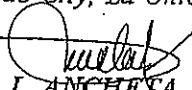
Pursuant to Presidential Decree No. 1586 and in accordance to Article II, Section 2 of Department Administrative Order No. 96-37 and Chapter II Paragraph I (A-F) of the Procedural Manual for Department Administrative Order No. 96-37, the Department of Environment and Natural Resources, Region I, hereby grants this Certificate of Non-Coverage (CNC) to PHILIPPINE ATMOSPHERIC GEOPHYSICAL AND ASTRONOMICAL SERVICE ADMINISTRATION (PAG-ASA) for the proposed Infrastructure/Service (Flood Forecasting and Warning System) Project located at San Roque, San Manuel; Brgy. Puelay, Villasis; Brgy. Wawa, Bayanbang; Brgy. Salaza, Bugallon; Brgy., Maningding, Sta. Barbara and Tumana, Carmen, Rosales all in the Provinces of Pangasinan subject to the following conditions:

1. That the proponent shall secure prior to project implementation all necessary permits/clearances from concerned government agencies who have administrative jurisdiction over such projects/operations, i.e., HLURB, LGU, DOH, NTC, DPWH, etc.;
2. That this Certificate shall cover the rehabilitation and operation of one (1) unit existing flood forecasting telecommunication station building (2.5 m x 2.5 m) including one (1) unit each of Flood Forecasting and Warning System (FFWS) facilities to include telemetry equipment, radio equipment, repeater equipment, power supply system, water level gauging equipment (premium type) to be located in all the six municipalities of Pangasinan;
3. No expansion or additional improvement of the facilities shall be undertaken without prior clearance from this Office; and
4. All damages or adverse impact cause to the environment resulting from the implementation of the project due to non-adoption of appropriate or adequate mitigating measures shall be the sole responsibility or liability of the proponent.

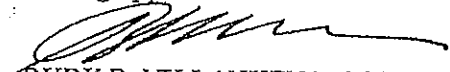
Continuance of operation subject to this Certificate shall be deemed acceptance of above conditions herein specified.

Non-compliance with any of the above stipulations will be sufficient cause for the suspension or cancellation of this Certificate and/or a fine in the amount not to exceed Fifty Thousand Pesos (P50,000.00) for every violation thereof, at the discretion of the Department (Section 9 of PD 1586).

Given under the seal of this Department at San Fernando City, La Union this 7th day of September, Nineteen Hundred and Ninety Nine.


VICTOR J. ANCHETA, CESO IV
 OIC, Regional Executive Director

Recommending Approval:


RUDY R. VILLANUEVA, CESO IV
 Regional Technical Director
 for Environment

Processing Fee/Filing Fee : P 310.00 O.R.No. 9887395 Date: 10-22-99
 PD 1856/Legal Research Fee : 70.00 O.R.No. 9887395 Date: 10-22-99

VALID ONLY IF MARKED WITH DRY SEAL

cnc99/pag-asa/infrastructure

Grow a Tree for Legacy

調査団員

名前	担当	所属
吉田勝美	団長	(独法)国際協力機構 フィリピン事務所次長
津守佑亮	計画管理	(独法)国際協力機構 無償資金協力部 業務第三課
今井敏勝	システム改善	日本建設コンサルタント(株) 海外事業部
大谷和彦	維持管理	八千代エンジニアリング(株) 国際事業部 環境・水資源部.

現地調査日程

			JICA Member		Consultant
			Mr. Yoshida	Mr. Tsumori	Mr. Imai and Mr. Otani
1	11.5	Wed		Narita (9:40) – Manila (13:30) by JAL 741	
				- Courtesy Call on Resident Representative JICA - Internal Meeting at JICA	
2	11.6	Thu	- Courtesy Call to Embassy of Japan - Courtesy Call to NEDA - Courtesy Call to DOST - Courtesy Call to PAGASA (Meeting with PAGASA Officials & Staff)		
3	11.7	Fri	- Trip from Manila to Agno River Sub-Center - Site Survey at Rosales, San Roque, Carmen, Santa Barbara, Wawa and Tibag Stations - Trip to Tarlac		
4	11.8	Sat	- Site Survey at Zaragoza, Sapang Buho, Mayapyap, San Ishidoro and Arayat Stations - Trip to Manila		
5	11.9	Sun	Internal Meeting		
6	11.10	Mon	Discussion with PAGASA		
7	11.11	Tue	Discussion with PAGASA		
8	11.12	Wed	- Signing on M/D with DOST and PAGASA - Report to Embassy of Japan - Report to JICA		
9	11.13	Thu		Manila (9:50) – Narita (14:50) by JAL 746	Questionnaire Survey to PAGASA
10	11.14	Fri			Data Collection in PAGASA:
11	11.15	Sat			Data Collection in PAGASA
12	11.16	Sun			Preparation of Site Survey
13	11.17	Mon			- Trip to Agno River Basin - Site Survey: Rosales, Binga, Mt. Ampucao
14	11.18	Tue			- Site Survey: Banaga - Trip to Pampanga - Site survey: Munoz
15	11.19	Wed			Site Survey: Cabanatuan, Papaya, Sibul Spring, San Rafael, Ipo
16	11.20	Thu			Site Survey: Sasmuan, Sulipan, Candaba
17	11.21	Fri			Data Collection in PAGASA
18	11.22	Sat			Data Collection in PAGASA
19	11.23	Sun			Data Analysis
20	11.24	Mon			Data Collection and Analysis in PAGASA
21	11.25	Tue			Data Collection and Analysis in PAGASA
22	11.26	Wed			Data Collection and Analysis in PAGASA
23	11.27	Thu			Data Collection and Analysis in PAGASA
24	11.28	Fri			Report to Embassy of Japan
25	11.29	Sat			Data Analysis
26	11.30	Sun			Data Analysis
27	12.1	Mon			Data Collection and Analysis in PAGASA
28	12.2	Tue			Data Collection and Analysis in PAGASA
29	12.3	Wed			Report Preparation
30	12.4	Thu			Report Preparation
31	12.5	Fri			Report Preparation
32	12.6	Sat			- Report Preparation - Site Survey in DPWH and DIC
33	12.7	Sun			Report Preparation
34	12.8	Mon			- Report to PAGASA and FEB - Report to JICA
35	12.9	Tue			Manila (14:40)-Narita (19:35) by JAL742

主要面談者

名前	役職
1. NEDA: National Economic and Development Authority	
Mr. Robert L. Domingo	Senior Economic Development Specialist
Mr. Narciso A. Prudente	Chief Economic Development Specialist
Ms. Ameta B. Benjamin	Senior Economic Development Specialist
Ms. Joanne P. Tolentino	Senior Economic Development Specialist
2. DOST: Department of Science and Technology	
Ms. Carol M. Yorobe	Assistant Secretary
Mr. Bernie S. Justimbaste	Director, Planning and Evaluation Service
Dr. Florentino O. Tesoro	Undersecretary
Mr. Rogelio A. Panlasigui	Undersecretary
Ms. CARMELITA A. LLAMES	Director, Budget Service
Mr. CORAZON M. MUNDOC	Planning Development Officer II
3. PAGASA: Philippine Atmospheric, Geophysical and Astronomical Services Administration	
Dr. Florentino O. Tesoro	Officer In Charge
Ms. Gloria G. Goli	Liaison Officer
Ms. Rosalie S. Pagulayan	Recording Secretary
4. FFB: Flood Forecasting Branch	
Dr. Rolu P. Encarnacion	Chief
Dr. Alan L. Pineda	Assistant Chief
Mr. Mauro J. Bautista	Section Chief
Mr. Mario I. Dungca	Section Chief
Mr. Armando P. Taruc	Chief
Mr. Heraclio M. Borja, Jr.	Planning Officer
Ms. Susan R. Espinueva	Unit Chief & C/P of JICA Expert
Mr. MARTIN F. RELLIN	Chief of Staff, Office of the Director
5. 在フィリピン共和国日本国大使館	
間瀬 利明	二等書記官
6. JICA フィリピン事務所	
中垣 長睦	所長
吉田 勝美	次長
高田 裕彦	次長
小林 清人	職員