

Table 2.1 PRESENT RIVER STRUCTURE

Name of		Purpose	Gate Type	Width (m)	Height (m)	No. of Gate	Normal W.L. (m)	El. of Sil (m)	Constructed Year
River	Weir								
Cilemahabang	Cilemahabang	Irrigation	Roller Gate	2.50	2.70	7	-	-	1979
Cikarang	Cikarang	Irrigation Municipal	Roller Gate with Flap Gate	15.00	6.00	2	22.56 W.P.	16.60 W.P.	1965
Bekasi	Bekasi	Irrigation Municipal	Double Leaf Gate with Roller Gate	12.50	8.00	3	18.60 W.P.	10.60 W.P.	1958
Ciliwung	Manggarai	Flushing Drainage	Roller Gate	5.50	6.00	2	10.00 K.P.	1.40 K.P.	-
	Karet	Flushing Municipal	Roller Gate	5.50	-	4	6.50 K.P.	2.30 K.P.	-
Cengkareng Floodway	Cengkareng	Irrigation Flushing Salinity Barrier	Roller Gate with Flap Gate	6.10	4.25	4	H.W.L. 3.55 P.P.	-2.00 P.P.	1983
Grogol	Pondok Pinang	Flushing	Sluice Gate	-	-	5	-	-	-
Pesanggrahan	Koneng	Irrigation Flushing	Radial Gate	3.65	2.33	3	Max. W.L. 5.40 P.P.	3.07 P.P.	-
Angke	Polar	Irrigation	Small Dam	-	-	Non.	-	-	-
Cisadane	Pasar Baru	Irrigation Municipal	Double Leaf Gate	10.00	-	10	12.45 P.P.	5.00 P.P.	1932
Cidurian	Rancasumur	Irrigation	Small Dam	-	-	Non.	-	-	-

Note. P.P. : Perlok Peil (P.P. ± 0), (by NEDECO Master Plan Project)W.P. : Walahar Peil (P.P. $+0.51$ m), (by West Tarum Canal Enlargement Project)K.P. : Kadaster Peil (P.P. -2.00 m), (by Keadaan Banguna-Bangunan Air Daerah Jakarta Raya)

Table 2.2 Stage of Emergency and Responsibility

Stage of Emergency	Operating / Control Facility									
	Flood Station Depok	Manggara Weir	Karet Weir	Pulo Gadung Weir	Sunter Weir	Pesanggrahan Pell Scale	Sunter Hulu Pell Scale	Cakung Drainage Weir	Cengkareng Drainage Weir	Kurulampa Weir
Stage I Authority of governor of DKI Jakarta	> 350 Cm	> 180 M ³ / Sec	> 600 PP	> 770 PP	> 400 PP	> 350 Cm	> 250 Cm	> 390 PP	> 310 Cm	> 310 Cm
Stage II Authority of Operational Commandant (Chief of DPU and Project Manager of CORBDP / WRMFCEP)	270 - 350 Cm	150 - 180 M ³ / Sec	550 - 600 PP	700 - 770 PP	370 - 400 PP	250 - 350 Cm	200 - 250 Cm	360 - 390 PP	270 - 310 PP	240 - 310 Cm
Stage III Authority of General Commandant (Chief of Maintenance Subdivision of DPU DKI, Project Manager of WRMFCEP - Ciliwung - Cisadane)	200 - 270 Cm	100 - 150 M ³ / Sec	450 - 550 PP	550 - 700 PP	340 - 370 PP	150 - 250 Cm	140 - 200 Cm	270 - 360 PP	190 - 270 PP	170 - 240 Cm
Stage IV (Authority of Gate Operator, Pump Station Operator, Who has Command, by Maintenance Officer / Staff)	≤ 200 Cm	≤ 100 M ³ / Sec	≤ 450 PP	≤ 550 PP	≤ 340 PP	≤ 150 Cm	≤ 140 Cm	≤ 270 PP	≤ 190 PP	170 Cm

Note : - Joint Operation command, function on Stage II

- If it is necessary, Stage of Emergency can be decided by General Commandant

- PP = Pell Priok / Standart datum of Priok

- CORBDP = Ciliwung - Cisadane River Basin Development Project

= Proyek Induk Pengembangan Wilayah Sungai Ciliwung - Cisadane (PIPWS Ciliwung - Cisadane)

- WRMFCEP = Water Resources Management and Flood Control Project

= Proyek Pengelolaan Sumber Air dan Pengendalian Banjir (PSAPB)

Table 3.1 COST OF FACILITIES OF RIVER WATER MONITORING SYSTEM

No.	Item	Amount (¥)
I	Data Process	
1	Overall Center	252,730,000
2	District Center	137,940,000
3	Operation Facilities	132,000,000
4	Maintenance Cost	3,052,000
5	ITV System	346,000,000
	Sub-total of I	871,722,000
II	Telemeter Facilities	
1	Monitoring Facilities	74,070,000
2	Rainfall Stations	70,618,000
3	Water-level Stations	126,240,000
4	Gauges	14,130,000
5	Spareparts	20,884,000
	Sub-total of II	305,942,000
III	Cost of Construction Material	35,330,000
IV	Cos of Engineering Services	10,655,000
V	Construction Cost	235,533,000
	Grand Total of I - V	1,459,182,000

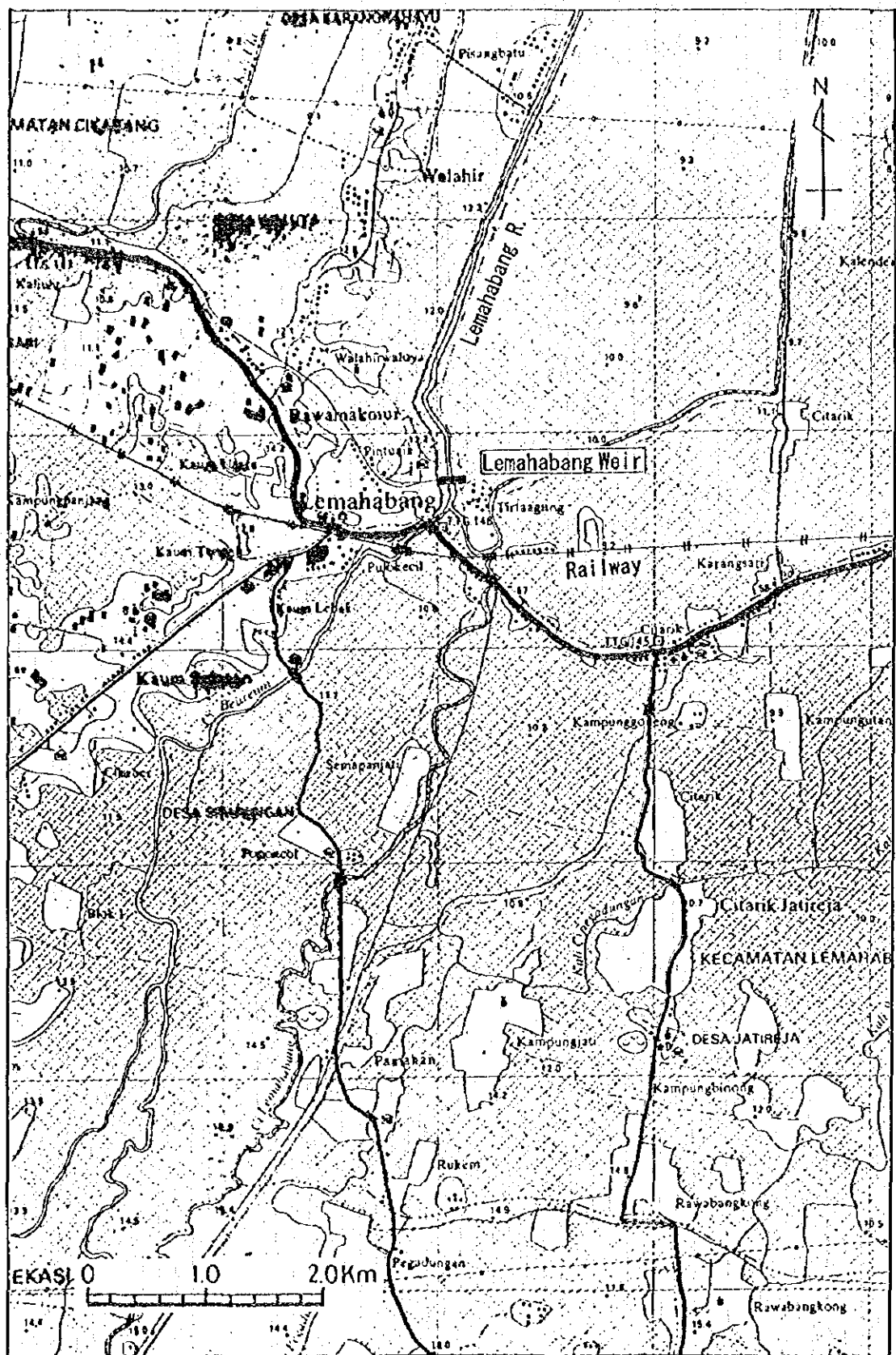


Figure 2.2 LOCATION MAP OF LEMAHABANG WEIR (1/10)

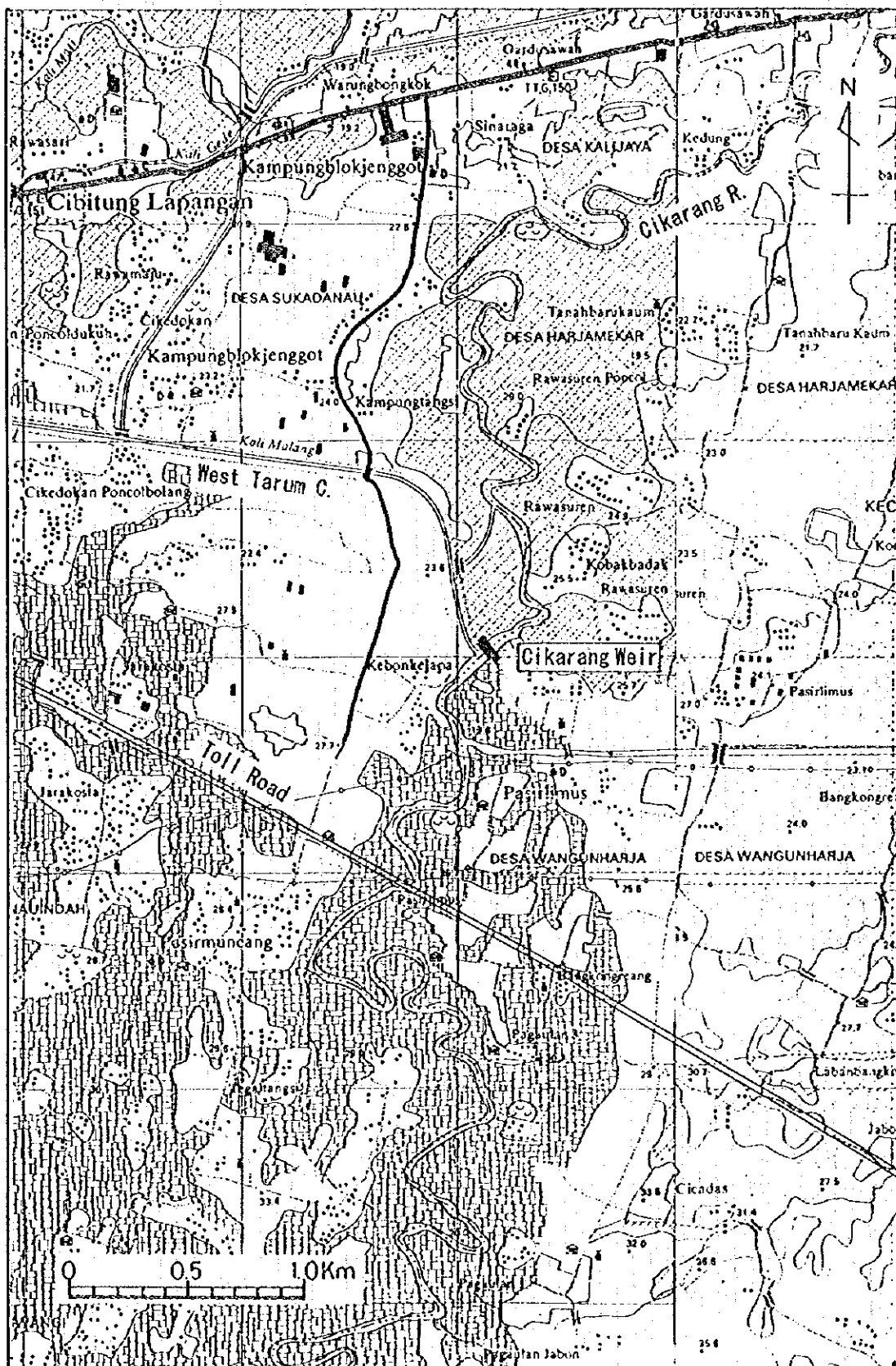


Figure 2.2 LOCATION MAP OF CIKARANG WEIR (2/10)

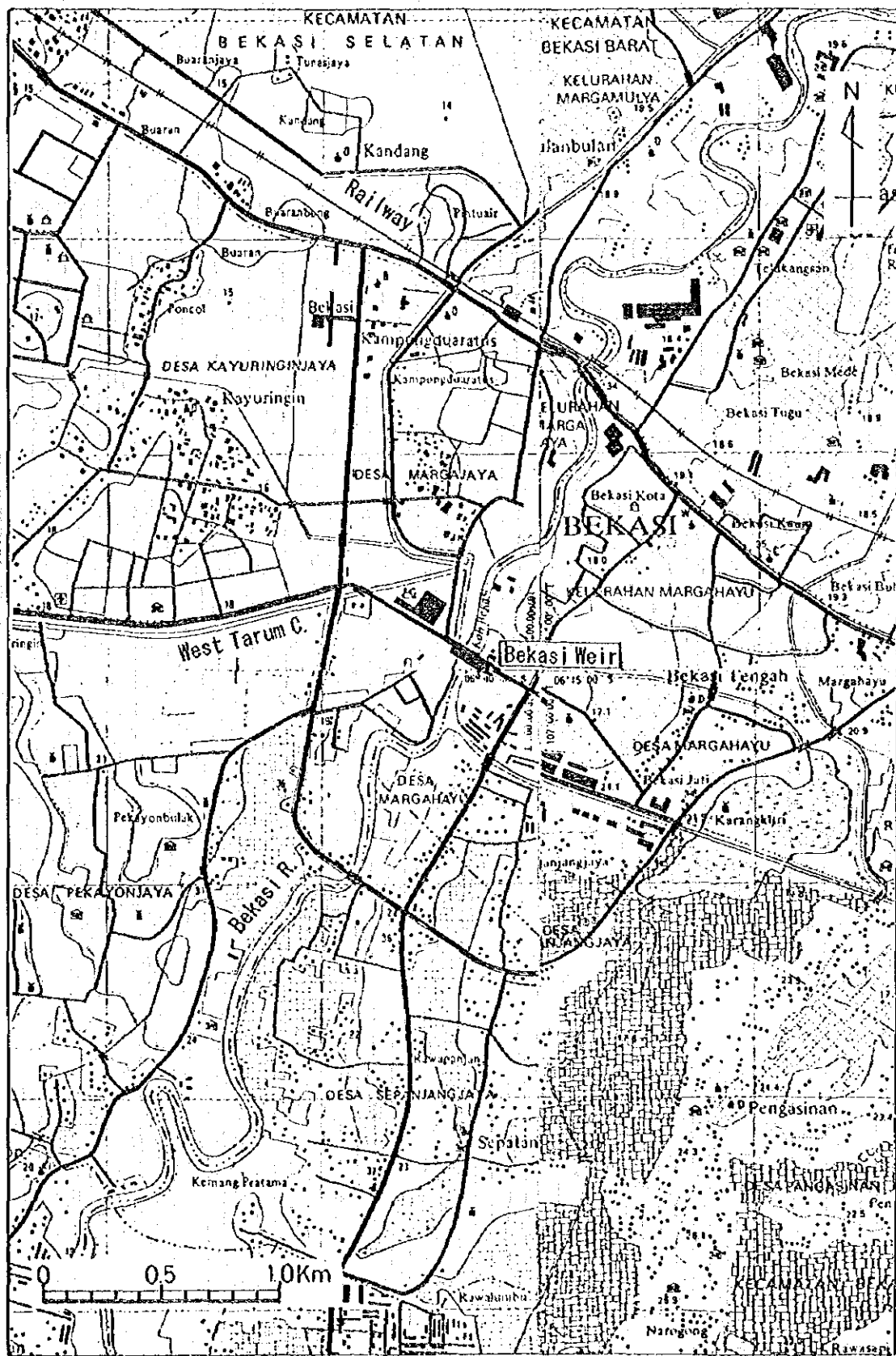


Figure 2.2 LOCATION MAP OF BEKASI WEIR (3/10)

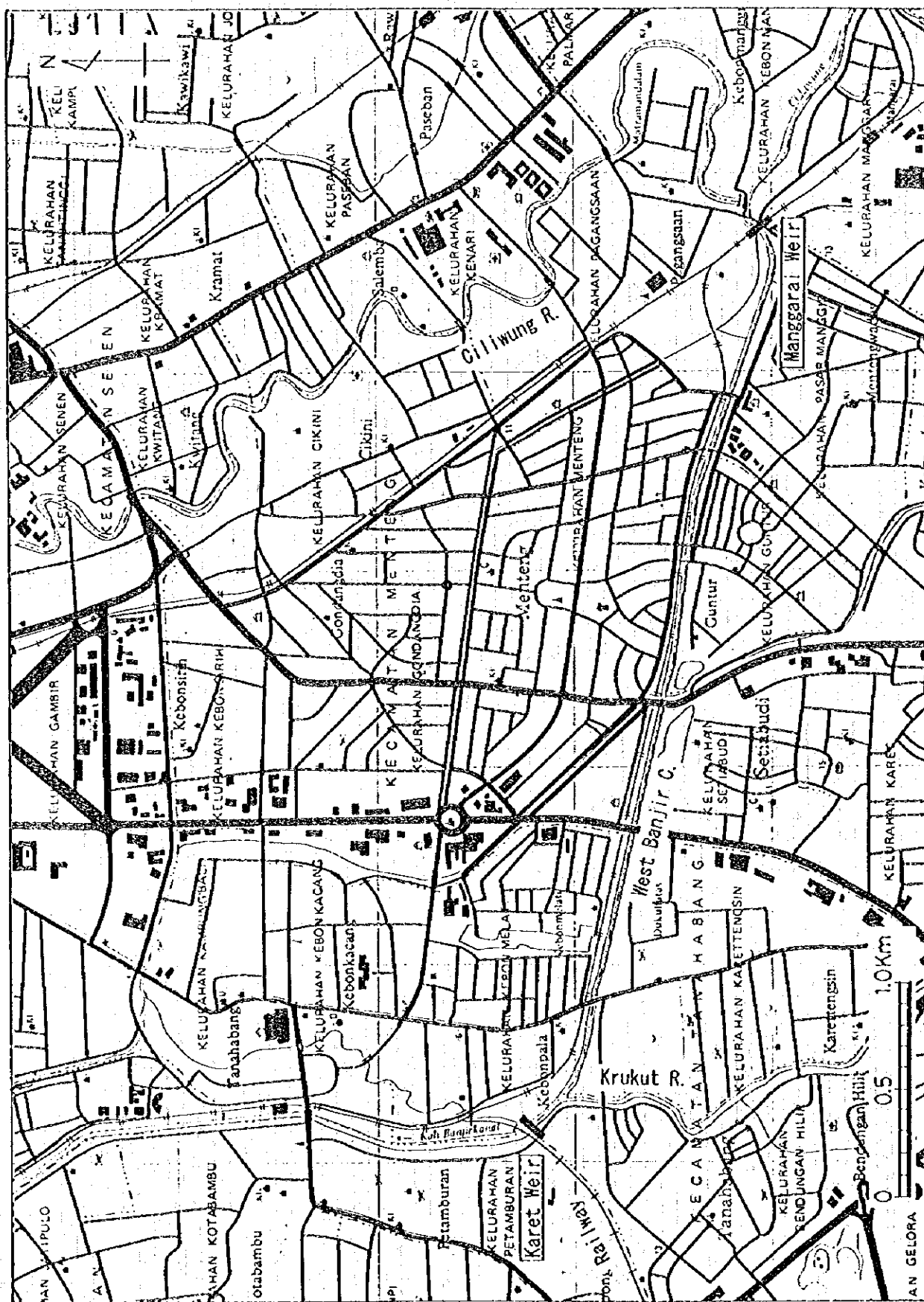


Figure 2.2 LOCATION MAP OF KARET AND MANGGARAI WEIR (4/10)

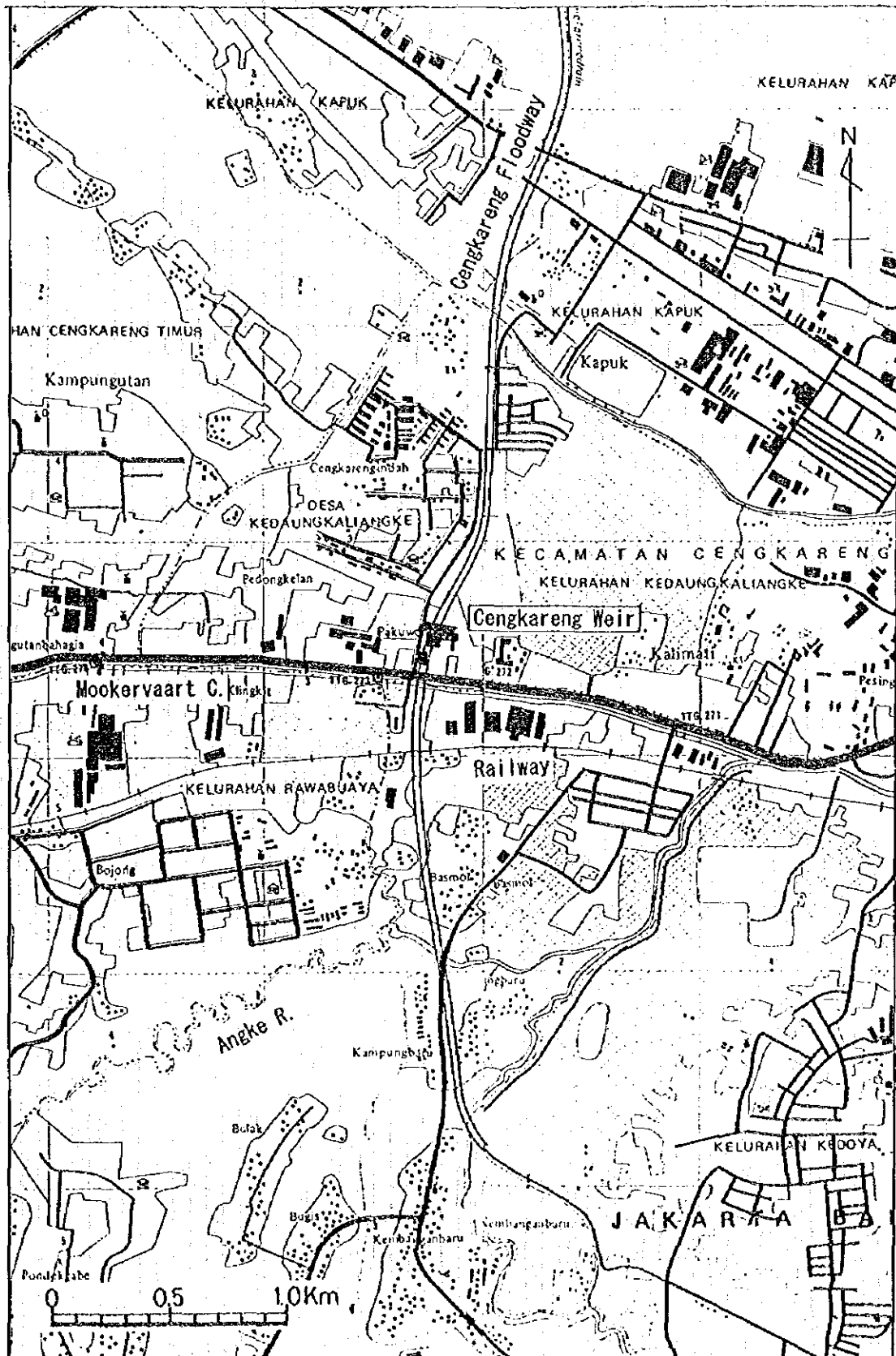


Figure 2.2 LOCATION MAP OF CENGKARENG WEIR (5/10)

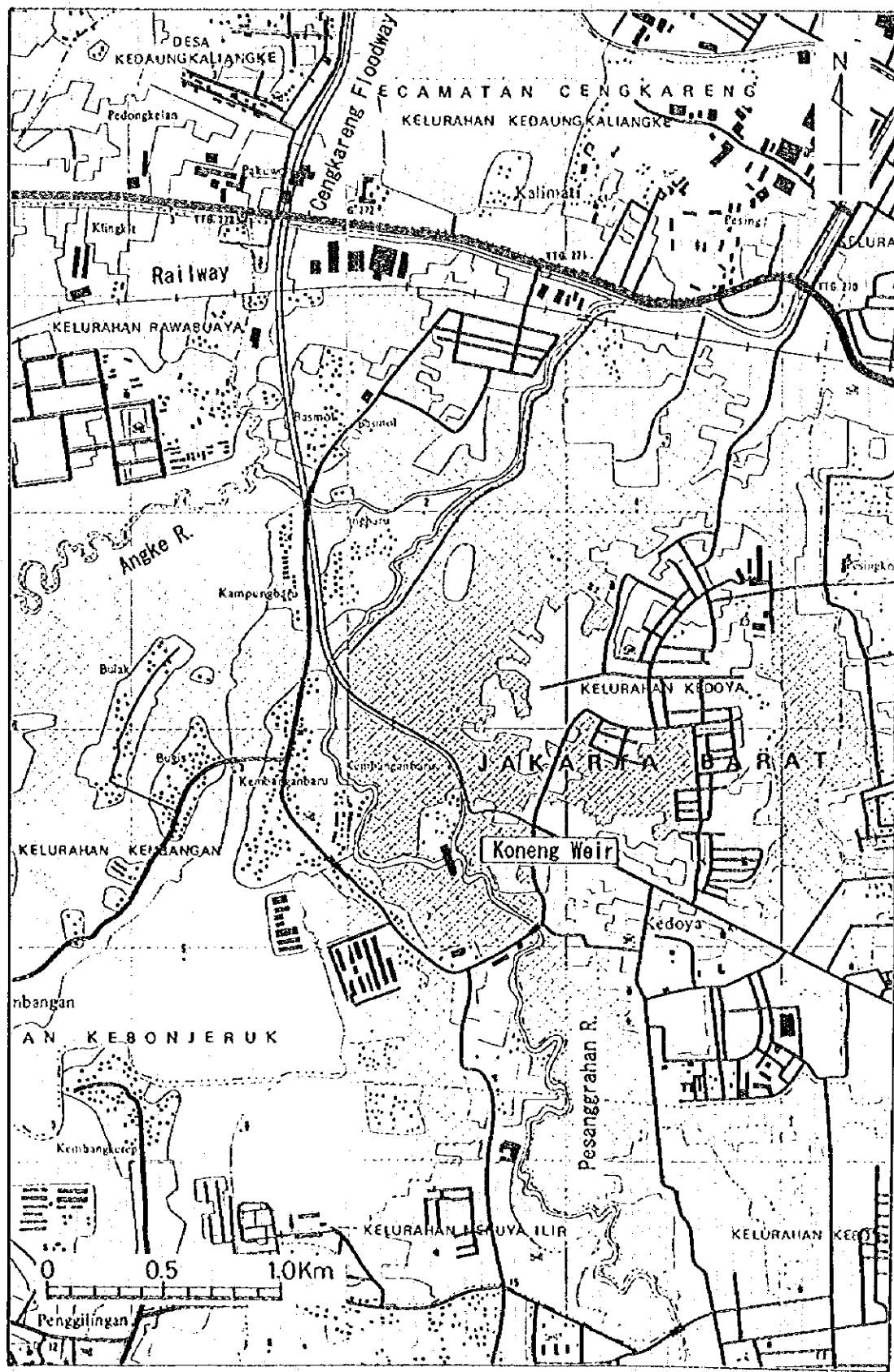


Figure 2.2 LOCATION MAP OF KONENG WEIR (6/10)

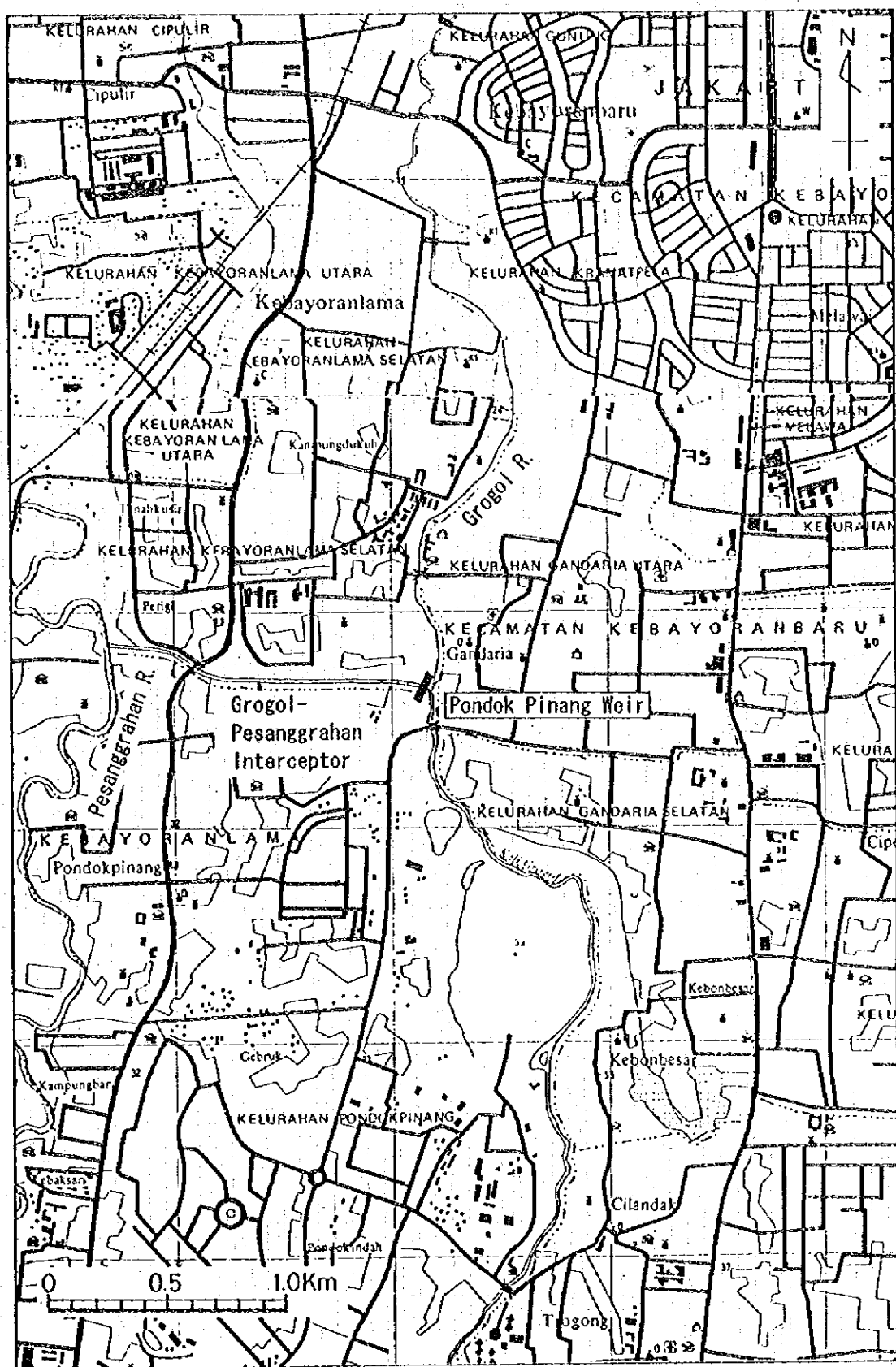


Figure 2.2 LOCATION MAP OF PONDOK PINANG WEIR (7/10)

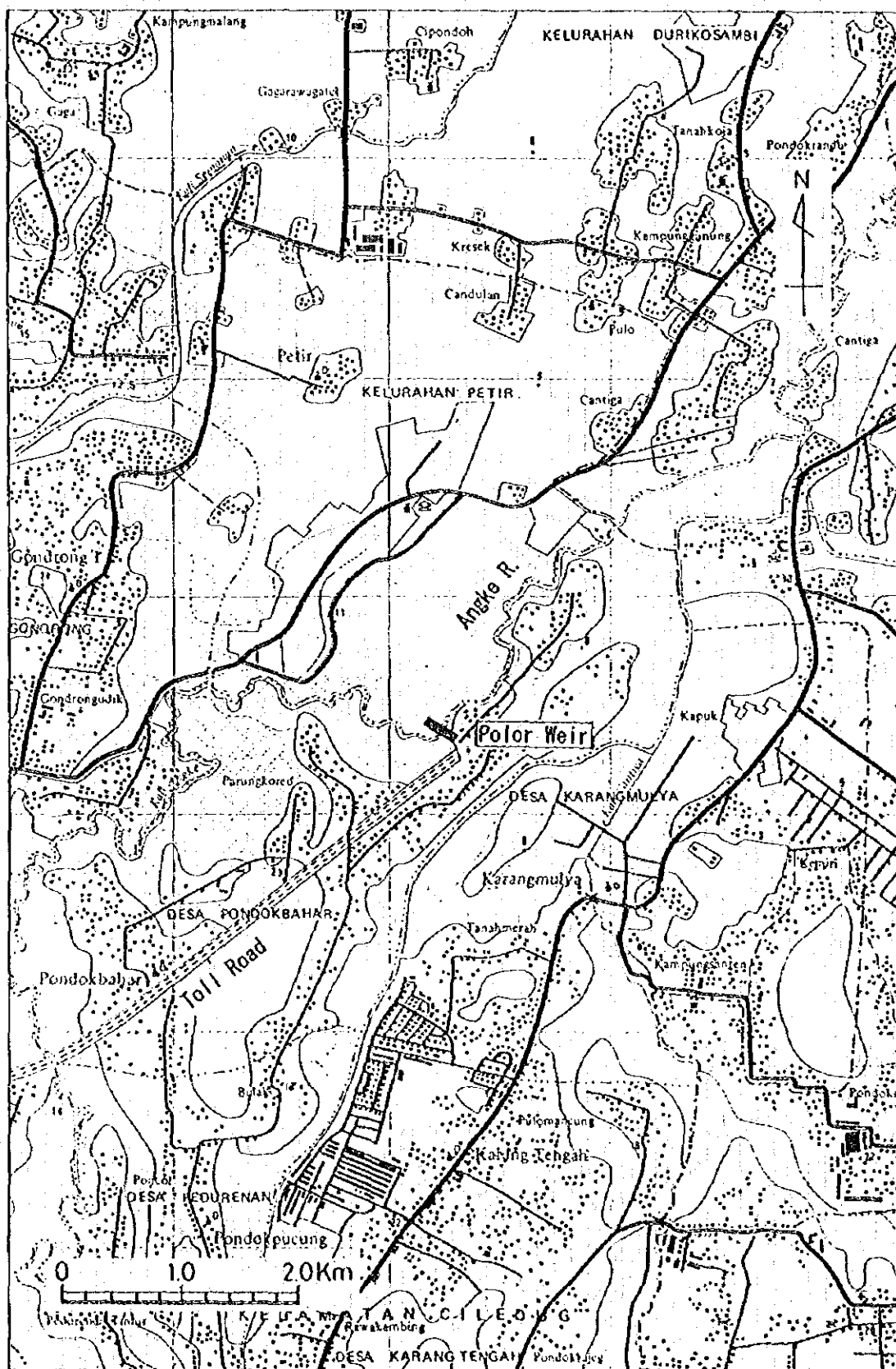


Figure 2.2 LOCATION MAP OF POLOR WEIR (8/10)

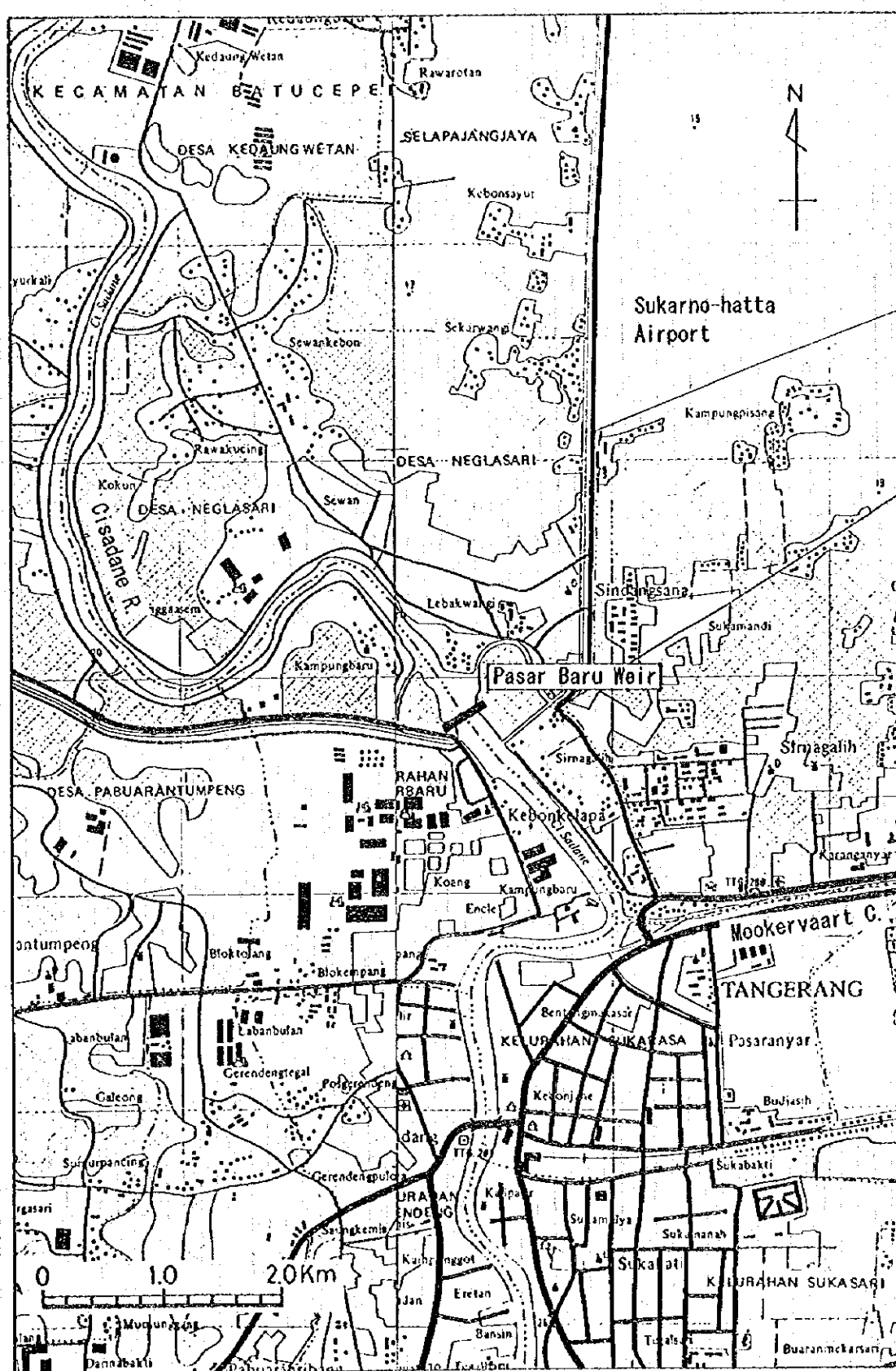


Figure 2.2 LOCATION MAP OF PASAR BARU WEIR (9/10)

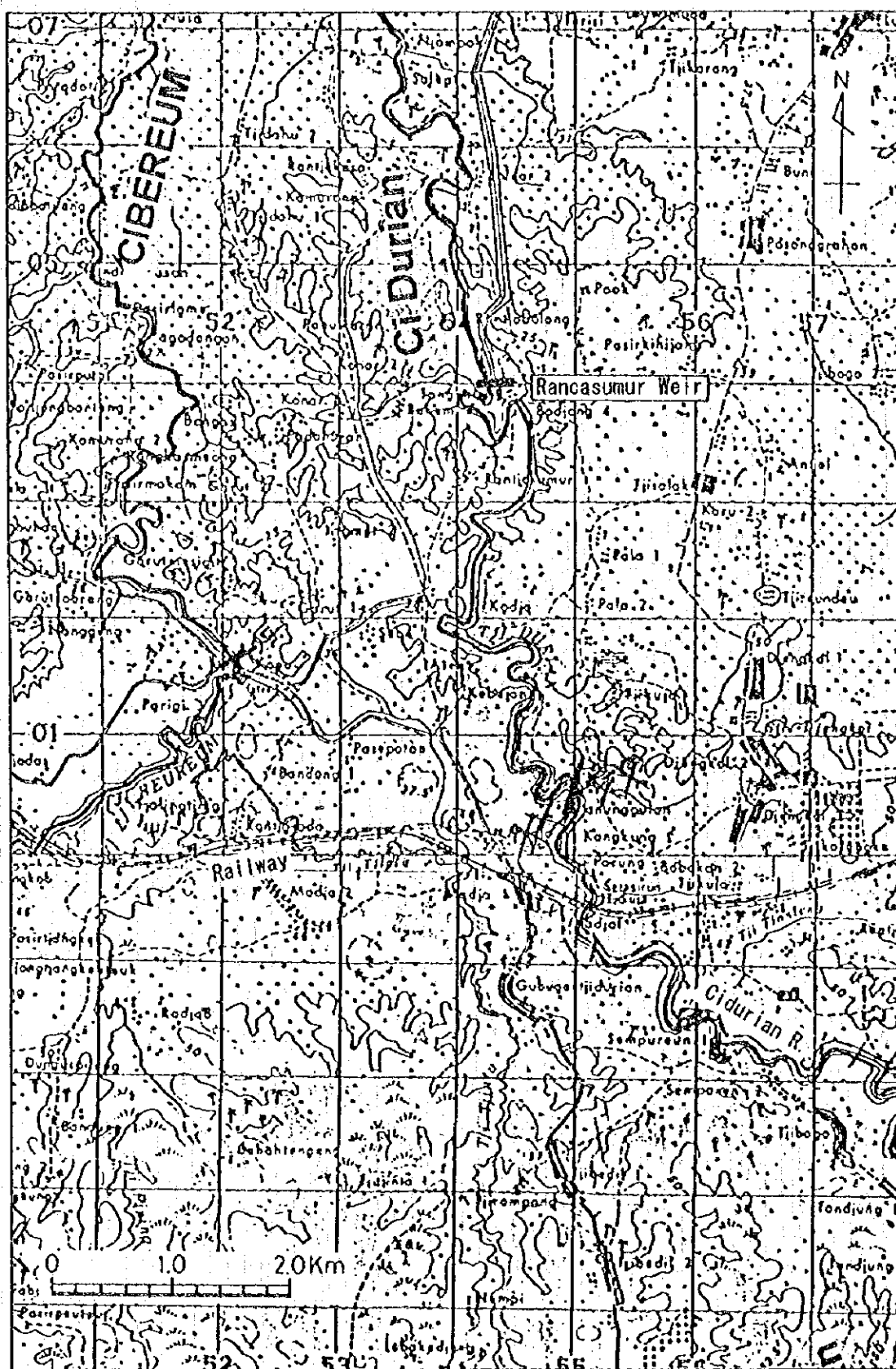


Figure 2.2 LOCATION MAP OF RANCASUMUR WEIR (10/10)

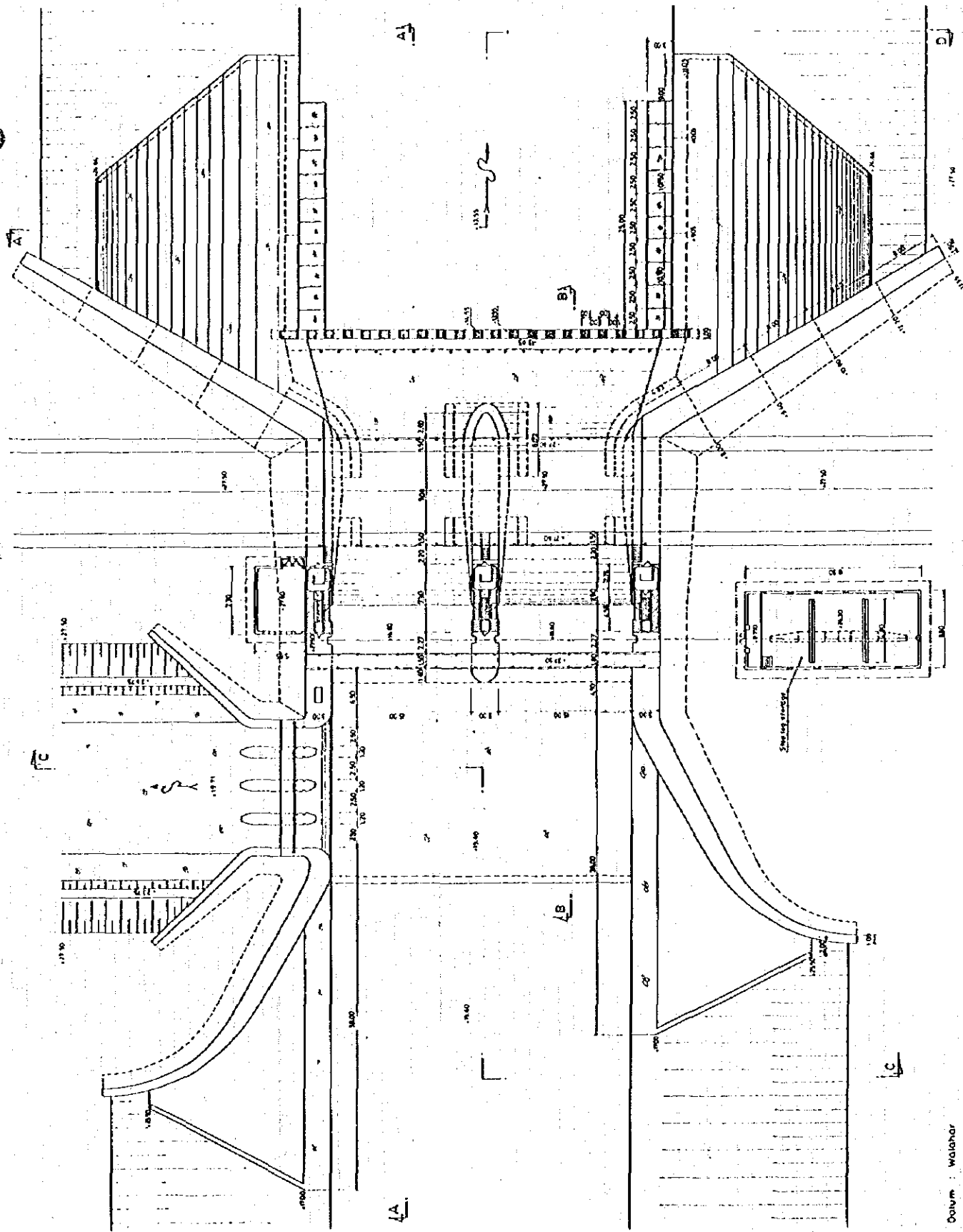
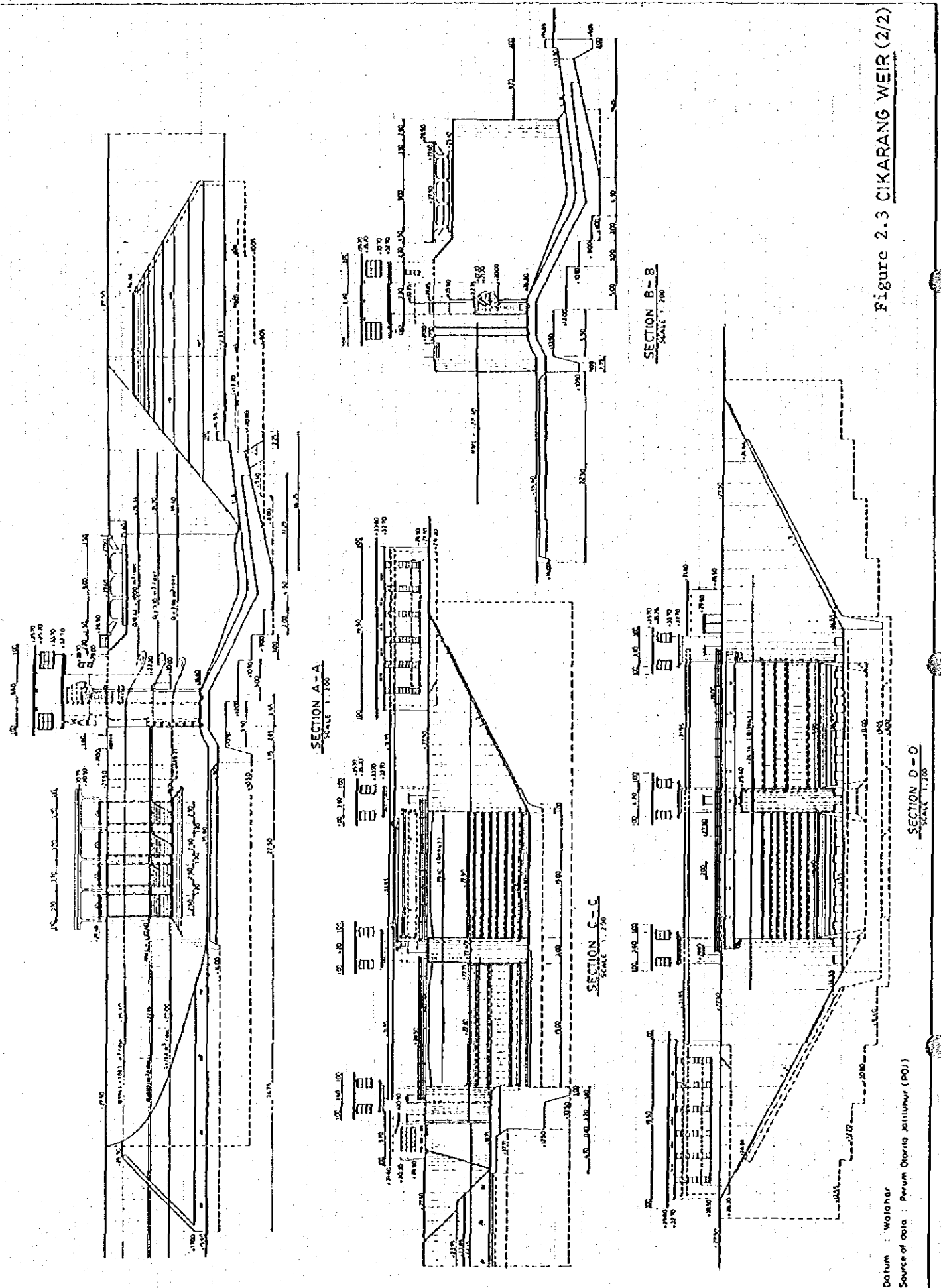


Figure 2.3 CIKARANG WEIR(1/2)

P L A N
SCALE 1:200

Datum : Walandar
Source of data : Perum Daria Jatiunur (PDJ)



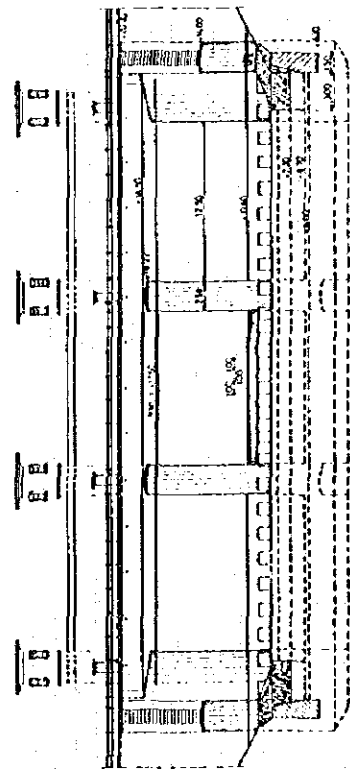
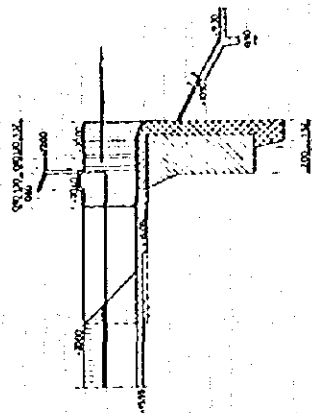
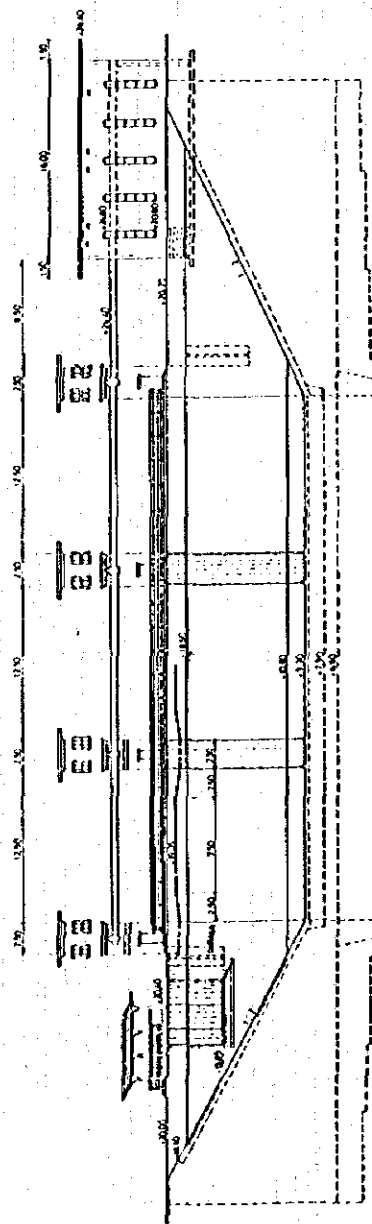
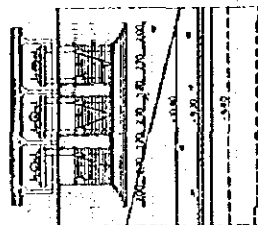
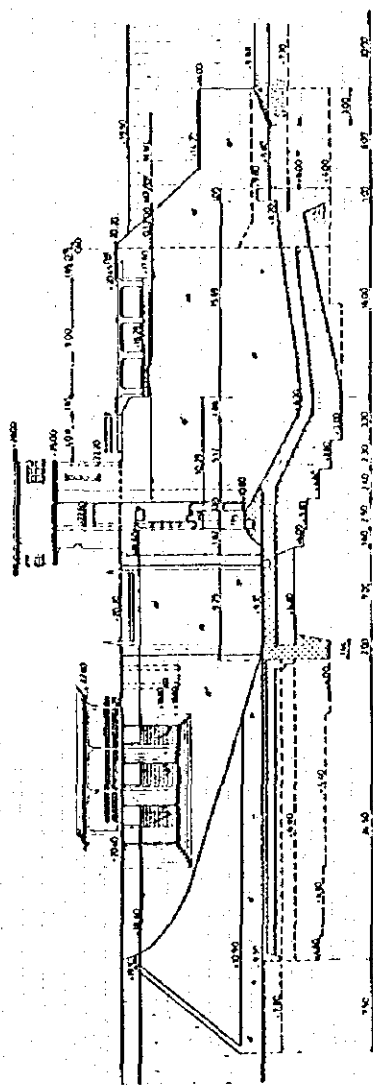
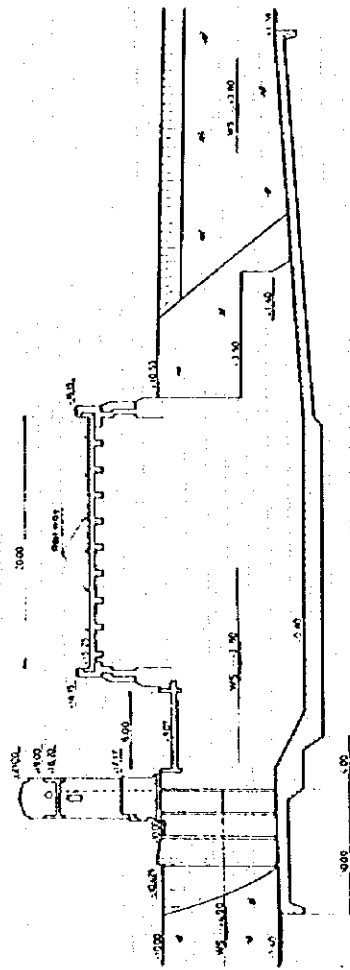
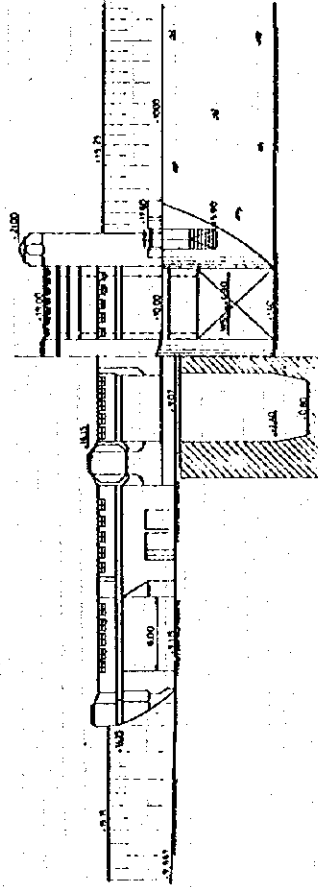


Figure 2.4 BEKASI WEIR
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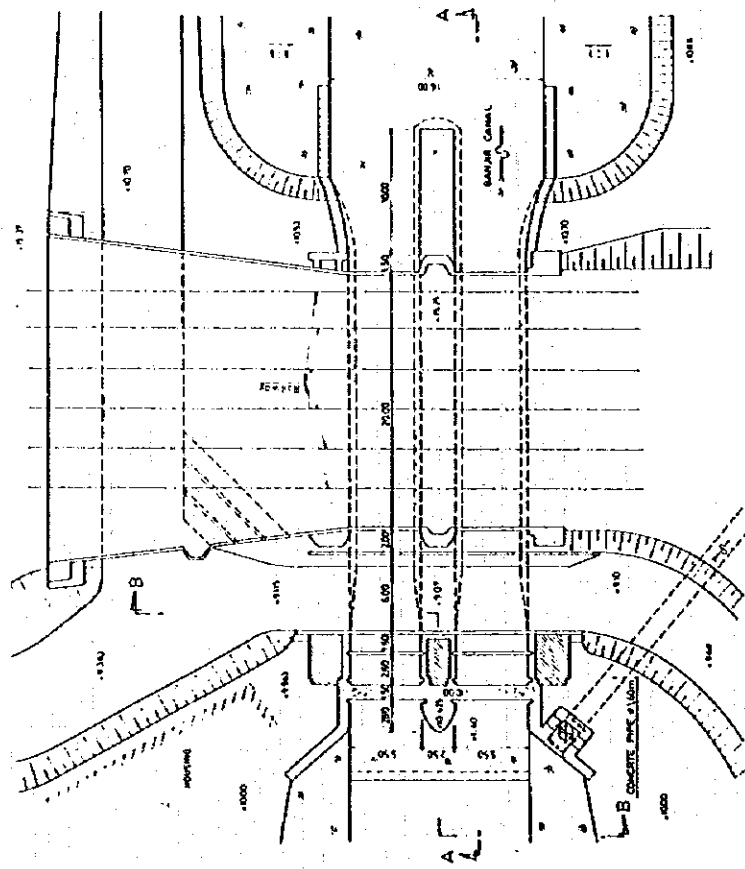
Datum : wahana
Source of data : Perum Orienta Jatiuhur (POJ)



SECTION A-A
SCALE 1:200

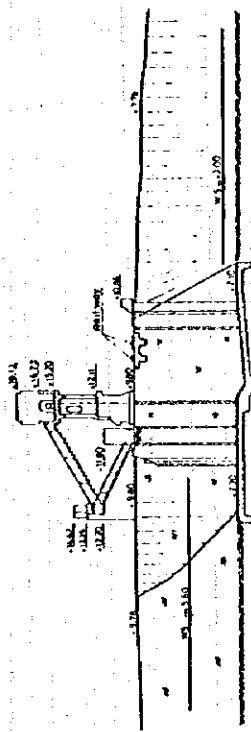


SECTION B-B
SCALE 1:200

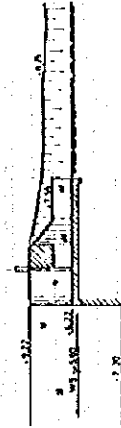


PLAN
SCALE 1:200

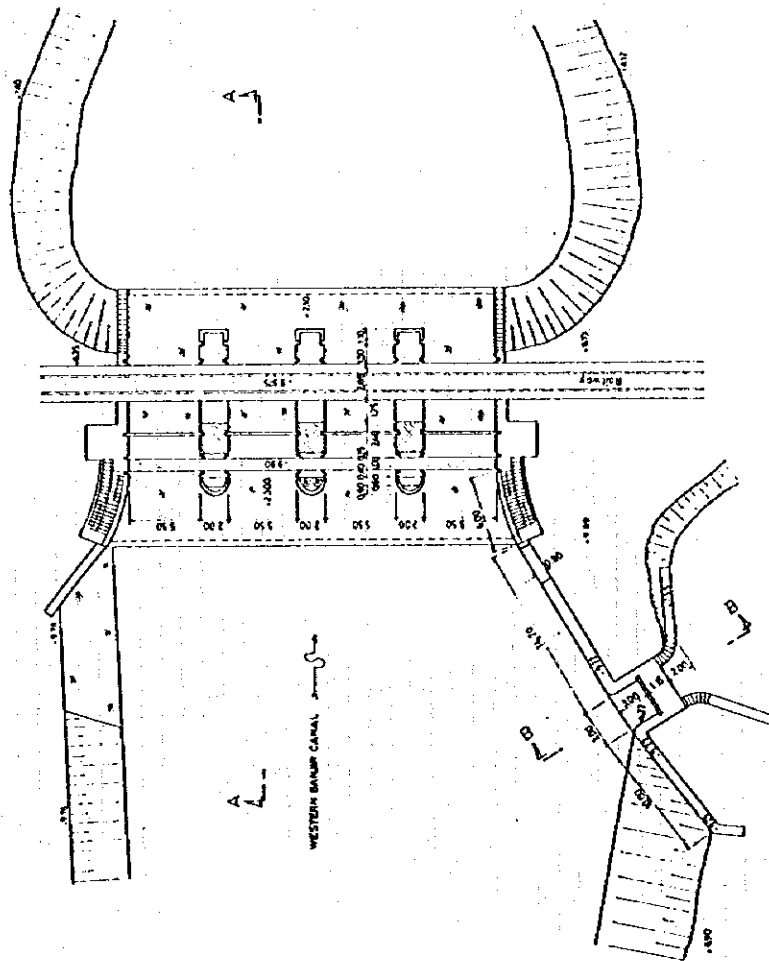
Figure 2.5 MANGGARAI WEIR



SECTION A-A
SCALE 1:200



SECTION B-B
SCALE 1:200



PLAN
SCALE 1:200

Figure 2.6 KARET WEIR

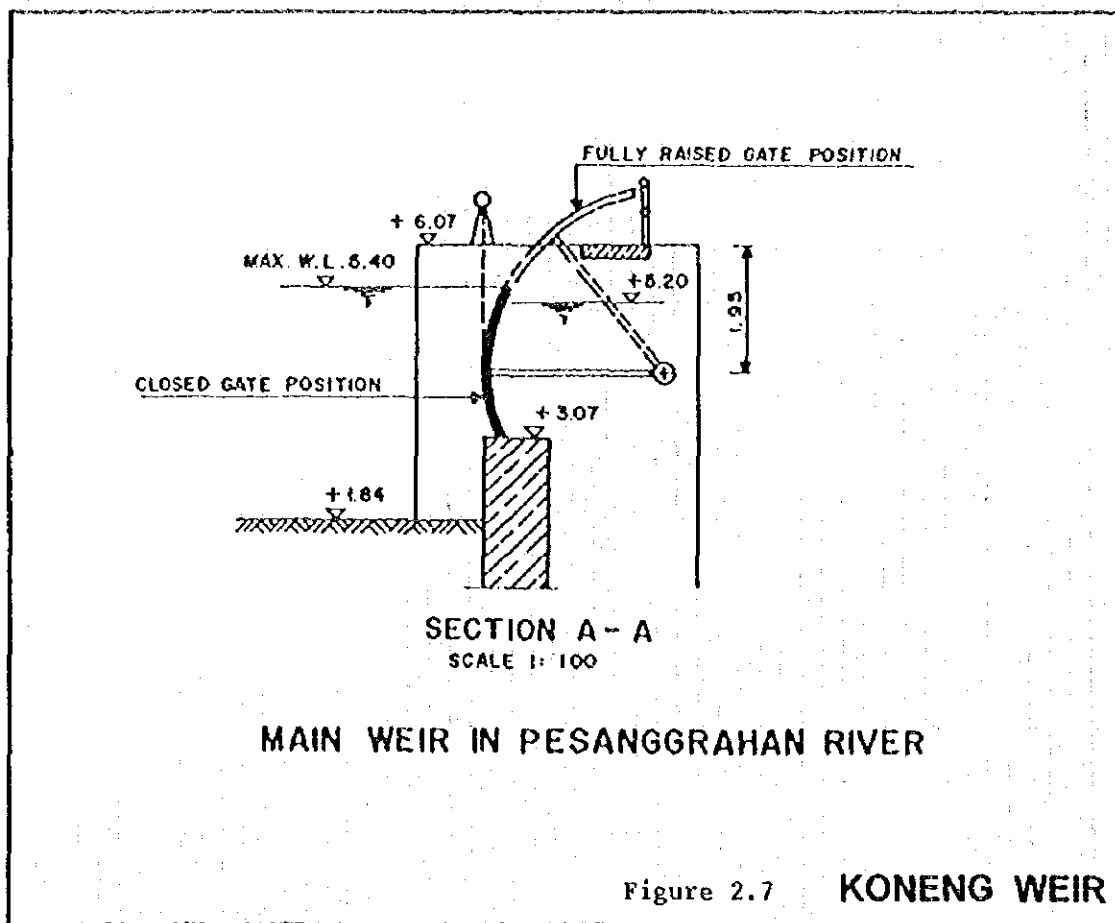
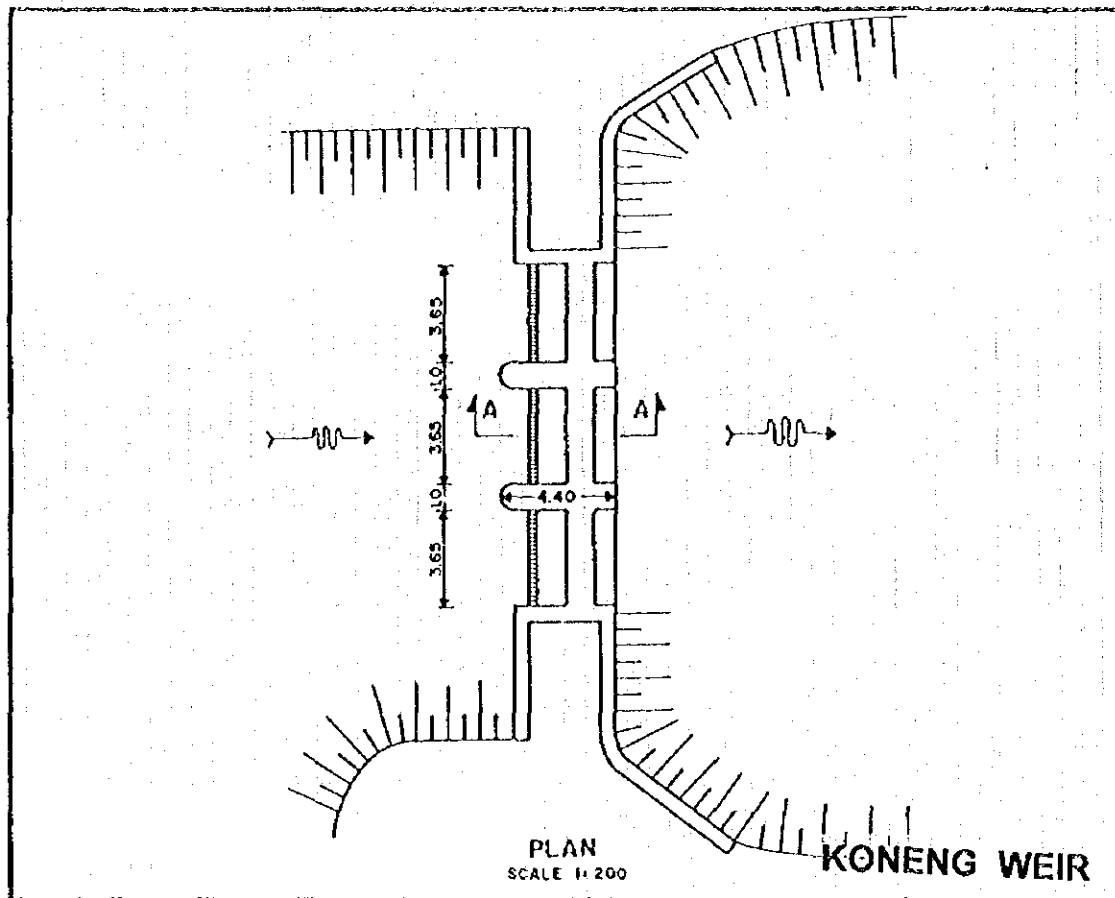
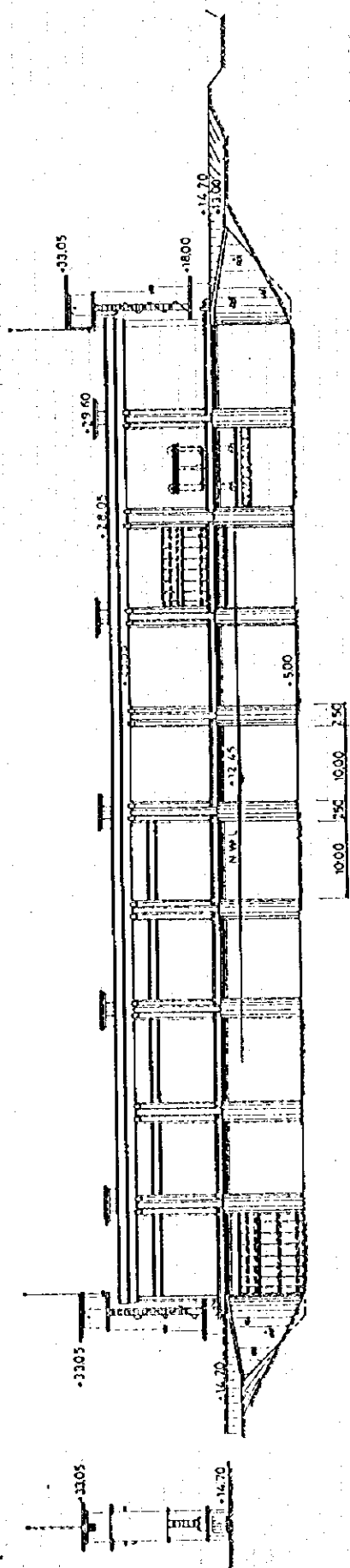
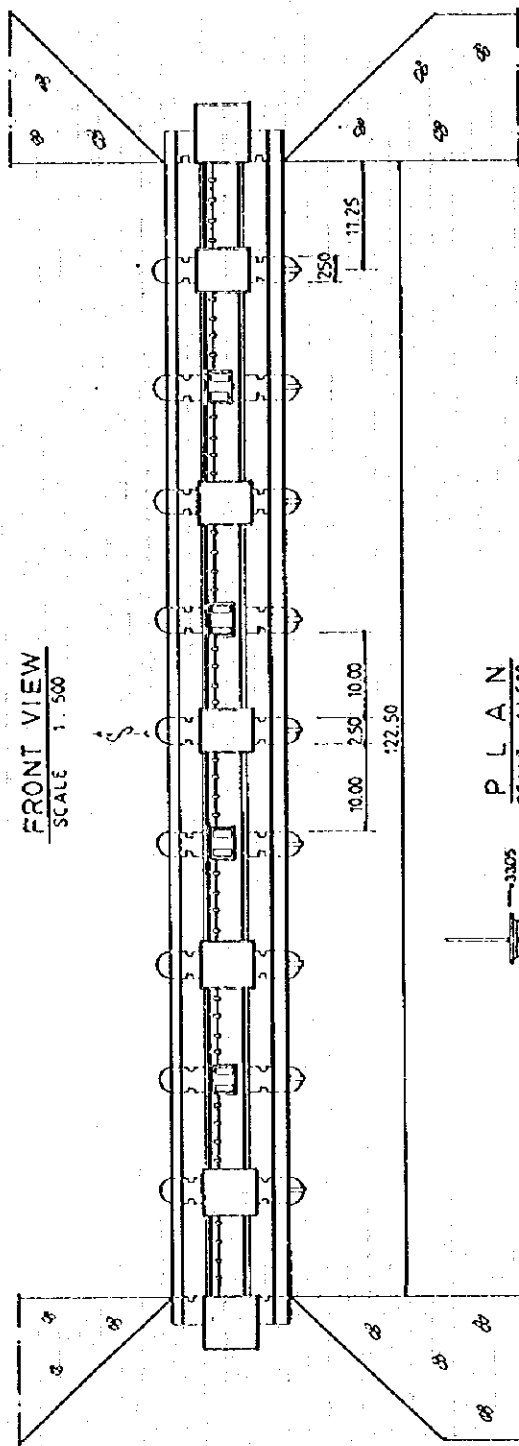


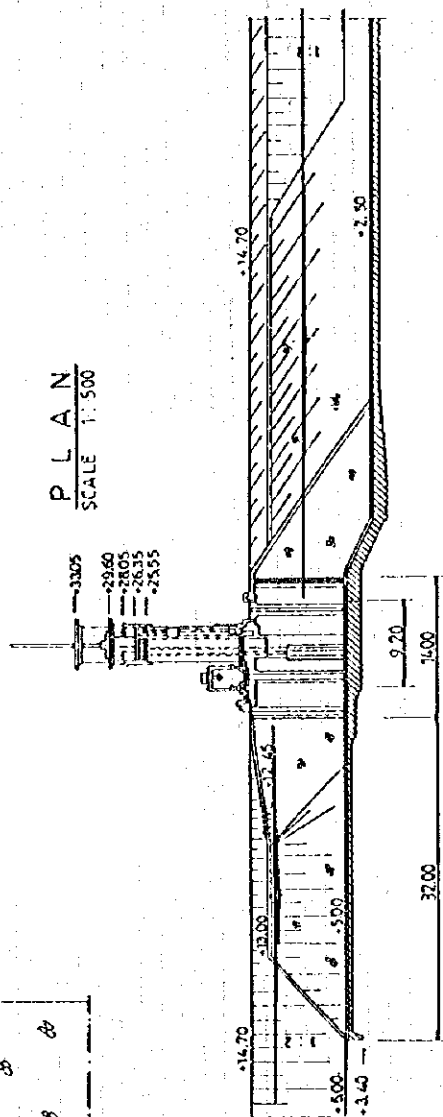
Figure 2.7 KONGENG WEIR



FRONT VIEW
SCALE 1: 500



P L A N
SCALE 1: 500



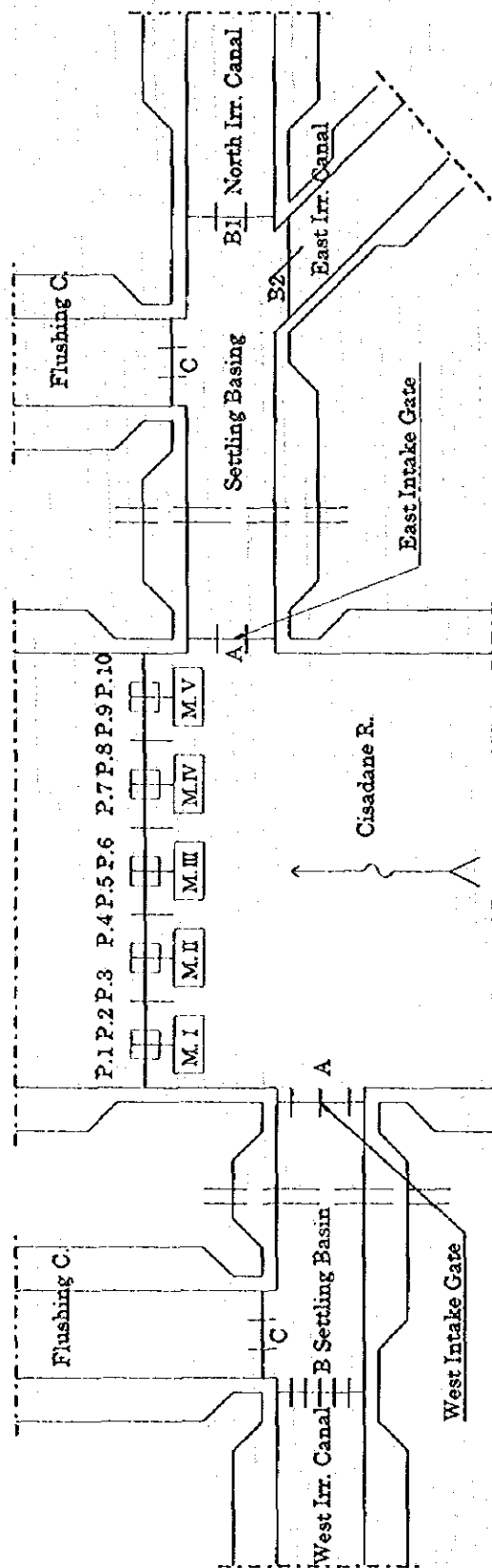
LONG SECTION
SCALE 1: 500

Figure 2.9 PASAR BARU WEIR

Source of Data : Cabang Dinas PU Pengairan
Tangerang

Stage	Gate Operation		Remarks
	Gate I	Gate II	
0			- Normal condition
I			- Operate to open flap gate I & II. - $Q \approx 100 \text{ m}^3/\text{s}$
II			- Operate to close flap gate II. - Prepare to open main gate II.
III			- Operate to close flap gate I. - Operate to open main gate II.
IV			- Emergency condition - Operate to open both main gates. - $Q > 100 \text{ m}^3/\text{s}$

Figure 2.10 GATE OPERATION OF CIKARANG WEIR



Hydrological Condition at Serpong		Gate Operation of Pasar Baru Weir										Gate Operation of Intake Canal		
Water level (m)	Discharge (m ³ /s)	1	2	3	4	5	6	7	8	9	10	A	B	C
+0.60 ~ +1.40	0.850 - 52	I	I	I	I	I	I	I	I	I	I	Full Open	Full Open	Close
+1.40 ~ +1.90	52 - 101	I	I	III	III	I	I	III	III	I	I	Full Open	Full Open	Close
+1.90 ~ +2.40	101 - 166	II	II	II	II	II	II	II	II	II	II	Full Open	Open 1/2	Open 25 cm
+2.40 ~ +2.90	166 - 247	II	II	II	II	IV	IV	II	II	II	II	Open 1/2	Open 1/2	Open 25 cm
More than +2.90	> 247	IV	IV	IV	IV	IV	IV	IV	IV	IV	IV	Close	Close	Close
Sand-flash		Operate based on discharge condition										Full Open	Close	Full Open

Figure 2.11 GATE OPERATION OF PASAR BARU WEIR (1/2)

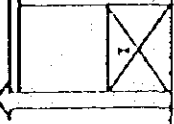
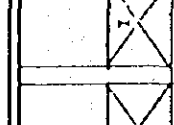
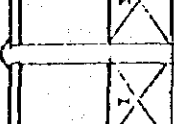
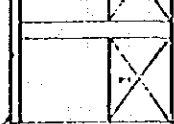
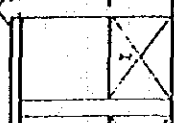
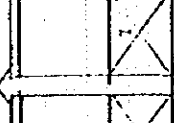
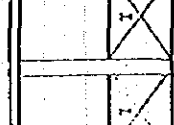
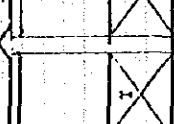
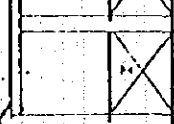
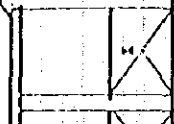
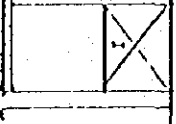
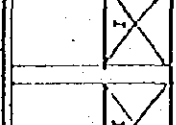
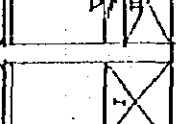
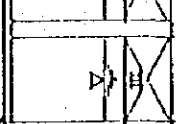
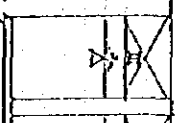
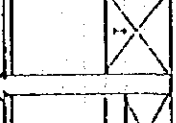
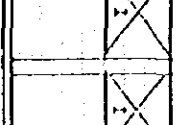
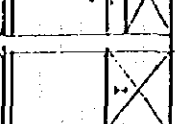
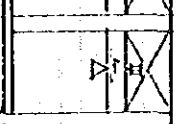
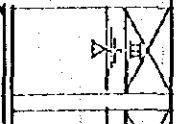
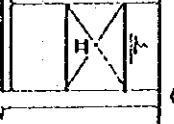
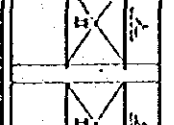
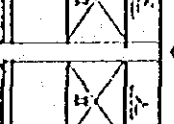
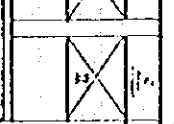
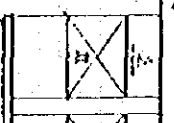
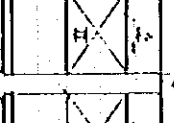
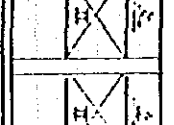
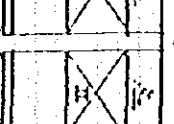
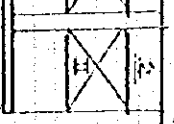
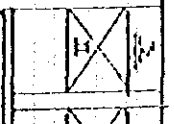
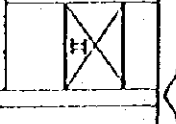
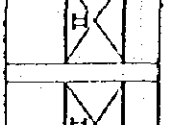
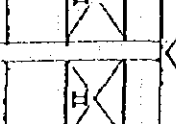
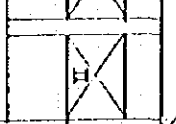
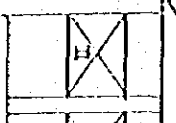

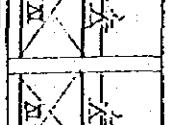
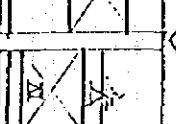
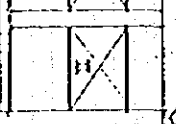
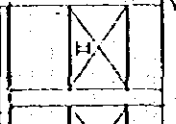
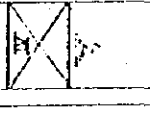
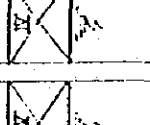
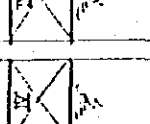
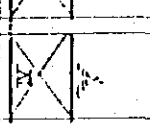
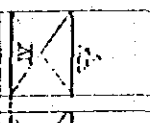
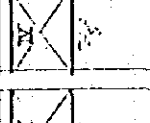

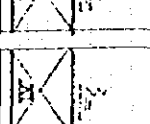
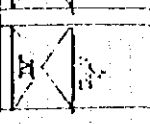
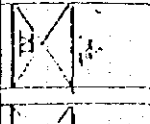
Hydrological Condition at Serpong		Gate Operation of Pasar Baru Weir									
Water Level (m)	Discharge (m ³ /s)	1	2	3	4	5	6	7	8	9	10
+ 0.60 ~ + 1.40	0.850~52										
+ 1.40 ~ + 1.90	52~101										
+ 1.90 ~ + 2.40 (Sand-flash)	101~166										
+ 2.40 ~ + 2.90	166~247										
More than + 2.90	> 247										

Figure 2.11 GATE OPERATION OF PASAR BARU WEIR (2/2)

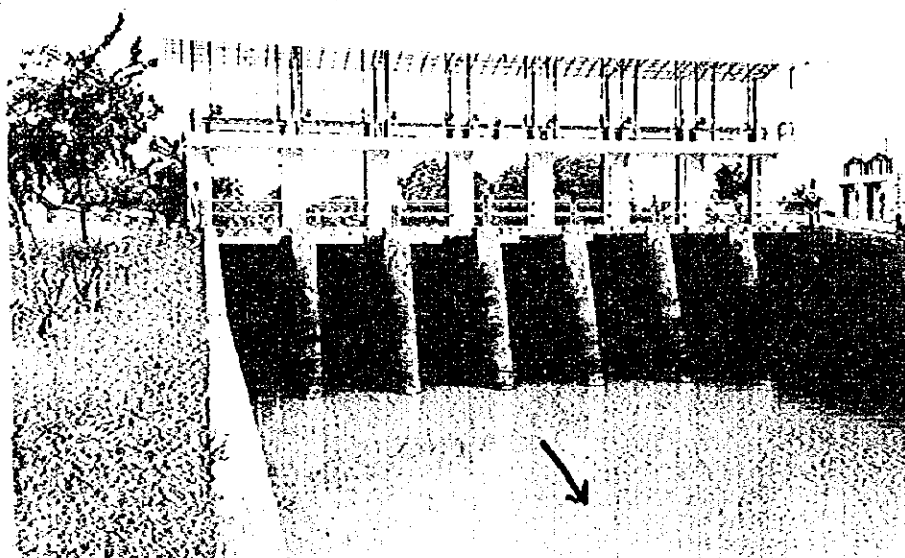
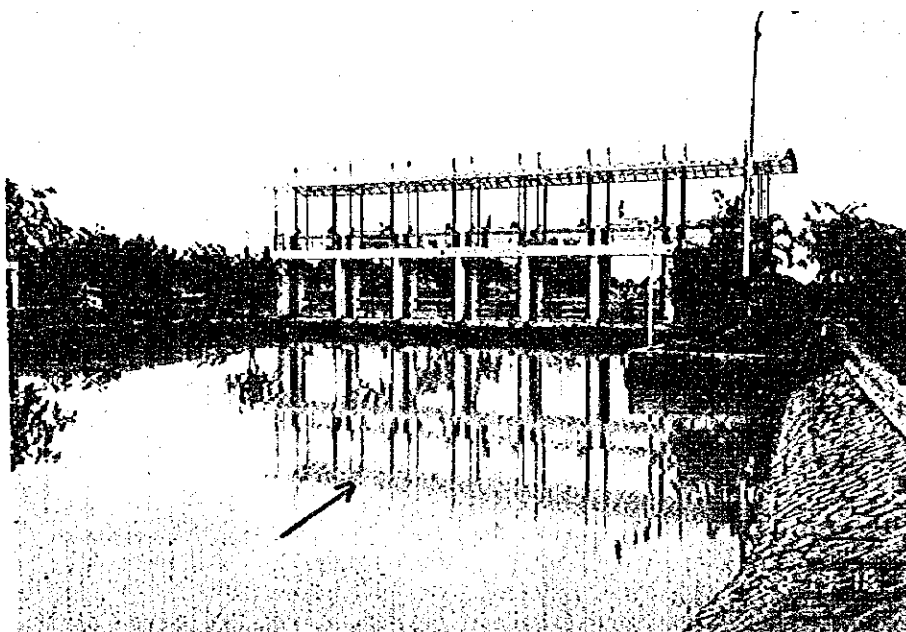


Figure 2.12 LEMAHABANG WEIR

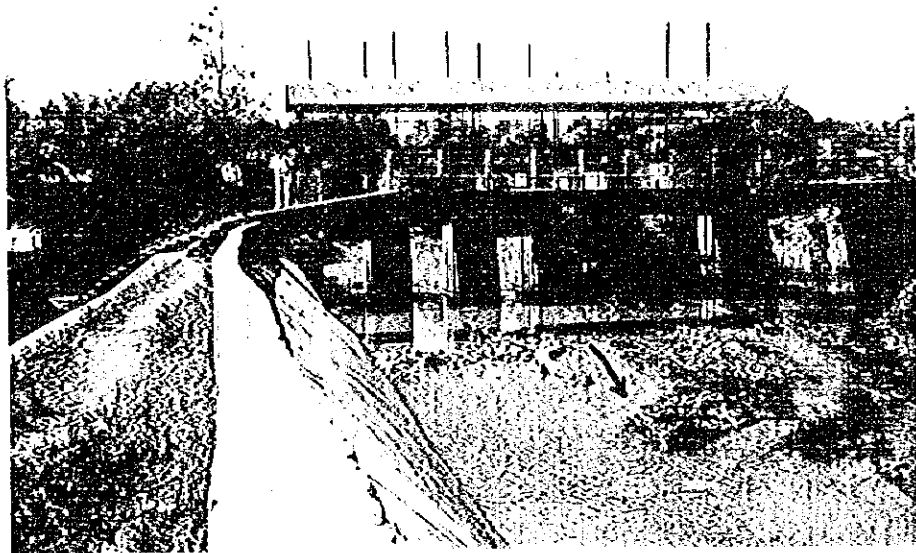


Figure 2.13 PONDOK PINANG WEIR

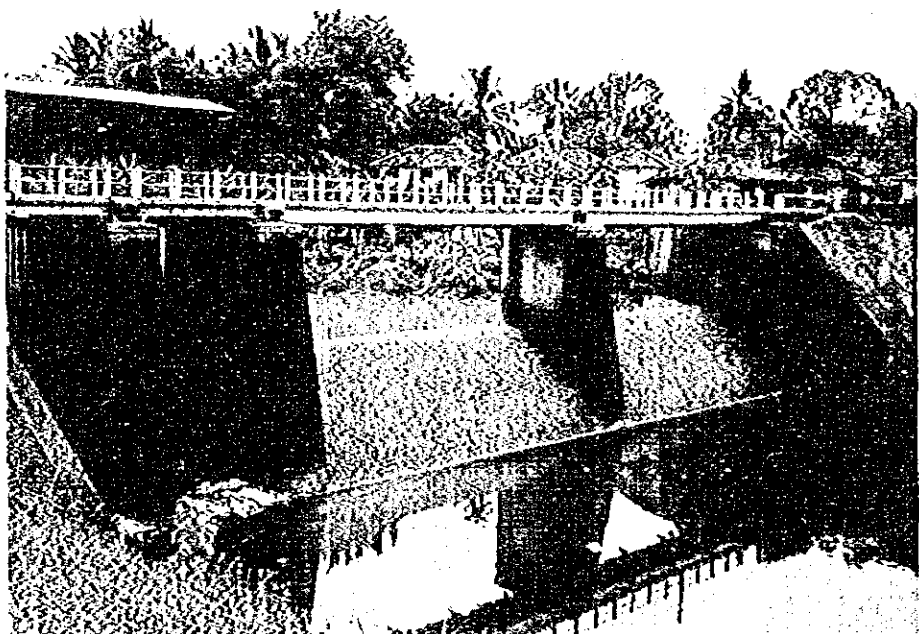
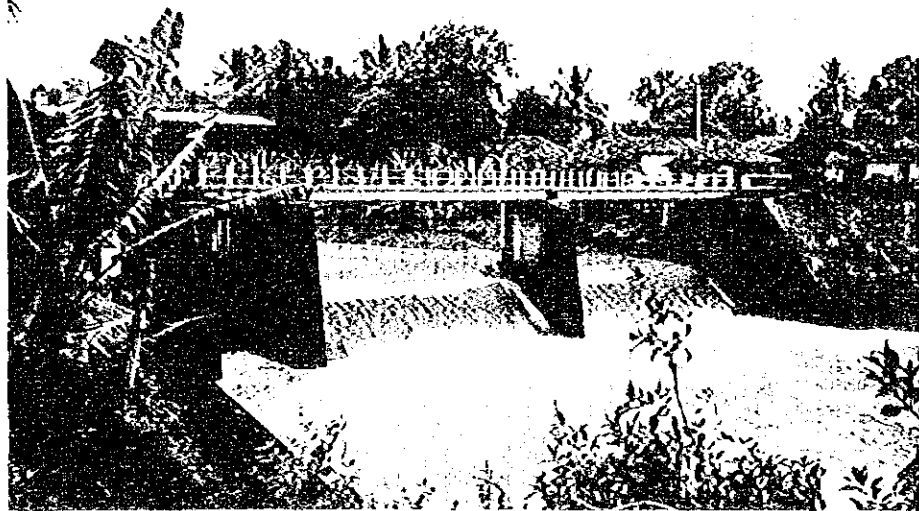
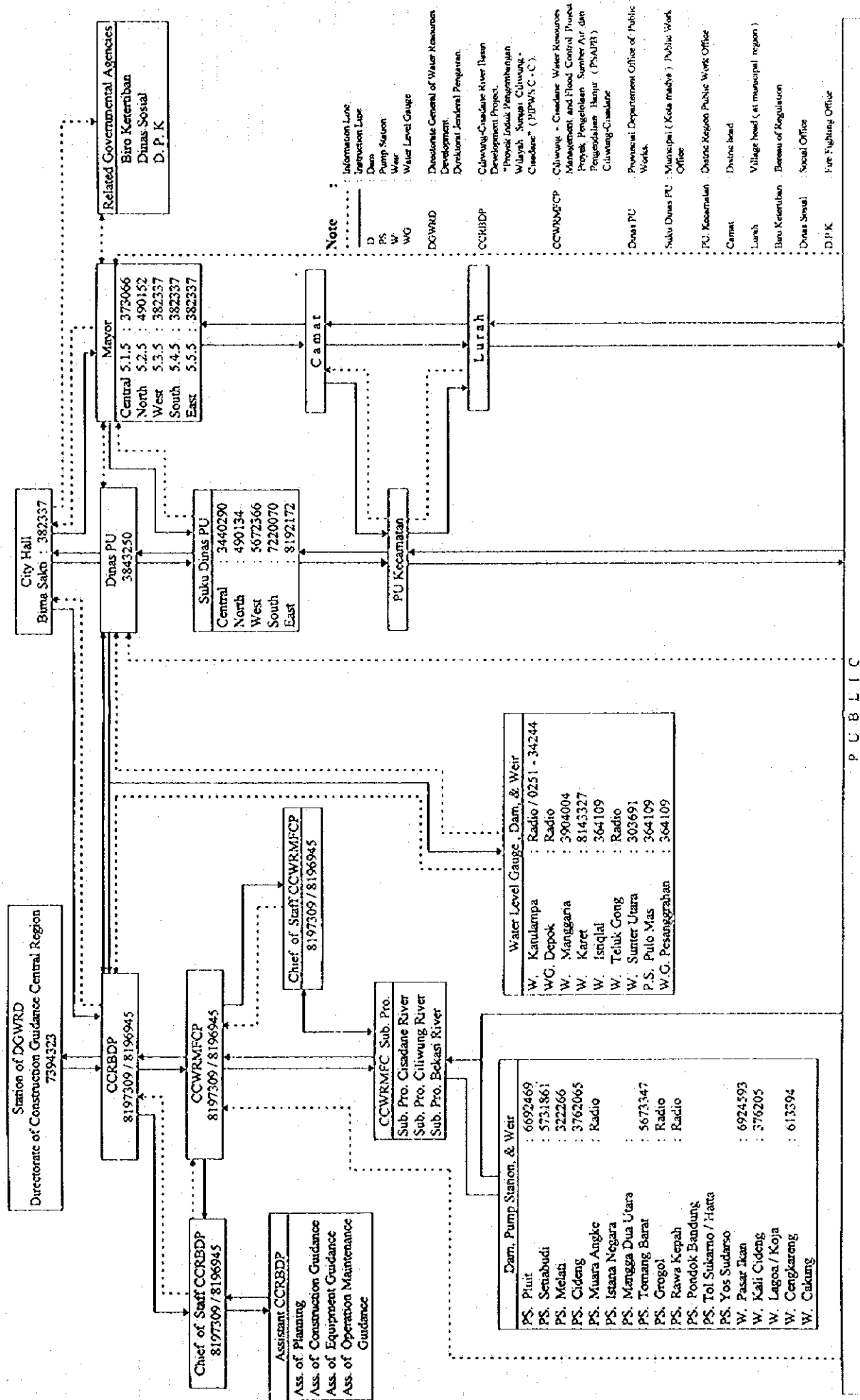


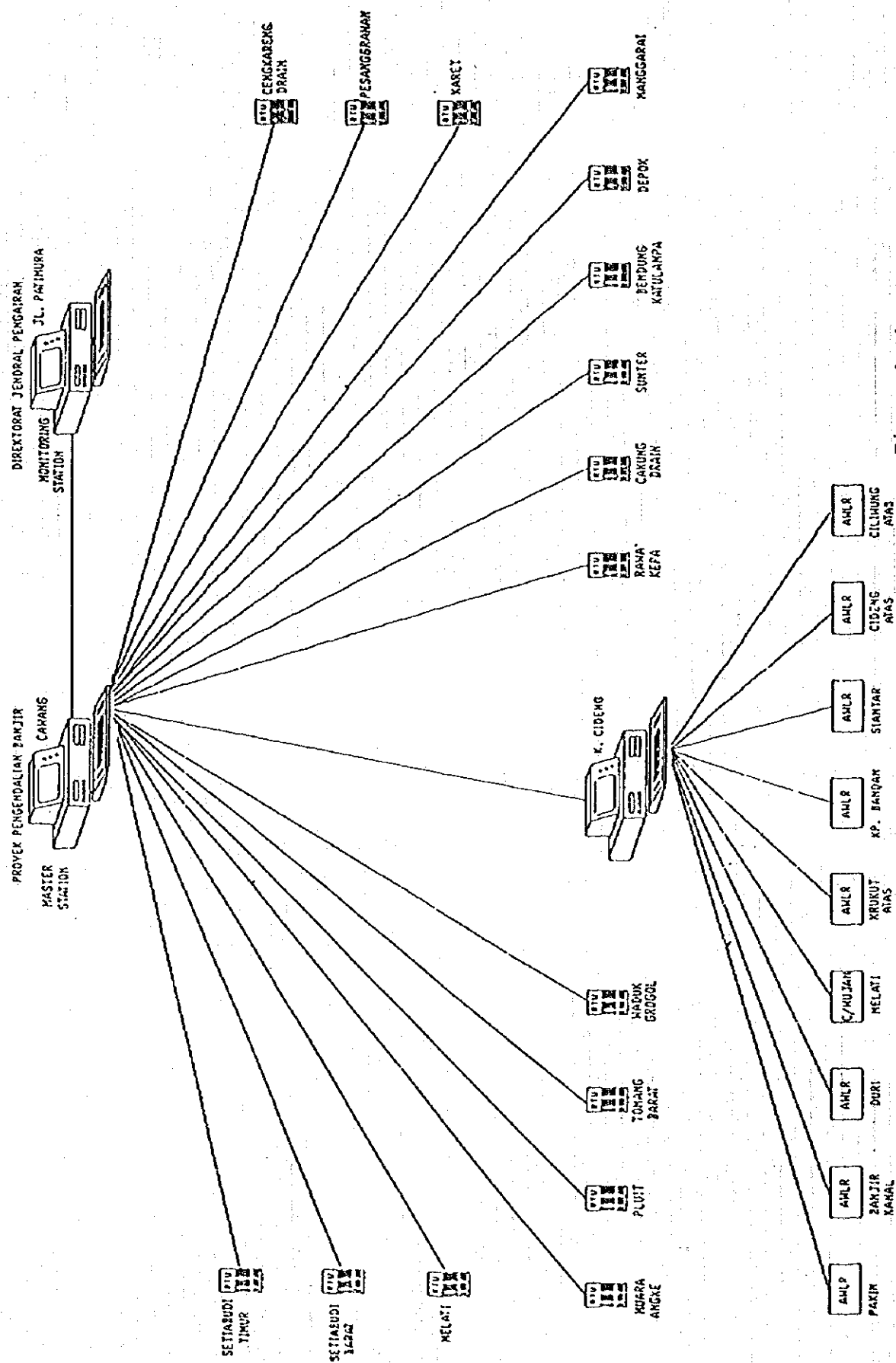
Figure 2.14 RANCASUMUR WEIR

**INFORMATION SYSTEM / INUNDATION REPORTING / FLOOD
AREA OF CILIWUNG - CISADANE WATER RESOURCES MANAGEMENT
AND FLOOD CONTROL PROJECT (CCWRMFCP) / CILIWUNG - CISADANE RIVER BASIN
DEVELOPMENT PROJECT (CCRBDP).**



P U B L I C

Figure 2.15 INFORMATION AND REPORTING SYSTEM FOR FLOOD CONTROL



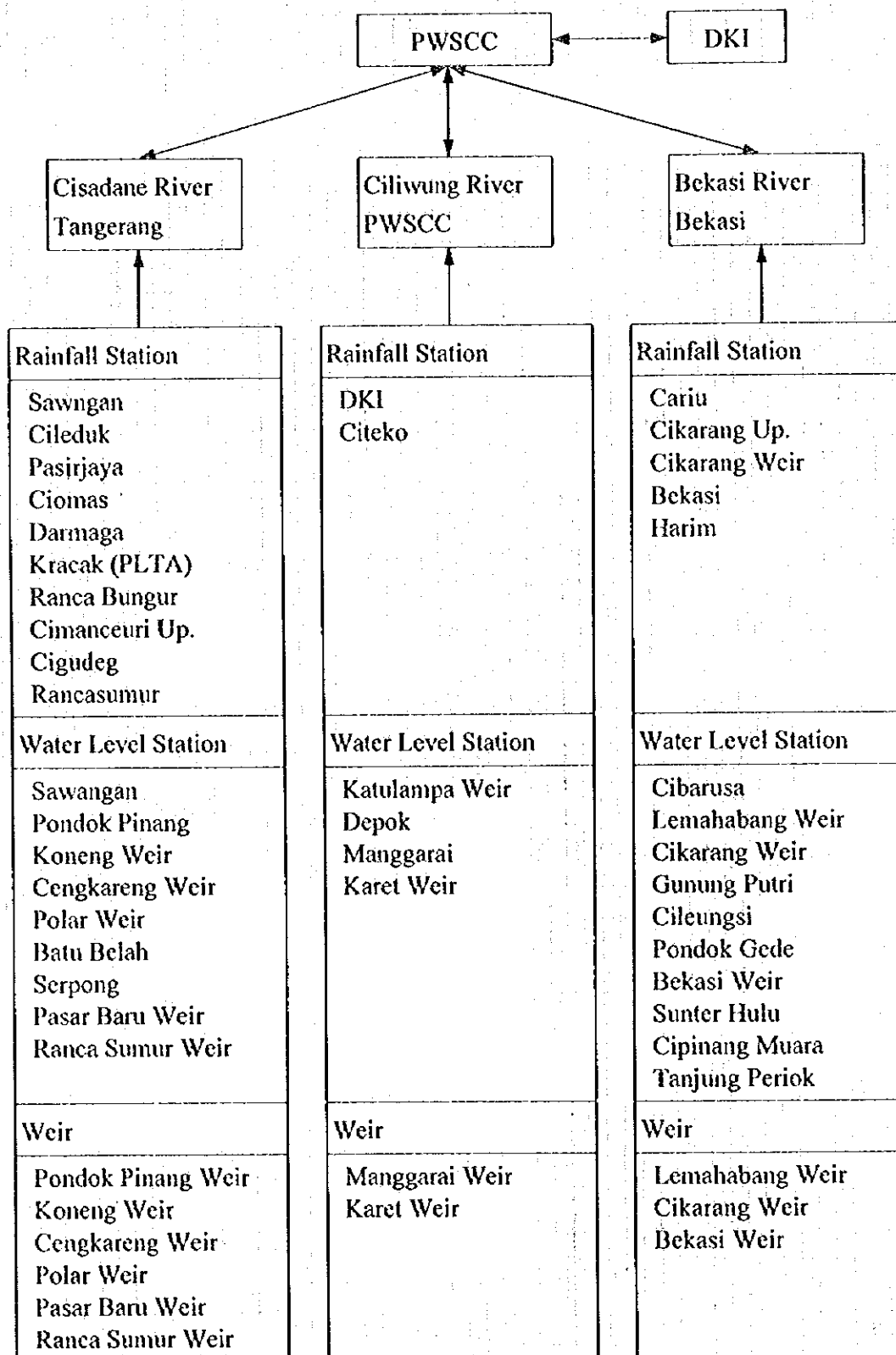


Figure 3.2 HIERARCHY OF MONITORING SYSTEM

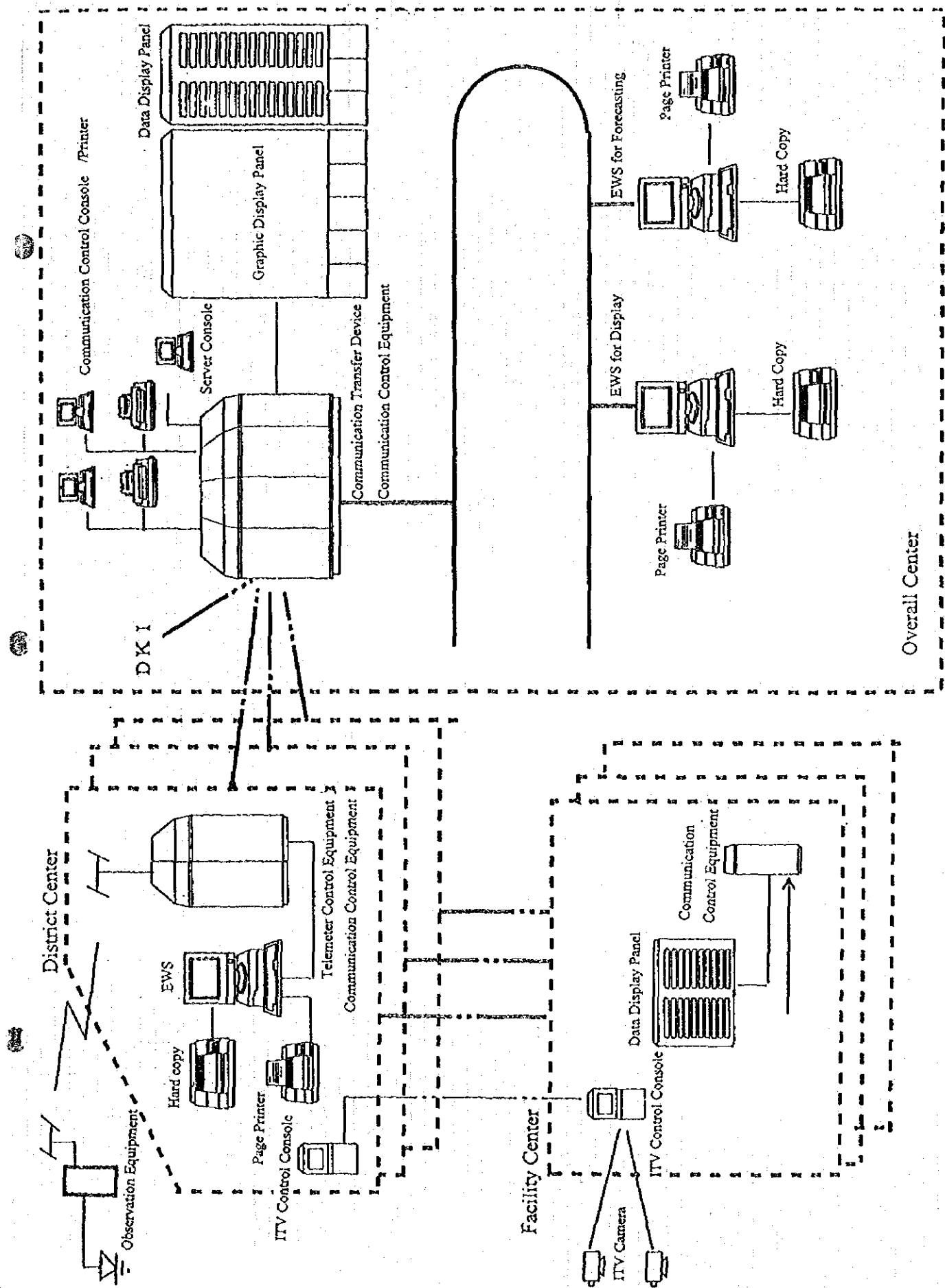


Figure 3.3 GENERAL VIEW OF FACILITY OF MONITORING SYSTEM

ANNEX 12

INSTITUTIONS

**THE STUDY ON
COMPREHENSIVE RIVER WATER MANAGEMENT PLAN
IN
JABOTABEK**

Annex 12 : Institutions

Table of Contents

1	GENERAL	1
2.	A BRIEF ILLUSTRATION ON "WATER RESOURCES " IN INDONESIA ----	1
2.1	In the Period Before Year 190	1
2.2	In the Period Between Year 1970 - 1985	2
2.3	In the Period Between Year 1985 - 1995	2
3.	WATER RESOURCES LEGISLATION	3
3.1	In the Field of Water Resources	3
3.2	Sequential Legislation	4
3.3	Governmental Regulation	5
3.4	Implementing Legislation	5
4.	TREATMENT OF FLOOD	6
4.1	General Description	6
4.2	Flood Control Effort	7
5.	REGULATION ON FLOOD CONTROL AND FLOOD PREVENTION	8
5.1	Flood Control	8
5.2	Flood Prevention	8
5.3	Flood Prevention in DKI Jakarta and Surrounding	10
5.4	The Future Condition	11
6.	FLOOD CONTROL MASTER PLAN	12
6.1	Ciliwung - Cisadane River Basin	12

6.2	Flood Control Master Plan of Ciliwung - Cisadane River Basin	12
6.3	Feasibility Study	14
6.4	Ground Water	14
7.	FLOOD CONTROL INSTITUTION	15
7.1	Implementation Unit of Ciliwung - Cisadane River Basin Development Main Project	15
7.2	Interrelation of Task within Directorate General of Water Resources	17
7.3	Ciliwung - Cisadane River Basin Management	19
7.4	Institution Development	20
8.	OTHERS	23
8.1	Water Resources Management in Province	23
8.2	Land for River Structures	24
6.3	Sand Mining	24
6.4	Construction of River Structures	25
9.	CONCLUSIONS AND SUGGESTIONS	25
9.1	Conclusions	25
9.2	Suggestions	26
9.3	Notes	27

LIST OF FIGURES

Figure 1	Chart of Organization	28
Figure 2	Chart Coordination Procedure	29
Figure 3	Interrelation between DGWRD and PIPWS Ciliwung - Cisadane	31
Figure 4	Outline and Time Framework of Setting-up the Proposed Institution	32

APPENDICES

Appendix 1	Water Resources Development and Management Policy Strategy
Appendix 2	Quotation from the Report on Proposed Formulation of Institutional Development for JWRMS
Appendix 3	List of Laws and Regulations

1. GENERAL

The study on institutional aspects cover the institutional inventory which is directly or indirectly related to river management, in particular related to flood control. In line with the overall study result, it also covers efforts which need to be taken to enhance the future institution.

The institutional study conducted here is still informative and logically suggestive in nature. In reality later on, all strengthening efforts and institutional development which will be further formulated, will be largely dependent on policy of the Indonesian Government in general, Minister of Public Works in particular.

In the study, "Institution" is understood as " a complete set of organization structure with its working procedure, facility and infrastructure of working mechanism, to implement a mission. The mission is a compilation of organized idea with certain goal.

"Certain goal" means " the water resources management" and "mission which is compiled from organized idea" is decision pertaining to tasks and functions of the Government compiled in "legislation" (laws and regulations).

Various agencies are involved in dealing with flood control works, in particular those which are related to land matters and crossing of flood control infrastructures with other structures. To cope with problems which will arise, it is important to make efforts which accommodate institutional approach since the planning, construction, operation and maintenance stages. All must be based on the prevailing legislation and in order that the implementation of each management aspect is able to run institutionally, the said legislation is necessary to be developed accordingly.

2. BRIEF ILLUSTRATION ON "WATER RESOURCES" IN INDONESIA

2.1. In the period before year 1970

In accordance with the policy of the Government in that time, the development of water and water sources mostly is directed for electric hydropower development and rehabilitation of irrigation networks which are damaged because of the war independence and in some regions, reservoirs for irrigation are being constructed. From the viewpoint of institution, the prevailing legislation is still using and continuing the old legislation (formulation resulted during Dutch colonial era and Japanese occupation).

Various efforts have been made to formulate legislation which is in line with the development demand of the independent era, however due to some constraints among other constraint of human resources, up to the end of 1969, the said expectation had not yet been

achieved. In 1966 - 1968, big flood which can be classified as national catastrophe striking various regions in Java and outside Java had occurred. Various efforts to control the flood were made using available capability. An organization which has the responsibility to deal with flood control is the Directorate General of Water Resources Development (1966).

2.2. In the period between year 1970 - 1985

In the year 1969 the Government had decided to initiate Stage I of National Development for the period of five years (Stage I Five Year Development - PELITA I). PELITA I covers the implementation of big and important program i.e. Enhancement Program of Food Production, mostly rice. Directorate General of Water Resources Development has the responsibility to rehabilitate irrigation networks which directly can support the enhancement program of food production. Activities to control flood are conducted to complement the program covering flood control to protect food production area, population settlement area/consumption area, and distribution facility or transportation between production and consumption area. Implementation of the program has run well and smoothly, so that at the end of PELITA III (1984) condition of food self-supporting could be nationally accomplished.

From the viewpoint of institution, it can be noted that efforts to formulate national legislation have already been achieved i.e. with the enactment of Law No. 11 year 1974 on Water Resources. Later on it was followed by the issuance of Government Regulation No. 22 year 1982 on Water Management and Government Regulation No. 23 year 1982 on Irrigation. Although Law No. 11 year 1974 had already included broad coverage of mission pertaining to water resources, however due to some constraints, among other budget limitation, other programs had not yet been able to be duly implemented. The Enhancement Program of Food Production is still being continued in order to keep balance with the increasing population growth.

2.3. In the period between year 1985 - 1995

In the year 1985, increasing demand of water and water source supply from various sectors among other industry, fishery, municipality, and electric power has appeared so that it is felt necessary to develop progressive water resources development pattern in order to be aware of the existing occurrence of development and in addition consistently serves and supports the increasing development of food production.

Important program which has to be paid attention to in water resources sector is the non-oil

industrial development program for enhancement of export volume, which needs substantial support of water and water resources supply. Rapid development of non-oil industry, population settlement area and other cultivation area requires substantial supply of water and water resources.

To be aware of the condition and realizing that supply of water and water resources has limitation with the dimension of time-space-quantity-quality (in Indonesian term called "warung jamu" i.e. waktu-ruang-jumlah-mutu) various legislations in dealing with the matters have been prepared so that the balance between demand and supply can be maintained.

From the viewpoint of institution, development to be noted is that around year 1990 various implementing regulations of the prevailing Laws and Government Regulations have been issued in the forms of Ministerial Regulation, Ministerial Decree and so on which are valid for implementation in the Regions (Province and District) and they can be decided by Minister of Public Works or other related Minister.

Ministerial Decree of Minister of Public Works No. 211/KPTS/1994 dated 28 July 1994, has established the new organization structure within the Ministry of Public Works including Directorate General of Water Resources. The organization structure of Directorate General of Water Resources has undergone considerable change, so that it will need adequate time for consolidation process. For clarification the scheme of the former organization structure (Ministerial Decree of MPW No. 211/KPTS/1984 Jo No. 362/KPTS/1990) and the new one (Ministerial Decree of MPW No. 211/KPTS/1994) is attached as figure no. 1.

3. WATER RESOURCES LEGISLATION

3.1. In the field of Water Resources

The Constitution of 1945 is the basic law for legislation in the Republic of Indonesia. All Laws enacted have to be derived and emanated from Constitution 1945. Law No. 11 year 1974 on Water Resources is the emanation from Constitution 1945, which regulates water and water sources, in particular from Article 33 section (3), which states :

Land and water and natural riches contained herein shall be controlled by the State and utilized for the greatest prosperity of the people.

From the viewpoint of hydrology, the meaning of "water" is the water that follows the natural norm or hydrological cycle. To mention there are atmospheric water, sea water and land water. With respect to "natural riches contained therein", it covers natural riches which are "organic" and "inorganic" in nature.

Law No. 11/1974 on Water Resources covers only land water, which are surface water and groundwater, including sea water which is already in land. With respect to natural riches, it only covers inorganic natural riches.

Taking into account the mission stated in Constitution 1945, it is still necessary to put in legislation the management of sea water and atmospheric water and organic natural riches contained therein.

3.2. Sequential Legislation

As it is stated in the legislation, some provisions have to be further regulated with the implementing regulation among other as follows :

- (a) Right to control of the State has authorized the Government to render licensing pertaining to allocation and utilization of water and water sources, supply based on general plan and project plan of water management.
- (b) Right to control of the State has authorized the Government to delegate authority to Government Agencies in Central and Region as well as to certain legal bodies.
- (c) The Minister in charge of water resources affairs shall be responsible and is hereby empowered to coordinate all efforts pertaining to planning, project planning, supervision, exploitation, maintenance, utilization and conservation of water and water sources.
- (d) Planning with respect to water management and development has to be prepared for the sake of the people in all fields and proper water management based on the Basic Pattern of National Development and is implemented for the interest which is national, regional and local in nature.
- (e) In order that water, water sources and waterworks can perpetually fulfill their functions, they need to be protected, safeguarded and maintained by making efforts to conserve land and water, conduct control of water damage potential against water sources and their surrounding, protection against the occurrence of water pollution.
- (f) And so on (can be studied from the text of Law No. 11/1974).

3.3. Government Regulation

Up to now, several Government Regulations have been issued as implementing legislation of Law No. 11/1974, which stipulate provisions pertaining to river water management and flood control, among other :

- (a) Government Regulation No. 22 year 1982 on Water Resources Management.
- (b) Government Regulation No. 35 year 1991 on Rivers.

The above mentioned Government Regulations contain important provisions, such as :

- (i) The Water Resources Management uses principles of public utility, harmony and conservation.
- (ii) Water Resources Management Pattern covers pattern for conservation, development and utilization of water and water source based on river basin, authority and responsibility of water source and planning with respect to conservation, development of water and water source.
- (iii) One unity of Water Resources Management area is a River Territory (basin) which can consist of one river basin or more.
- (iv) Minister in charge of water resources affairs (according to Presidential Decree No. 18 year 1994 jo Presidential Decree No. 15 year 1984 i.e. Minister of Public Works), besides conducting investigation and study in the framework of preparing formulation and setting-up policy to become water resources development planning, also receives data derived from study result and plan in their respective fields from the related agencies and legal bodies, in Central as well as in Region.

Then, the Minister prepares water resources development plan which have been mutually approved by the agencies concerned, and other necessary information required, as foundation of implementation in their respective fields. For clarification, the procedure is depicted in the attached figure No. 2.

3.4. Implementing Legislation

Based on the related Government Regulation, implementing legislation in the forms of Presidential Decree, Ministerial Regulation, Ministerial Decree, Decree of Director General

and so on are enacted. As it can be seen in figure No. 2, the implementation of Coordination of Water Management as stipulated in Government Regulation No. 22/1982 is regulated in Ministerial Regulation of Minister of Public Works No. 67/PRT/1993. Today the establishment of Provincial Water Management Committee (PWMC) as institution for coordination in the provinces are being disseminated (DKI Jakarta has not yet established the PWMC).

4. TREATMENT OF FLOOD

4.1. General Description

Flood is one of the damage potential of water. There are conditions to be called flood, i.e. :

- (i) Theoretically, when the amount of water (discharge) flowing in the river has already exceeded the design discharge (discharge plan calculated based on the capacity of the river channel), this condition can be called flood.
- (ii) A condition is called flood, when the water flowing in the river, flowed over its river channel. It can among other be described that :
 - (a) Water overflow from the river channel can occur because the discharge is in fact bigger than the capacity of the river channel (heavy rainfall which can be measured by hydro technique computation) so that the water flows over the channel and flood occurs.
 - (b) Flood can also occur because the dike (structure to control flood) in certain location has been damaged so that the river water flows over the river channel.
 - (c) River water flows over its river channel because there are occurring an uplift to the stream in the river channel (particular unexpected condition, such as illegal dwelling houses or structures located in the river channel/flood plain).

In general, what is meant of flood by the public is condition as mentioned in point (ii) above. For personnel in charge of water resources and Government Officials in general, the condition as mentioned in point (i) above is already called flood. Procedure in dealing with flood (preparedness measures, flood information, flood warning and so on) is determined based on flood described in point (i).

4.2. Flood Control Efforts

It is realized, that flood as a nature phenomena, which can not be controlled completely. Flood control measures have to be done, to minimize the damage and the danger caused by flood. Efforts to control flood are in general conducted with two approaches i.e. engineering approach and non-engineering approach or administrative approach. It can be clarified as follows :

(i) Engineering Approach

Basically it is done by constructing flood control infrastructures and facilities by using hydro-engineering technique mainly possessed by water resources experts.

The implementation can be done through several system, such as :

- (a) flood control effort which is implemented by individual approach..
- (b) flood control effort implemented done together integratedly with activities pertaining to water and water sources development in a certain river, as well as in a river territory, and development stages is determined accordingly.
- (c) flood control activities as improvement and strengthening the flood fighting measures (improvement of emergency structures).

(ii) Administrative Approach (Public Administration)

Activities in the framework of administrative approach cover activities which basically deal with the inter-action of behavior between the people/community and the river (water source). It consists of two direction of approaches, namely :

- (a) to make efforts that people/community does not perform activities which are directly an indirectly create condition which can result in flooding, for instance :

- planting of high crops in flood plain.
- using river dike for various activities which indirectly can damage the dike or minimize the strength of the dike (for heavy traffic, livestock tending, land cultivation at the toe of dike and so on)
- construction of structures in flood plain which can minimize the river channel capacity.
- throwing trash (garbage, solid waste) into the river which gradually can minimize the river channel capacity.

- deforestation activities in catchment area of the river (upstream of the river).
 - construction of structures (housing, factories, etc.) on the catchment area of the river, which caused decreasing the absorption capacity of land.
 - incorrect land cultivation on steep-slope land in the catchment area which caused bigger or accelerate run-off flow and land slide.
- (b) During the wet season, activities of flood preparedness, flood prevention and flood surveillance has to be performed by involving the community, in order that the community will be prepared to face flood, so that in case flood really occurs, it can be dealt with accordingly and any losses resulted can be minimized to its minimum level.

Those activities are conducted by issuing government regulation and give guidance to the community how to face flood, through continuous public awareness campaign.

5. REGULATION ON FLOOD CONTROL AND FLOOD PREVENTION

5.1. Flood Control

As it is earlier mentioned, activity of flood control is part of activity of river management. All regulations and activities required refer to provisions stipulated in various legislation as stated in Law No. 11/1974, in particular Chapter VIII (Conservation) article 13 and its implementing legislation, especially :

- Ministerial Regulation of MPW No. 39/PRT/1989 on Division of River Basins.
- Ministerial Regulation of MPW No. 48/PRT/1990 on Management of Water and Water Source in River Basins
- Ministerial Regulation of MPW No. 67/PRT/1993 on Water Management Committee at Provincial Government Level I.

For smooth and perfect implementation in each Region, it is preferable, that guidance and implementation guidelines have to be issued, taking into consideration the condition of the respective river basin.

5.2. Flood Prevention

In the framework to cope with disasters which may occur at any moment including disaster

caused by flood, the Government has established the National Disaster Prevention Coordination Agency (BAKORNAS PB) through Presidential Decree No. 43 year 1990. As Head of BAKORNAS PB is the Coordinator Minister for People's Welfare.

The tasks of BAKORNAS PB are as follows :

- (a) to formulate policy for disaster prevention and to give guidelines or direction and to coordinate disaster prevention in its stages i.e. before, during and after the occurrence disaster integratedly.
- (b) to give guidance and direction pertaining to policies in effort to control disaster by preventive, repressive and rehabilitative measures covering prevention, surveillance, rescue, rehabilitation and reconstruction activities. Based on the Ministerial Decree of Coordinator Minister of People's Welfare/Head of BAKORNAS PB No. 17/KEP/MENKO/KESRA/X/ 1995, the Disaster Prevention Implementation Coordination Unit (Satuan Koordinasi Pelaksana Penanggulangan Bencana - SATKORLAK PB) in Provincial Government Level I and Disaster Prevention Implementation Unit (Satuan Pelaksana Penanggulangan Bencana - SATLAK PB) in Regional Government Level II has been established.

The task of SATKORLAK PB is to conduct coordination and supervision of disaster prevention in its region based on the policy guidelines which has been determined by BAKORNAS PB, before, during and after the occurrence of disaster which cover activities of prevention, surveillance, rescue, rehabilitation and reconstruction.

The task of SATLAK PB is to conduct implementation activities pertaining disaster prevention efforts in its region in line with the policy determined by BAKORNAS PB and/or guidance of Governor Head of Regional Government Level I as Head of SATKORLAK PB consisting the stage before, during and after the occurrence of disaster and cover activities of prevention, surveillance, rescue, rehabilitation and reconstruction.

Note : flood which occurs can be decided as :

- ordinary flood which will be dealt with by the respective agencies with the coordination of Regional Government.
(flood which has occurred recently in Jakarta because of the overflow of Ciliwung River on January 6 and 7, 1996 was decided as ordinary flood and it is dealt with by Regional Government DKI Jakarta).
- flood which has caused disaster and resulted in losses, and is dealt with locally,

regionally, respectively using the procedures of SATLAK, SATKORLAK,

- flood which has resulted disaster and substantial losses (extensive social impacts), so that it can be declared as national disaster by the Head of BAKORNAS PB and to be dealt with nationally.

5.3. Flood Prevention in DKI Jakarta and Surroundings

- (i) As it is described above, provisions pertaining activities on flood prevention is determined by Presidential Decree No. 43/1990. Before the implementing legislation is issued, the flood prevention activities in the Provinces, are executed based on the guidance and guidelines decided by the Governor concerned.

The Ministerial Decree of Coordinator Minister for People's Welfare, has not been enacted until 9 October 1995. For the time being, activities facing the flood, has been implemented according to the guidance of the Governor, which is based on the Ministerial Decrees of Coordinator Minister of People's Welfare/Head of BAKORNAS PB,

- No. 02/KEP/MENKO/KESRA/I/1992, on Organization, Task and Management BAKORNAS PB.
- No. 13/KEP/MENKO/KESRA/IV/1992, on Organization, Task, Function and Management of Working Group BAKORNAS PB.
- No. 14/KEP/MENKO/KESRA/IV/1992 on Position, Organization, Task, Function and Management of the Secretariat of BAKORNAS PB.

- (ii) In DKI Jakarta, activities for flood prevention is based on

Instruction of the Governor Head of DKI Jakarta No. 376 year 1994, dated 17 October 1994 on Preparatory effort for facing the rainy season and flood prevention in DKI Jakarta.

The execution of flood prevention activities are based on

The Decree of Head of Provincial Public Works Agency DKI Jakarta No. 90/1994, on Execution Guidance on Flood Control for the year 1994 - 1995 in DKI Jakarta region.

- (iii) For Ciliwung - Cisadane River Basin, the flood prevention activities, has to be executed based on the Decree of Project Manager of PIPWS Ciliwung - Cisadane No. 568/KPTS/Aa.10.03/1995 on Field Operation Procedure for Pacification the Rainy Season in 1995/1996.

For coordinate implementation, a cooperative teamwork is developed between the Regional Government and PIPWS Ciliwung - Cisadane, which is in general describe as below :

- (a) In DKI Jakarta region, a division of job has been adopted but still in coordinate pattern, and in accordance with the prevailing regulatory arrangement. Particularly, it has been agreed that the flood prevention activities of PIPWS Ciliwung - Cisadane concentrated to 13 rivers.

For the other rivers, which have the function mainly as drainage network, are under the responsibility of Provincial Public Works Agency.

- (b) In West Java Province, the flood prevention activities, are implemented in accordance with the procedure adopted by BAKORNAS PB and under cooperative arrangement by Provincial Public Works Water Resources Agency of West Java.

In general, the flood prevention of rivers flowing in Ciliwung - Cisadane River Basin, are under the responsibility of PIPWS Ciliwung - Cisadane. So is the case, the Decree of Project Management of PIPWS Ciliwung - Cisadane No. 568/KPTS/Aa.10.03/1995 is valid, but implemented within the coordination pattern in accordance with the procedures decided by Governor Head of West Java Provincial Government.

5.4. The Future Condition

- (i) Regulatory arrangement for flood prevention described above, has to be improved and perfectionized to become an overall and integrated regulatory management in the future. The formulation process can be done through the PTPA pattern (Water Resources Management Committee, in line with the provisions stipulated in the Ministerial Regulation of MPW No. 67/1993).

- (ii) The overall and integrated regulatory management will be more in need and required, when the infrastructures and management means for flood control which are constructed in accordance with development program of the definite Flood Control Master plan come to completion. Attention has to be given, to the regulatory arrangements, which has to be issued yearly, in conformity with the stage of the implementation progress of

development.

6. FLOOD CONTROL MASTER PLAN

6.1. Cisadane-Ciliwung River Basin

As it has been reported by the Study Team in the Progress Report (1), November 1995, some studies have been previously conducted by various parties, and the content of those study results more or less are relates to river water and land use management. Out of those studies, 14 studies relate closely to the study presently being done and can be used as references, namely which pertain to :

- (a) Flood Control and Water Resources Drainage
 - (1) Master Plan for Drainage and Flood Control of Jakarta (1973).
 - (2) Cisadane-Jakarta-Cibeet Water Resources Development Plan (1979).
 - (3) Cisadane-Jakarta-Cibeet Water Resources Development Plan, Complementary Report (1980).
 - (4) Cengkareng Drain System Study (1981).
 - (5) Study Report on East Java Flood Control Project (1985).
 - (6) West Jakarta Flood Control System Project (1986).
 - (7) The Study on Urban Drainage and Wastewater Disposal Project in the City of Jakarta (1991).
 - (8) Water Quality Control Management in Jabotabek (1991).
 - (9) Jabotabek Water Resources Management Study (1994).
 - (10) The Study on Ciujung-Cidurian Integrated Water Resources (1995).
- (b) Land Use
 - (1) Jabotabek Metropolitan Development Plan Review (1993).
 - (2) Urban Fringe Area Planning Studies (1993).
 - (3) DKI Jakarta Master Plan (Jakarta 2005).
 - (4) Land Use Planning Map (Bekasi, Tangerang, Bogor).

From the institution viewpoint it can be concluded that those studies have not yet fulfill the requirements determined by the prevailing legislation. It can be understood because the implementing regulation such as Ministerial Regulation of MPW No. 67/1993 has not been enacted until 2 December 1993, and its implementation has not been conducted until 1995. So is the case of Ministerial Regulation of MPW No. 39/PRT/1989 on Division of River Basins, it has not been enacted until 1 April 1989. Ministerial Regulation of MPW No.

48/PRT/1990 on Management of Water and Water Source in River Basins has not been enacted until 5 December 1990, while Government Regulation No. 35/1991 on Rivers was issued on 14 June 1991.

6.2. Flood Control Master Plan of Cisadane - Ciliwung River Basin

It appears that the study conducted by the Study Team has been given direction to follow provisions stipulated in the legislation as depicted above, among other pertaining to river basin approach, although project approach (engineering oriented) is still apparent. From the viewpoint of institution, Law No. 11/1974 stipulates provision pertaining to Planning, i.e. consisting of :

- (1) Water Resources Management Plan (WRMP).
- (2) Water Resources Plan (WRP).
- (3) Water Resources Development Plan (WRDP).

By the understanding that the flood control master plan is part of river basin development master plan, so in the formulation of provision of Law No. 11/1974, through engineering approach, Flood Control Master Plan must become part of Water Resources Development Plan, and afterward it become part of Water Resources Plan. It is of necessity that the provisions in the said Law have to be followed consistently.

Through administrative approach, flood control master plan must also follow provisions determined in the related legislation, among other it is necessary to follow the basic principles i.e. public utility, harmony and conservation. As an example, in order to give its greatest benefits, the available water has to be regulated for the optimum use, and not to be channeled quickly to the sea. With respect to flood control, the following 4 philosophical message are introduced :

- (a) Keep the people away from the flood.
- (b) Collect the flood water in reservoir for further arrangement of its utilization.
- (c) Give sufficient route for flood flow.
- (d) Place the flood water in reserved basin before flowing to the sea.

It is hoped that the formulation of the Study Team which has been adopted in the Flood Control Master Plan can fulfill the message as depicted above. As it has been shown in Figure 2, the legalization procedure of a Planning or Study Formulation, in line with the provisions stipulated in legislation and its implementation guidelines has to be acquired

through discussion conducted in the Provincial Water Management Committee. With respect to Cisadane - Ciliwung River Basin which is located in two Provinces, it can use the procedure as regulated in Ministerial Regulation of MPW No. 67/PRT/1993, Article 10.

6.3. Feasibility Study

In accordance with the technical assistance program of JICA, after the Flood Control Master Plan has been accordingly prepared and agreed upon, then it is followed by Feasibility Study on the projects formulated in the said Master Plan (8 project groups). From the viewpoint of institution, the agreement and legalization processes of a study result, have to be in line with the procedures as depicted through Figure 2 (coordination pattern).

It is hoped that with the legalization of study result through this procedure, the concerned agencies (members of Water Management Committee) can adjust their respective programs and act as partners in any stage of implementation of the development.

6.4. Ground Water

Although matters on condition of ground water have been paid attention to the study, by using formulation of the study result conducted by JWRMS (Jabotabek Water Resources Management Study), apparently it does not make great influence on flood control problems. Matter which must be paid attention to is the occurrence of land subsidence in various area of DKI Jakarta.

Problems on ground water in Cisadane - Ciliwung river basin are closely related to the coverage of water supply for urban purposes and industry. Study on ground water and ground water management has to be integrated with surface water management as it has been formulated in the document of Water Resources Development and Management (WRDM) Policy and Strategy (result of international seminar in Cisarua, Bogor, October - November 1992), in particular point 3 (the document is attached as Appendix No. 1).

Although at present an overall Master Plan on Development of Cisadane - Ciliwung River Basin has not yet been prepared or it does not yet fulfill the mission stipulated in Law No. 11/1974 in particular Paragraph IV Planning and Technical Design, Article 8 and 9, because of various limitation, however it is expected that in the future, when encouraged by emergence of "political will" from those who are responsible for water resources institutional order, the matter will be dealt with accordingly.

7. FLOOD CONTROL INSTITUTION

7.1. Implementation Unit of Ciliwung - Cisadane River Basin Development Main Project.

In the framework of enhancing water and water source development system, by taking into consideration provisions which have been stipulated in the related legislation, the capability of Project Implementation Unit which previously has the responsibility to deal with flood in DKI Jakarta area and its surrounding, is strengthened and developed in order to be able to deal with task which is broader and more extensive.

By using institutional approach, its development process can be followed as follows :

- (i) Jakarta as Capital of the State must be freed from flood or at least the flood which hits the city can be controlled. Heavy flood which had attracted special attention of the Government occurred in 1964. Afterward the Central Government had established task unit with the responsibility to conduct activities with respect to flood control/prevention of Jakarta city called the Jakarta Flood Control Project Command.
- (ii) When PELITA I was initiated, the task of flood control of Jakarta city had been implemented by the Implementation Unit of Jakarta Flood Control Project.
- (iii) Because problems of flood control are becoming more and more complex due to the rapid growth/development of Jakarta and its surrounding, it is apparent that the flood which occurs every year can not yet be controlled properly. Flood control pattern can not yet be solidly prepared. Various studies have been conducted since 1973 with the technical assistance from several countries and foreign aids agencies. Although the pattern used is still individual project approach, but steps pertaining to control efforts are more directed based on related study results. As it has been discussed earlier, it can be seen that study/planning which has been conducted since 1973 until now is still using individual approach, in the sense that it is not yet "integrated" following the approach pattern of river basin development.
- (iv) With the issuance of Ministerial Regulation of MPW No. 39/PRT/1989 on Division of River Basins and No. 48/PRT/1990 on Water and Water Source Management in River Basins, the Implementation Unit Flood Control Main Project for Jakarta

Raya and its Surrounding, based on the Decree of Director General of Water Resources No. 26/KPTS/A/1992, dated 23 March 1992, developed to become The Implementation Unit of Ciliwung - Cisadane River Basin Development Main Project (hereinafter called the Project).

The main tasks of the Project are :

- (1) To implement general planning and engineering design in the framework of overall and integrated management of water and water source which among other relates to rivers in Cisadane - Ciliwung River Basin and to prepare short-term, mid-term and long-term implementation programs.
- (2) To implement physical development in the framework of water and water source management, mainly which relates to rivers in Cisadane - Ciliwung River Basin.
- (3) To implement exploitation and maintenance activities of river and river structure.

Division of task in the field is conducted through sub river basin pattern, namely with the establishment of Cisadane River Project, Ciliwung River Project and Bekasi River Project.

- (v) Afterward, in parallel with policy and strategy development in the scope of development and management of water resources, they are being clarified in the following operational activities :

- development and conservation programs of water resources;
- supply and development programs of raw water;
- management program of river, lake and other water sources;
- development and management programs of irrigation networks;
- other programs which are developed in line with the river basin condition and its elements.

In parallel with the issuance of Ministerial Decree of MPW No. 211/KPTS/1994 on Organization and Management of Ministry of Public Works which determines structural changes of Directorate General of Water Resources as seen in figure no. 1, the Decree of Director General of Water Resources No. 28/KPTS/A/1994 has reorganized the Implementation Unit of Cisadane - Ciliwung River Basin Development Main Project.

The main task of The Project are developed as below :

- (1) To conduct activities pertaining to survey, study and planning to support the achievement of development enhancement with respect to water source potential in Ciliwung - Cisadane River Basin, for the purposes of flood control, agriculture, raw water supply for domestic household, industry and other fields of development.
- (2) To conduct activities pertaining to construction of flood control structure, drainage networks and other water resources structures in the framework of development of Ciliwung - Cisadane River Basin.
- (3) To conduct activities pertaining to preparation and supervision of operation and maintenance in respect of complete constructed structures prior to the transfer to authorized institution/agency.
- (4) To conduct coordination and cooperation with other agency which is related to its task.
- (5) To conduct administration for the accomplishment the scope of task in the effort to develop the project management.

Note :

It seems, already adjusted to the provisions stipulated in Ministerial Regulation of MPW No. 67/PRT/1993 (refer to Figure 2)

Division of task in field is done through functional pattern, and in accordance with the condition of river basin, then the following projects are established :

- Water Source Management and Flood Control Project.
- Water Source Development and Conservation Project.

7.2. Interrelation of Task within The Directorate General of Water Resources

- (i) In accordance with task regulation pattern which is prepared based on functional approach, the working relationship of task between the Project and Directorate General of Water Resources is also implemented by functional pattern. It can be clarified as follows :
 - (a) In accordance with strata/level pattern of Project Implementation Units, a Main Project with a task area extent of a River Basin (territory) is directly under the

command of Director General of Water Resources. So is the case, the Ciliwung - Cisadane River Basin Development Main Project is under the direct command of the Director General of Water Resources. However, for day to day management and supervision, the Director General has authorized the Director of Implementation Guidance Central Region mainly for field operation activities such as construction works, cooperation with agencies in the Region and so on.

- (b) The Directorate of Water Resources Management and Conservation is in charge for supervision and guidance on data collecting, survey, study, investigation, master plan formulation, feasibility study.
- (c) The Directorate of Technical Guidance gives guidance and supervision to the Project in the formulation activity of engineering design.
- (d) The Directorate of Planning and Programming will give guidance to the Project in respect of program arrangement, determination of development implementation priority and funding arrangement.

The interrelationship of task between the Project and Directorate General of Water Resources is illustrated in a scheme as seen in figure no. 3.

- (ii) In accordance with the scope of its main task as mentioned in chapter 7, para 7.1.(v) point (4), the Project has the duty to make coordination and cooperation with other agencies in Regional level and Central level, as well as with private sectors and community, for the sake of the smoothness of its task implementation. If it is deemed necessary, to the Project can ask for assistance or support from Directorate General of Water Resources - Directorate of Implementation Guidance Central Region.
- (iii) In the framework to implement provisions stipulated in the prevailing legislation, the Project has to develop coordination mechanism as depicted in Figure 2, in line with what has been discussed in chapter 3 para 3.4. When arrangements as stipulated in the Ministerial Regulation of MPW No. 67/PRT/1993 on Water Resources Management in Provincial Government Level I have not yet been completely developed in DKI Jakarta, it is of particular importance to make effort that water resources development planning and programming acquires approval and support from all agencies concerned (main of the Project no. 4).

Meeting on discussion of study result of the Study Team had been held some time ago by the Directorate General of Water Resources. The Directorate of Water Resources

Management and Conservation had invited various related agencies and it can be considered as technical discussion stage. In order that may is not in contradictory with the provisions stipulated in the prevailing legislations and their implementing regulations, the planning and program which have been formulated by the Study Team need approval and legalization through discussion in the forum of Water Resources Management Committee, and chaired by the Head of Regional Government.

With regard to DKI Jakarta, as the Water Resources Management Committee has not yet been established, discussion to obtain approval/agreement and legalization of planning and programming can be done in a special meeting or by using Development Cooperation Board of JABOTABEK which is formed through Joint Regulation between Provincial Government Level I of West Java and DKI Jakarta :

Number 5 year 1990
 2 year 1990

It is apparent that the most important issue, is the approval and legalization of the development planning and program by the Head of Regional Government and further legalized and determined by the Minister of Public Works as foundation to implement construction and continued with operation and maintenance by the respective and responsible agencies.

7.3. Ciliwung - Cisadane River Basin Management

Based on the Ministerial Regulation of MPW No. 39/PRT/1989, all rivers in Indonesia are grouped in 90 river basin units. Ministerial Regulation of MPW No. 48/PRT/1990 stipulates the following matters :

- (a) Management of water and water sources in a river basin unit (river territory) located in a Region/Province is delegated to the related Provincial Government in the framework of co-administration, covering 73 river territory.
- (b) Management of water and water sources in a river territory located in more than one Region/Province is still kept by the Minister of Public Works, covering 15 river basin units.
- (c) Government Regulation No. 5 year 1990 stipulates that the management of water and water sources of rivers flowing in Kali Brantas River Basin - East Java, is conducted by State Public Corporation (PERUM) Jasa Tirta, located in Malang.
- (d) Government Regulation No. 42 year 1990 stipulates that the management of water and water sources of rivers flowing in Citarum River Basin - West Java, is

conducted by State Public Corporation (PERUM) Otorita Jatiluhur, located in Jatiluhur, Purwakarta.

Ciliwung - Cisadane River Basin, located in 2 Provinces, DKI Jakarta and West Java, is grouped in category (b), i.e. the management of water and water sources is kept by the Minister and the day to day management is conducted by Director General of Water Resources.

7.4. Institution Development

- (i) As it has been discussed earlier, there is a development of institution pertaining to Project Implementation Unit which is previously only dealing with flood in Jakarta, now it becomes Project Implementation Unit of Ciliwung - Cisadane River Basin Development demanded by the advanced mission which is synchronized with the condition of social and economic development of the people.

It is apparent that from the viewpoint of legislation such development is the implementation stages of Law No. 11/ 1974 and its implementing regulation, as is in fact, realized in the form of organization and its task.

The organization structure of Main Project of Ciliwung - Cisadane River Basin Development consists of Water Source Development and Flood Control Project, Water Source Development and Conservation Project, and in other main project units, there are Irrigation Project, Raw Water Supply Project, Coastal Plain Pacification Project, and so on which indicate development of activities based on water resources management pattern which has the basic principles of public utility, harmony and conservation and taking into consideration the existence of elements of river basin.

- (ii) Nowadays it is apparent that problems of water resources in JABOTABEK area in general, and the capital of Jakarta in particular, are becoming more and more complex which should be paid attention properly.

Problems in respect of flood, ground water, raw water supply, clean water supply, water pollution, water source conservation, control of water penetration area, control of coast and coastal plain have emerged from one to another and often simultaneously, which have interfered the living and prosperity of the community.

Efforts to overcome every problems have been carried out seriously, either by the Government and the community, but programs which are based on overall and integrated plan, still has to be developed.

The strategy on formulation the overall and integrated plan mentioned above, can be derived from the plan prepared for institution development, without slowing down the speed of development being implemented or being programmed.

(iii) The institution development planning, has to be done based on the provisions stipulated in the prevailing legislation. The direction of the development can be implemented by stages as follows :

(a) The cooperative activities is still can be improved through a more closer coordination approach, either relating to planning, construction, exploitation and maintenance aspects and the involvement and participation aspect of the community with the Local Government, within the procedural pattern, which is illustrated in figure no. 2.

(b) Preparation of an overall and integrated Water Resources Development Master plan, has to follow the legalized coordination pattern (figure no. 2).

(c) Conduct institution study, as a preparatory steps, prior to the selection of direction which has to be used for the development of institution.

(d) Before deciding the type of institution which is being selected, a intermediate step can be taken, for example :

- to delegate, on behalf of the DGWRD, to PIPWS Ciliwung - Cisadane, to be responsible for the management of particular aspect (for instance, formulation of Master plan).

- the PIPWS Ciliwung - Cisadane is entrusted to function as Head of Technical Implementation Unit which is established based on the Ministerial Decree of State Agencies Management No. 106/1994 (for Water Resources Public Services, Water Resources Preservation and Conservation Agency).

(e) If the study as mentioned in point (c) above resulted that a State Corporation type is feasible and viable, the establishment of such corporation, which has the authority and responsibility as stipulated in the Government Regulation No. 35/1991 on Rivers, can be proposed. The establishment of the corporation has to be done by issuance of a government regulation.

(f) If then the case that the type of institution is chosen as describe in point (e) above, it may be preferable to enlarge the scope of work of Jasa Tirta State

Corporation (establishment by Government Regulation No. 5/1990), by issuing a Presidential Decree especially related to Art. 8 sect. (2) of Government Regulation No. 5/1990.

The steps which has to be taken, are as follows :

- (1) Hopefully that the MPW is willing to deliver a proposal to the President, to readjust and enlarge the number of rivers which becomes under the management of Jasa Tirta State Corporation, with the argument, to simplify the system of management for rivers and take into consideration the system which is adopted by Ministerial Decrees of MPW No. 39/PRT/1989 and No. 48/PRT/1990.
- (2) Has to be covered in the proposal to the President, that Sub Units or Branches should be established, namely are Unit I Brantas and Unit II Ciliwung - Cisadane, respectively has the authority and responsibility of the management of water resources in Brantas River Basin and Ciliwung - Cisadane River Basin.

The offices are located :

- for the Main Office : still in Malang or move to Jakarta.
- for Unit I Brantas : in Malang.
- for Unit II Cil - Cis : in Bogor (constructed together with the construction of Bogor tunnel).

Notes :

as reference related to point (f), please read the Report of JIAS Advisor (JABOTABEK Institutional Advisory Services, Sub Component of JWRMS - JABOTABEK Water Resources Management Study, a project under JUDP II - JABOTABEK Urban Development II) prepared in October 1992. It is hereby attached, the quotation of that report, particularly which is related to Jasa Tirta State Corporation and Otorita Jatiluhur State Corporation for clarity (see appendix No. 2).

- (g) Additional explanation to point (f) is illustrated in figure No. 4, including the estimated time framework for the development process of the related institution building.

8. OTHERS

8.1. Water Resources Management in Province

- (i) Water resources management in the Province of West Java is conducted by Public Works Provincial Water Resources Service/Dinas of West Java. In DKI Jakarta, water resources management is conducted by Sub Dinas of Water Management, Public Works Provincial Service/Dinas of DKI Jakarta. Problems on water resources which arise are brought to Coordination Meeting of Development Cooperation Board to be discussed and formulated how to solve them.

Taking into consideration the result of coordination meeting of the Development Cooperation Board, the respective Governor determines guidance and provisions in dealing with the problems.

- (ii) In the framework to enhance development program of regional autonomy, at present based on the Ministerial Decree Minister of Home Affairs No. 80 year 1994 pertaining to Guidelines on Organization and Management of Regional Public Works Service, the pilot stage of guidance to develop organization in Regional Government Level II has been initiated. Water resources management in Regional Government Level II will be conducted by District Water Resources Service (Dinas Pengairan Kabupaten).

- (iii) From the viewpoint of institution, it is felt that special study for Jabotabek area needs to be conducted to formulate method how to manage the water resources in proper and harmonious way considering that water resources institution in DKI Jakarta differs from West Java Province.

From the viewpoint of water resources management, special investigation also needs to be conducted, judging that :

- (a) The need of water resources in Jabotabek is served by 3 river basin units, i.e. :
- Ciliwung - Cisadane River Basin
 - Citarum River Basin
 - Ciujung - Ciliman River Basin

- (b) Water Resources potentials in Citarum and Ciujung - Ciliman River Basins are demanded to serve the needs of the communities in their respective areas.

Progress of development in these two areas is rapidly advancing such as industrial areas in Cilegon, Krawang - Cikampek, South of Bandung, etc.

8.2. Land for River Structures

As reported by the Study Team, the flood control infrastructures proposed consist of river improvement works, improvement/rehabilitation of weirs, construction of reservoirs, floodways, tunnels, which needs a certain area of land, either for the purpose of construction space of river structure and for the purpose to set-up the river area, for management facilities (offices, officials houses, and others). For straightened the course of river by constructing new river channel needs an area of land, but gain an area of land, that is the course of the old river.

Within the scope of the arrangement of providing land for the purpose of river projects the Minister issued the Ministerial Regulation of MPW No. 63/PRT/1993 on River borderline, Flood Plain, River Area, River Authorized Area and Former River Site, dated 27 February 1993.

For river basins which are still under the management of the Minister, the sequential legal arrangement is under the Director General of Water Resources. For river basins which are under the management of Provincial Government and State Corporation the sequential legal arrangement will be implemented by the related Governor Head of Region Level I. If within the scope of handling of such land, emerge problems which can not be solved by Public Works - Water Resources Agency, should be discussed and formulated based on the procedures stipulated in Ministerial Regulation of MPW No. 67/PRT/1993 (see figure No. 2).

8.3. Sand Mining

In the next future, due to the rapid development of infrastructures in various sectors, the demand of sand is increasing. To get sand, people looking for sand quarry among others sand deposit in the river channel.

Sand mining done by various parties, mainly private companies, has to be controlled, otherwise may destroy the river structure. The Minister of PW issued the Ministerial Decree No. 458/KPTS/1986 on Provisions for River Pacification in relation with the Mining of Excavation Materials Group C.

In the scope of flood control master plan study, it seems that a particular study on sand mining in rivers, may not necessary. But as for feasibility study, it has to be take in to consideration and to be studied in detail, for the purpose of the preparation of infrastructure and means for controlling the sand mining, within the scope of flood control structures protection.

8.4. Construction of River Structures

Flood control structures and infrastructures proposed by the Study Team which have to be constructed, among other contains of floodways and river channel improvement. There are possibilities, that the construction of those channels will cross or connected to other structures, such as road, railway, gas-pipeline, oil pipeline, cable network for telephone, electricity and others. It needs a regulatory arrangement, to keep those infrastructures in function perpetually.

In the Government Regulation no. 35/1991 on rivers, provisions relating to construction, destruction, renovation of structures crossing or stand in the river area, are stipulated.

Up to this moment, sequential legislation for implementation has not been issued yet. If problems may emerge relating to respective cases, effort for solving problems can be processed through the Ministerial Regulation of MPW No. 67/PRT/1993 (see figure no. 2).

9. CONCLUSIONS AND SUGGESTIONS

From the above mentioned depiction, the following conclusions and suggestions can be forwarded :

9.1. Conclusions

As formulation of conclusions, particularly matters, which has to be take in to consideration by authorities concerned, among others are as follows

- (i) Several studies on water resources aspects have been previously conducted partially with various approaches, however they are not done in overall and integrated approach.
- (ii) In 1993, new Policy and Strategy on Water Resources Development and Management had been formulated and entering for implementation, which basically

are based on prevailing legislations, mainly Law No. 11/1974 on Water Resources.

- (iii) Study on Comprehensive River Water Management Plan in Jabotabek is focused on preparation of Flood Control Master Plan. In conducting the study, previous study results mentioned in point (i) above are used as reference.
- (iv) As further step of the study mentioned in point (iii) above, Feasibility Study on development projects as formulated by of the study, which consists of 8 groups of flood control system in Ciliwung - Cisadane River Basin, will be carried out.
- (v) From the viewpoint of institution, various development and management of water resources including activities of flood control, are not yet fully based on provisions stipulated in the prevailing legislation, either relating to engineering aspects (planning, construction, operation and maintenance) and administration aspects (management and organizational arrangement of the related agencies).
- (vi) To be able to manage water resources in Ciliwung - Cisadane River Basin in a proper manner, the management institution has to be strengthened step by step in conformity with the speed of the development, but still to be in line with the provisions stipulated in prevailing legislation.

9.2. Suggestions

In order that a solid and proper system pertaining to Water Resources Development and Management can be implemented in the future, it is suggested to make effort synchronizing in to the system gradually which demanded by the mission stipulated in prevailing legislation, as follows :

- (i) It is expected that each agency of which task and activity are related to water resources will together synchronize its task implementation system to be in conformity with the procedure which is based on the prevailing legislation. In order to understand and obey the prevailing legislation, all together and in a good coordination approach, public awareness campaign has to be conducted.
- (ii) From the study results performed by various agencies according to their respective approaches and interests, it is of particular importance that they need to be integrated to become an overall and integrated Master Plan pertaining to Development and Management of Water Resources which is mutually approved

and legalized and can be used as foundation of task implementation in their respective fields.

Efforts are made based on provisions as regulated and determined by existing legislation, mainly Law No. 11/1974, Government Regulation No. 22/1982 (in particular section (1) and section (2) of Article 11).

- (iii) It is expected that studies which will be further performed, in their inception stages have to integrate previous study results to be formulated as overall and integrated Master Plan in respect of Development and Management of Water Resources. The following stage is to conduct study review, so that the Master Plan can always in conformity with environmental development and its advancement.

9.3. Note

Copies of legislation mentioned in this report are not attached, however type, number and title are depicted in a list as attachment no. 4.

